

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

SIMON KUZNETS KHARKIV NATIONAL UNIVERSITY OF ECONOMICS

**Web Analytics for Business
Guidelines to laboratory work
for Bachelor's (first) degree
students of all specialities**

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Guidelines for the performance of laboratory work are presented to consolidate and deepen the knowledge of theoretical and practical material, to acquire web-analytics skills with the help of modern web resources.

For Bachelor's (first) degree students of all specialities.

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Introduction

In the modern conditions of the development of the digital society, the importance of web analytics is increasing as a system for collecting, analyzing and interpreting statistical information about visitors to the sites of various business structures in order to identify and understand the reasons for their actions and further optimize their activities.

The academic discipline is aimed at mastering modern digital practices and technologies for working with information, effective web analytics tools, understanding that analytics is a key skill in business product management. In the process of studying the academic discipline, there is a practical assimilation of the methodology of the Internet search optimization, which involves clarifying the essence, content, purpose and tasks of web analytics, mastering the methodological tools for measuring and analyzing web data in order to make decisions aimed at the optimization of the use of web tools by business structures.

The goal of the academic discipline is to acquire theoretical knowledge and practical skills on the basics of web analysis of various web resources in order to evaluate their effectiveness and optimize business activities.

The acquisition of such knowledge and skills is aimed at performing laboratory work, which involves solving specific practical tasks taking into account the theoretical material taught in lectures.

The basis for mastering the academic discipline is the methods mastered in such academic disciplines as "Statistics", "Informatics", "Macroeconomics", "Microeconomics" and other academic disciplines of professional training of bachelors in educational programs of various specialities.

The laboratory workshop on the academic discipline provides guidelines and tasks for students to perform laboratory work on the topics of the academic discipline.

Laboratory classes are a tool for students to acquire professional competences regarding:

- conducting comprehensive analytics of various information based on the use of statistical and web analytics tools;

- using Google Analytics as a digital search tool;

- drawing up substantiated analytical reports based on the results of web analysis;

- creation and configuration of Google Sites;

use of Google tools for analysis and visualization of conclusions;
use of web analytics tools in small business and social networks.

In addition, the performance of laboratory tasks involves the formation of students' communicative competences, such as teamwork skills and the development of a group solution; team management skills to achieve the set goal; creative thinking when solving tasks; tolerant attitude to other opinions, etc.

Content module 1. Introduction to web analytics

Topic 1. Introduction to web analytics

Laboratory work 1. Analytical tools in business evaluation

The goal is to deepen the practical skills of using statistical tools in the assessment of any type of business.

Tasks

1. Each student should choose any type of business and analyze it according to Internet resources. Calculations should be carried out using the MS Excel software application.
2. Consider the stages of conducting an A/B test. Analyze various situations for the groups being tested. Use the online calculator to calculate the required sample size and test duration.
3. Create a report on laboratory work in the form of an analytical reference.

Guidelines

In the analytical reference (approximately 5–6 pages), show the results of the analysis in the form of tables and graphs. Give conclusions based on each of the performed calculations. Provide a general conclusion on 1 page regarding the state and development prospects of the type of business chosen for analysis.

When performing the task, it is advisable to use the following analytical methods: grouping, descriptive statistics, relative indicators, dynamic analysis, benchmarking, visualization methods, A/B testing, etc.

Let's consider the essence of these methods in more detail.

Data analysis can have many aspects and approaches, be implemented with the help of various statistical tools, various visualization methods, but its primary task is the compression of information by grouping it.

To carry out grouping by means of MS Excel, the Data Analysis add-on, the Grouping analysis tool is used. So, for example, it is necessary to group the regions of the country according to the number of companies working in a certain type of activity. The raw data and grouping results are shown in Fig. 1.

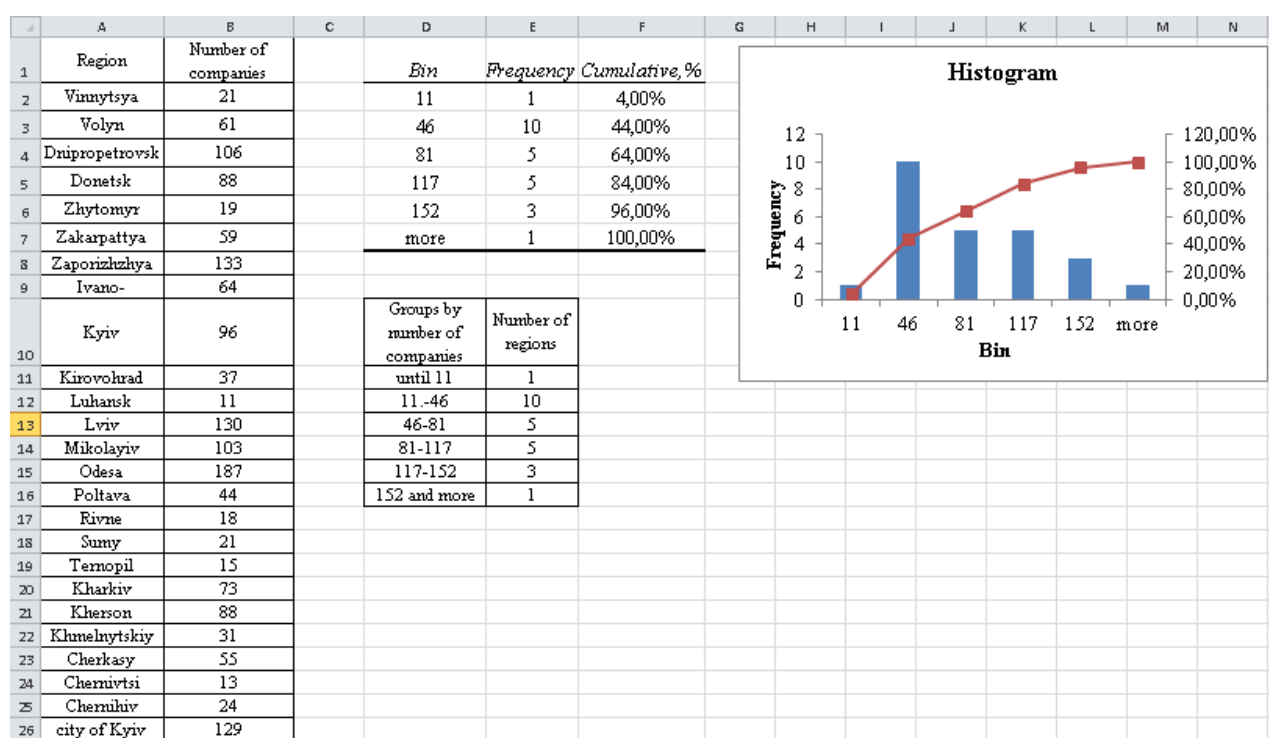


Fig. 1. Grouping of regions according to the number of companies of a certain type of business operating in the region

Thus, according to the obtained grouping results, 6 intervals (groups) were obtained. The distribution of regions of the country based on the number of companies of a certain type of business is not uniform, so the largest number of regions (10) is concentrated in the 2nd interval, i.e. where the number of companies ranges from 11 to 46, i.e. 40 % of all companies are concentrated in 10 regions of the country, and 15 other regions account for 60 % of companies. In general, 44 % of regions have the number of companies of a certain type of business up to 46 units, only one region of the country has the maximum number of companies (152 and more).

Common analytical indicators are indicators of descriptive statistics. Based on the use of MS Excel functions Mode, Median, Standard deviation, Average value, calculation of the coefficient of variation, use of the Data analysis add-on, the Descriptive statistics analysis tool, the following results can be obtained, Fig. 2.

H7		fx		=H6/H5*100				
	A	B	C	D	E	F	G	H
1	Region	Number of companies		<i>Indicators of descriptive statistics</i>				
2	Vynnytsya	21						
3	Volyn	61		Average value	65,04		Mode	21
4	Dnipropetrovsk	106		Standard error	9,45		Median	59
5	Donetsk	88		Median	59,00		Average value	65,04
6	Zhytomyr	19		Mode	21,00		Standard deviation	47,2445
7	Zakarpattya	59		Standard deviation	47,24		Coefficient of variation,%	72,6391
8	Zaporizhzhya	133		Sampling variance	2232,04			
9	Ivano-Frankivsk	64		Excess	0,10			
10	Kyiv	96		Asymmetry	0,82			
11	Kirovohrad	37		Interval	176,00			
12	Luhansk	11		Minimum	11,00			
13	Lviv	130		Maximum	187,00			
14	Mikolayiv	103		Sum	1626,00			
15	Odesa	187		Account	25,00			
16	Poltava	44		Largest (1)	187,00			
17	Rivne	18		Least (1)	11,00			
18	Sumy	21		Reliability level (95%)	19,50			
19	Ternopil	15						
20	Kharkiv	73						
21	Kherson	88						
22	Khmelnytskyi	31						

Fig. 2. The results of the calculation of the indicators of descriptive statistics

Let's consider the indicators of descriptive statistics in more detail. The most well-known measure of central tendency and the most used in everyday life is the *mean value*, or the simple mean, or the arithmetic mean. To calculate it, it is enough to add together all the values in the distribution and divide by the number of observations.

The general rules for using the average value are as follows:

the mean is the "center of gravity" of the distribution, and each value contributes to the definition of the mean when the distribution of values is symmetrical about the central point;

the mean is more stable than the median or mode. Therefore, when it is necessary to find the most stable measure of central tendency, then the average value is used.

Advantages of the average:

the mean is the most common measure of the central tendency because it is easy to understand;

the average is easily calculated;

the mean takes into account all values of the distribution.

Average limit:

the average value is affected by extreme values (the well-known ironic joke about the "average temperature in the hospital");

sometimes the mean is a value that is not present in the distribution.

The median is the value in a distribution series (an ordered set of values of a variable for different observations, such as from smallest to largest value) before which half of all values lie, and after which half of the values also lie. That is, the median is the value that divides the ordered series in half.

If the number of values is odd, then one of the values is taken, which is exactly in the center of the distribution. When there is an even number of values, the two central values are taken and their average is found.

The median is used in cases:

when you need to find the exact middle point on the way from the smallest value to the largest one;

when extreme values affect the mean, the median is the best measure of the central tendency;

when you want certain values to influence the central tendency, but all that is known about them is that they are "below" or "above" the median.

Advantages of the median:

it is easy to calculate and understand;

not all values in the distribution are needed to calculate the median;

extreme values of the distribution do not affect the median;

it can also be defined for "open" intervals.

Limitations of the median:

it is not as rigidly determined as the average value, since its value is not so much calculated as it is found (among the values in the distribution);

it ignores all observations (the value for all observations);

you cannot do algebraic transformations with the median as with the mean;

it requires the ordering of interval values or classes in ascending or descending order;

sometimes the median can be a value that is not present in the distribution itself.

A third measure of the central tendency is the *mode*, which is the value that occurs most often in the distribution. As a rule, it represents the most typical value. The mode is never affected by the extreme values in the distribution, but by the extreme frequencies of the values, how often this or that value of the variable occurs in the distribution.

The mode is used in the following cases:

when a quick and approximate measure of the central tendency is needed;

when a measure of the central tendency is required, which should be a typical value.

Advantages of the mode:

the mode shows the most common value in the distribution series;

the mode is not affected by extreme values, as the average is;

it can be defined for open intervals;

it helps analyze qualitative data;

the mode can be detected graphically based on the histogram.

Mode restrictions:

it does not include in the definition/calculation all observations of the distribution, but only the concentration of frequencies;

further algebraic transformations are impossible, unlike the average;

sometimes it is difficult to determine in the case of a multimodal or bimodal distribution.

A distribution may have more than two popular values, but if it has more than three modes, describing such a distribution in terms of the most frequent values may lose all meaning.

Standard deviation is an indicator of how "spread out" the values of a particular variable are in a data set, and it is measured in the same units as the variable. In a normal distribution, 68 % of the values are within one standard deviation of the mean (i.e. ± 1 standard deviation). Standard deviation is calculated as the square root of the variance.

Standard deviation provides insight into how well, for example, the mean represents the entire data set. If the spread of values in the distribution is large, then the mean is not as representative as if the data is spread out

little. That is, a large spread in the data means that there are probably large differences between the values.

To characterize the asymmetry, the *Pearson coefficient of asymmetry (asymmetry)* is used:

$$A_s = \frac{\bar{x} - Mo}{\sigma}. \quad (1)$$

In single-peaked distributions, the value of this indicator varies from -1 to +1.

In symmetric distributions $A_s = 0$. For $A_s > 0$, right-sided asymmetry is observed, for $A_s < 0$, the asymmetry is left-sided.

For single-peaked distributions, the *excess* is calculated as an indicator of its shape. The excess is an indicator of the sharp peak of the distribution. It is calculated for symmetric distributions based on the central moment of the 4th order:

$$E_x = \frac{\mu^4}{\sigma^4} - 3. \quad (2)$$

In a symmetric, close to normal distribution $E_x = 0$. Obviously, for the sharp-top distribution $E_x > 0$, for the flat-top distribution $E_x < 0$.

Thus, based on the results of the calculation of descriptive statistics indicators presented in Fig. 2, it can be concluded that the largest number of companies is located in the Odesa region (187 companies), and the smallest number is in the Luhansk region (11 companies). The trend shows that the most common number of companies among the country's regions is 21. The median indicates that half of the country's regions have up to 59 companies, and the other half have more than this value. The deviation around the average value of the number of companies in the country (65) is 47, which indicates that the regions of the country are heterogeneous in terms of the level of distribution of the number of companies of a certain type of business (the coefficient of variation is 72.64 %, which significantly exceeds the homogeneity criterion of 33 %).

When analyzing information to identify the structure, coordination, comparison, intensity, and dynamics of business processes, relative values are used:

1) structures that characterize the share (specific weight) of constituent parts of the aggregate in its total volume;

2) coordinations, which characterize the relationship of individual parts of the statistical population to each other;

3) comparisons, which represent the ratio of absolute indicators of the same name characterizing different objects or territories;

4) intensities that characterize the degree of spread of the investigated process or phenomenon and represent the ratio of the investigated indicator to the size of the environment inherent in it;

5) dynamics, which show the intensity of changes in the dynamics of the phenomenon and are calculated as the ratio of the value of the indicator in the reporting period to the value of the same indicator in the base (previous) period.

Analytical indicators of dynamics deserve special attention, which, in addition to the relative value of dynamics or growth rate, include absolute increment, increment rate, absolute value of 1 % increment, average dynamics indicators (average absolute increment, average growth rate, average increment rate). These indicators of the intensity of dynamics can be calculated by basic or chain methods, depending on the purpose of the study.

Benchmarking is a method of analysis and search for a standard or reference more economically efficient competitor enterprise to compare with one's own and to imitate its successful work methods. It is also a constant and systematic search and implementation of effective practices that should bring the business structure to a more perfect form, a tool for determining the position of the company in comparison with other similar companies, similar in size and/or type or field of activity.

Benchmarking focuses on asking why other companies are more successful. The content and purpose of benchmarking is to identify differences with an analogue, to identify the reasons for these differences, and to find opportunities for improving the benchmarking objects. Benchmarking requires access to certain information about competitors, without which it cannot be effective.

When using statistical information *visualization methods*, the following mistakes should be avoided:

- a) the vertical axis starts from zero or vice versa;
- b) the time axis does not reflect the integrity of the period;
- c) wrongly selected graph type;
- d) inappropriate use of 3D effects;
- e) poor or excessive design of the schedule;
- f) too many categories are located on the graph;
- g) incorrect arrangement of factor and result signs;
- h) unsynchronized axes for indicators with different measurement units;
- i) lack of emphasis on graphics;
- j) variability of parameters on graphs;
- k) distortion of information when using the "other" category;
- l) incorrect use of averaged data;
- m) lack of text annotations accompanying the image.

A/B testing is one of the tools of web analytics (product analytics), the essence of which is that a control group of elements is compared with a set of test groups where one or more indicators are changed in order to find out which of the changes improve the target indicator.

A/B testing steps:

1. Determination of the goal taking into account the priority of the effect on the target indicator. It is advisable not to run several *A/B* tests in parallel to understand exactly which of the new functionalities affected the target metric. For example, at the beginning *A/B* testing of a game is usually a priority Retention D1 – the proportion of players who returned the next day after installing (changing) the new functionality. At later stages, these can be retention or monetization metrics: conversion, average revenue per user (ARPU) and others.

Example 1. After the project reaches the soft launch, when the release of the product (game) and testing of its operation takes place on a limited market (audience), retention metrics require special attention. At this stage, one possible problem can be identified: Retention D1 does not reach the level of the company's benchmarks for a specific game genre. It is necessary to analyze the breakthrough of passing the first levels. Suppose you noticed a large gap (drop) of players between the start and completion of the 3rd level – a low Completion Rate of the 3rd level (Fig. 3).

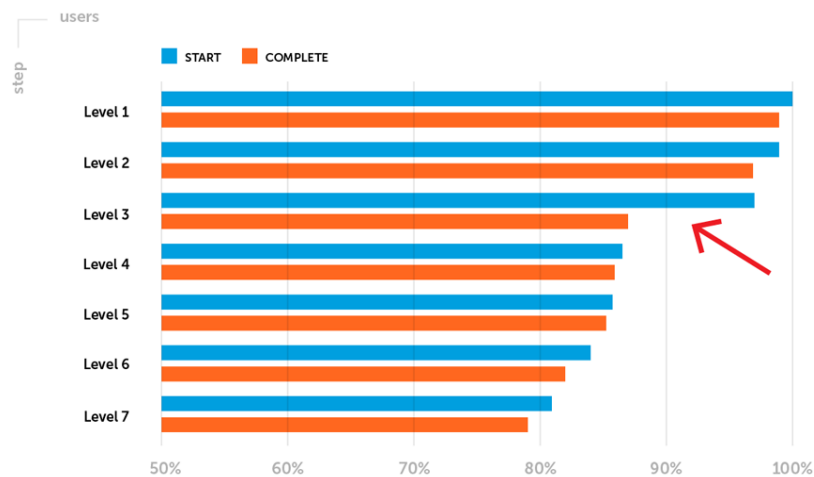


Fig. 3. An example of a gap between start and completion

The objective of the A/B test: to increase Retention D1 by increasing the proportion of players who successfully complete level 3.

2. Definition of the metric.

Before starting an A/B test, it is necessary to determine the monitored parameter, that is, choose a metric whose changes will show whether the new (updated) functionality is more successful than the original one.

There are two types of metrics:

quantitative – average session duration, average check size, level completion time, amount of experience, etc.;

qualitative – Retention, Conversion Rate and others.

The type of metric affects the choice of method and tools for evaluating the significance of results.

It is likely that the functionality being tested will affect not one target, but a number of metrics. Therefore, it is necessary to look at the changes in general, but not to try to find "at least something" when there is no statistical significance in the assessment of the target metric.

As an example, in accordance with the goal from the first step, for the future A/B test, we will evaluate the Completion Rate of the 3rd level – a quality metric.

3. Formulation of the hypothesis.

Each A/B test tests one general hypothesis, which is formulated before launch based on the answer to the question: What changes are expected in the test group? The wording of the question usually looks like this: "We expect (influence) to cause (change)".

Statistical methods work in reverse – we cannot prove that the hypothesis is correct with their help, therefore, after formulating the general hypothesis, two statistical ones are determined. They help to understand whether the difference between control group A and test group B is due to chance or the result of variation.

In Example 1: The null hypothesis (H0) is that reducing the difficulty of level 3 will not affect the proportion of users who successfully complete level 3. Level 3 Completion Rate for groups A and B are not really different and the observed differences are random.

Alternative hypothesis (H1): decreasing the difficulty of level 3 will increase the proportion of users who successfully complete level 3. The Level 3 Completion Rate of Group B is higher than that of Group A, and these differences are the result of changes.

At this stage, in addition to the formulation of the hypothesis, it is necessary to evaluate the expected effect.

Hypothesis: "We expect that a decrease in the difficulty of the 3rd level will cause an increase in the Completion Rate of the 3rd level from 85 % to 95 %, that is, by more than 11 %" $((95 \% - 85 \%) / 85 \% = 0.117 = > 11.7 \%)$.

In Example 1, to determine the expected Completion Rate of the 3rd level, we aim to approximate it to the average value of the Completion Rate of the initial levels.

4. Setting up the experiment. For this:

a) a parameter for A/B groups is determined before starting the experiment: for which audience is the test launched, for what proportion of players, what settings are set in each group;

b) the representativeness of the sample as a whole and the homogeneity of the samples in the groups are checked. You can pre-run an A/A test to evaluate these parameters – a test in which the test and control groups have the same functionality. An A/A test helps ensure that there are no statistically significant differences between the two groups in the target metrics. If there are differences, you cannot run an A/B test with these settings – sample size and confidence level.

The sample will not be perfectly representative, but we always pay attention to the structure of users in terms of their characteristics – new/old user, country, etc. It is important that the structure of users of each group is conditionally the same.

There are two potentially dangerous points here:

high metrics in groups during the experiment may be the result of attracting good traffic. Traffic is good if engagement rates are high. Bad traffic is the most common cause of falling metrics;

heterogeneity of the sample. Suppose the project from our example is developed for an English-speaking audience. Therefore, we need to avoid a situation where more users from countries where the English language is not predominant will be included in one of the groups (Fig. 4).



Fig. 4. An example of the heterogeneity of the sample before the A/B test

c) the volume of the sample and the duration of the experiment are calculated. Various online calculators are used for this step (Fig. 5).

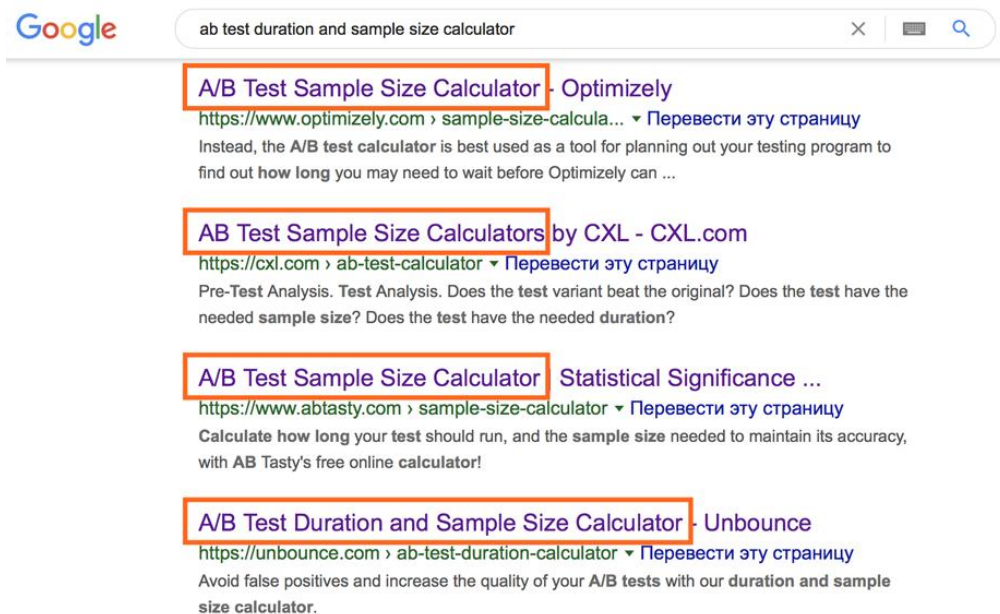


Fig. 5. Examples of online calculators

The use of online calculators involves the introduction of specific initial information and statistical categories. Let's consider them in more detail.

The general population is all users to whom the conclusions of the A/B test will be distributed in the future.

The sample is the users who actually get tested. Based on the results of the sample analysis, conclusions are drawn regarding the behavior of the entire general population.

We would expect to see the baseline conversion rate in the control group. To evaluate this indicator, historical data is taken – the average indicator for the last month, but not only the average value is taken into account, but also the dynamics of the indicator, the trend, etc.

We expect to see the size of the effect in the test group. This indicator is determined independently and must be discussed before starting the experiment.

The level of statistical significance (α) is the probability of assuming an error of the first kind, that is, rejecting the null hypothesis (H_0) when it is actually true.

The confidence level ($1 - \alpha$) is the percentage of confidence that the test results are correct if it showed a difference.

The power of the criterion is the percentage of confidence that the results of the test are correct if it did not show a difference.

The set of these parameters allows you to calculate the required sample size of each group and the duration of the test.

In the online calculator, you can change the input data to understand the nature of their relationships.

For example, using the Optimizely calculator, we will calculate the sample size of the conversion rate of 1 %. Consider that the estimated effect size will be 5 % at a 95 % confidence level (the indicator is calculated as $1 - \alpha$). Please note: in the interface of this calculator, the term *Statistical significance* is used in the meaning of "Confidence Level" at a significance level of 5 % (Fig. 6).

<p>Baseline Conversion Rate</p> <input style="width: 60px; height: 25px; border: 1px solid #ccc;" type="text" value="1"/> %	<p>Your control group's expected conversion rate. [?]</p>
<p>Minimum Detectable Effect</p> <input style="width: 60px; height: 25px; border: 1px solid #ccc;" type="text" value="5"/> %	<p>The minimum relative change in conversion rate you would like to be able to detect. [?]</p>
<p>Statistical Significance</p> <p style="font-size: 1.2em; margin: 0;">95%</p> <p>EDIT</p>	<p>95% is an accepted standard for statistical significance, although Optimizely allows you to set your own threshold for significance based on your risk tolerance. [?]</p>

Sample Size per Variation

870,000

Want to maximize conversions with machine-learning? Learn more about [Multi-Armed Bandits](#).

Fig. 6. Calculation of the sample volume

As can be seen from Fig. 6, Optimizely claims that 870,000 users should fall into each group.

We translate the sample size into the approximate duration of the test:

Calculation No. 1. Sample size × number of groups in the experiment = total number of required users.

Calculation No. 2. The total number of required users ÷ the average number of users per day = approximately the number of days of the experiment.

If the first group needs 870 thousand users, then for the test of the two options, the total number of users will be 1,740,000. Taking into account the traffic of 1,000 players per day, the test should last 1,740 days. Such duration is not justified. At this stage, we usually review the hypothesis, the raw data, and the feasibility of the test.

Example 1 with Level 3 Improvement – Conversion represents the proportion of those who successfully completed Level 3. That is, the conversion rate is 85 %, we want to increase this figure by at least 11 %. At a confidence level of 95 %, we get 130 users per group (Fig. 7).

Baseline Conversion Rate

85%

Your control group's expected conversion rate. [?]

Minimum Detectable Effect

11%

The minimum relative change in conversion rate you would like to be able to detect. [?]

Statistical Significance

95%

95% is an accepted standard for statistical significance, although Optimizely allows you to set your own threshold for significance based on your risk tolerance. [?]

[EDIT](#)

Sample Size per Variation

130

Want to maximize conversions with machine-learning? Learn more about [Multi-Armed Bandits](#).

Fig. 7. Determination of the number of users

So, with the same amount of traffic of 1000 users, the test can be completed in less than one day. But this conclusion is incorrect, because it does not take into account weekly seasonality. User behavior differs on different days of the week, for example, it may change on holidays. Also, in some projects this influence is very strong, in others it is barely noticeable, therefore weekly seasonality in indicators is always observed and taken into account in the analysis. Therefore, the duration of the test must be rounded up to weeks to account for seasonality.

Most often, the testing cycle is one to two weeks, depending on the type of A/B test.

5. Conducting the experiment.

After running an A/B test, there is an immediate desire to look at the results, but this should not be done until the necessary sample is collected and a number of days have passed after the test has been run. The process should be set up in such a way that you can see up-to-date data on a daily basis to monitor the key performance indicators (KPI) of the projects. The main rule is not to draw premature conclusions. All conclusions are formulated in accordance with the established design of the A/B test and summarized

in a detailed report, and during the test, only the change in the indicator from the moment the A/B test is started is monitored.

For example, how the Completion Rate can change daily in an A/B test, Fig. 8.

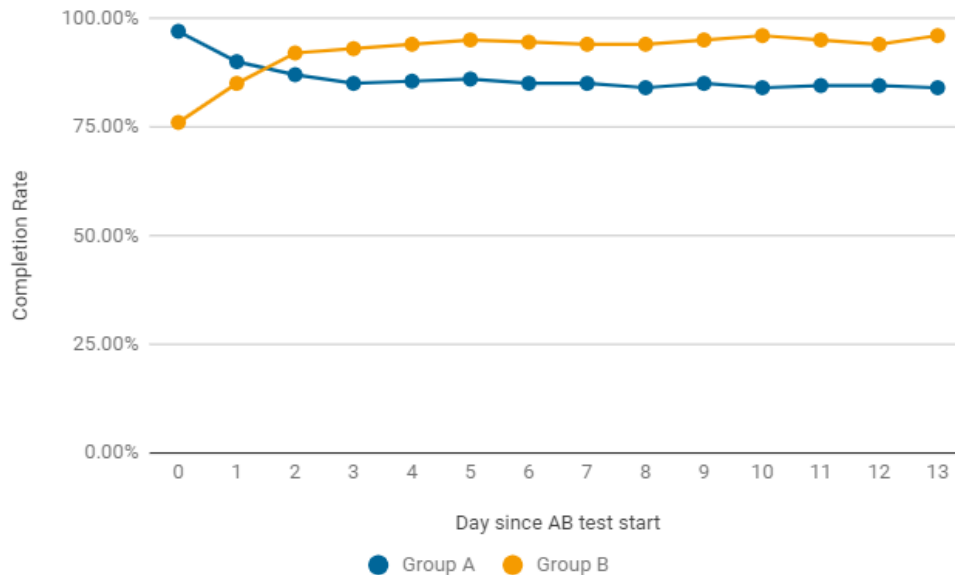


Fig. 8. Dynamics of the indicator changes during the A/B test

Yes, we can see that in the first two days after the start of the test, the version without changes (group A) won, but it turned out to be just a coincidence, since after the second day, the indicator in group B gets consistently better results. So, to complete the test, you need not just statistical significance, but also stability, so you need to wait for the end of the test and only then draw conclusions.

6. Analysis of the results.

Calculating key metrics is not particularly difficult, but evaluating the significance of the obtained results is.

Online calculators can be used to check the statistical significance of results when evaluating quality metrics such as Retention and Conversion.

Top 3 online calculators for such tasks:

1) Evan's Awesome A/B Tools [0] is one of the most popular online calculators that implements several methods for evaluating the significance of a test. But when using it, you need to clearly understand the essence of each entered parameter, independently interpret the results and formulate conclusions.

2) A/B Testguide [2] is an online calculator that will help you understand the essence of the significance assessment method. The advantage of this calculator is the graphical visualization of the results in the form of two distributions built on the basis of the initial data.

3) Neilpatel's A/B Testing Calculator [3] is an online calculator for quick evaluation of tests with two or more groups. Its advantage is ease of use and formulation of the conclusion based on the winning result.

Example 2. For the analysis of A/B tests, we have a dashboard that displays all the information necessary for drawing conclusions and automatically highlights the result with a significant change in the target indicator, Fig. 9.

Level	Group	levelID	UsersStart	UsersComplete	CompletionRate
3	A	3	3872	3252	83.99%
	B	1003	3968	3730	94.00%

Fig. 9. Information for the A/B test conclusion

Show how to construct conclusions from this A/B test using online calculators.

Output data: in group A, out of 3872 users who started Level 3, only 3252 users successfully completed it – that's 84 %.

In group B, out of 3968 users, 3730 successfully passed the level – that's 94 %.

Using the Evan's Awesome A/B Tools calculator, we will calculate a confidence interval for each option, taking into account the sample size and the selected significance level, Fig. 10.

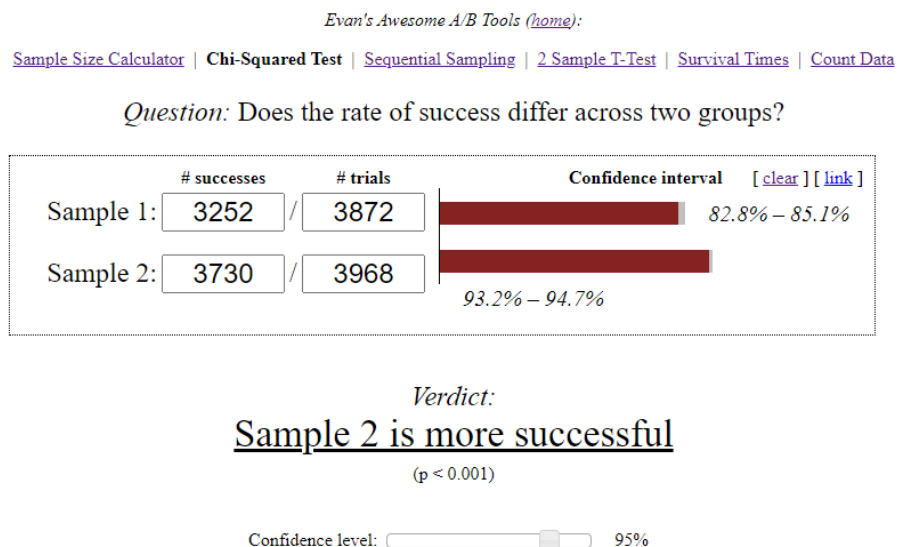


Fig. 10. The results of using Evan's Awesome A/B Tools calculator

Thus, the conversion rate of group A is 84.0 %, the confidence interval is 82.8 % – 85.1 %. The conversion rate of group B is 94.0 %, the confidence interval is 93.2 % – 94.7 %. The difference between them: $(94 \% - 84 \%) / 84 \% = 0.119 = > 12 \%$. Therefore, the conversion rate of group B is 12 % higher than the conversion rate of group A. This result is a consequence of the changes made, not a coincidence with a confidence level of 95 %.

Based on the results of the analysis, it is recommended to apply group B settings for all users.

Similar results will be obtained with the A/B Testguide calculator, Fig. 11.

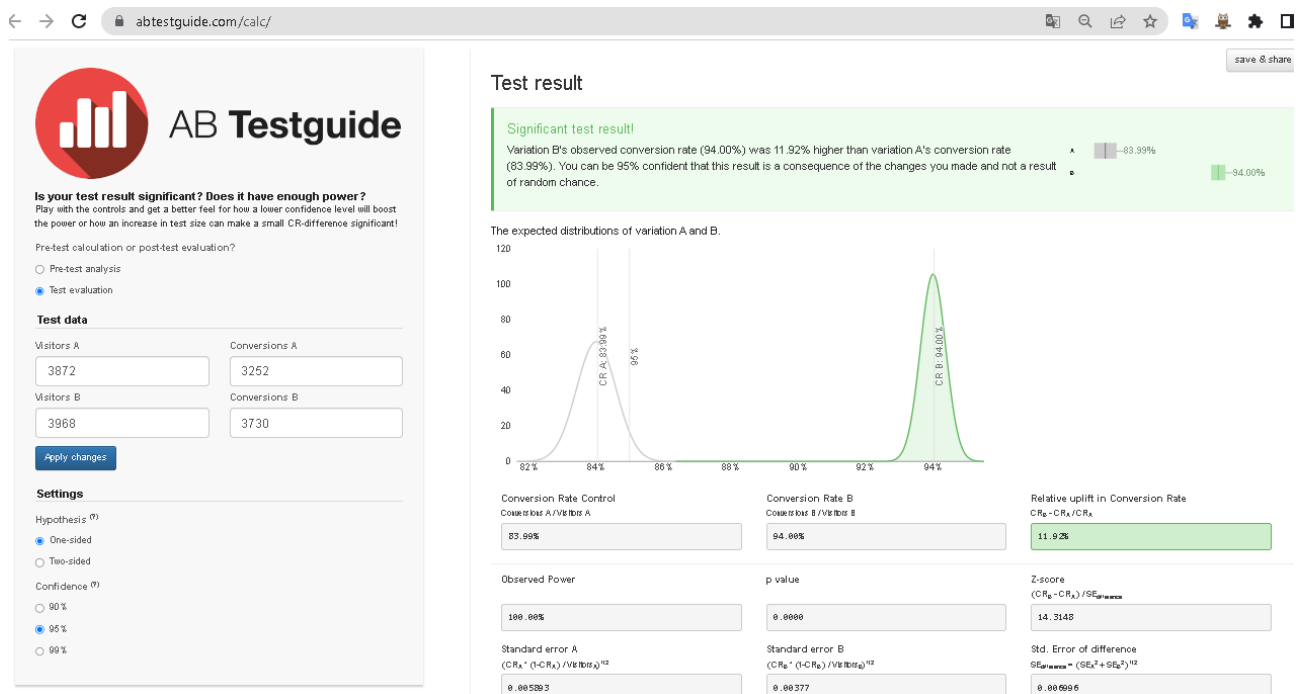


Fig. 11. The results of using the A/B Testguide calculator

As can be seen from Fig. 11, the A/B Testguide calculator also allows you to get a graphic result and a ready formulated conclusion.

Fig. 12 shows the results of using Neilpatel's online A/B Testing Calculator.

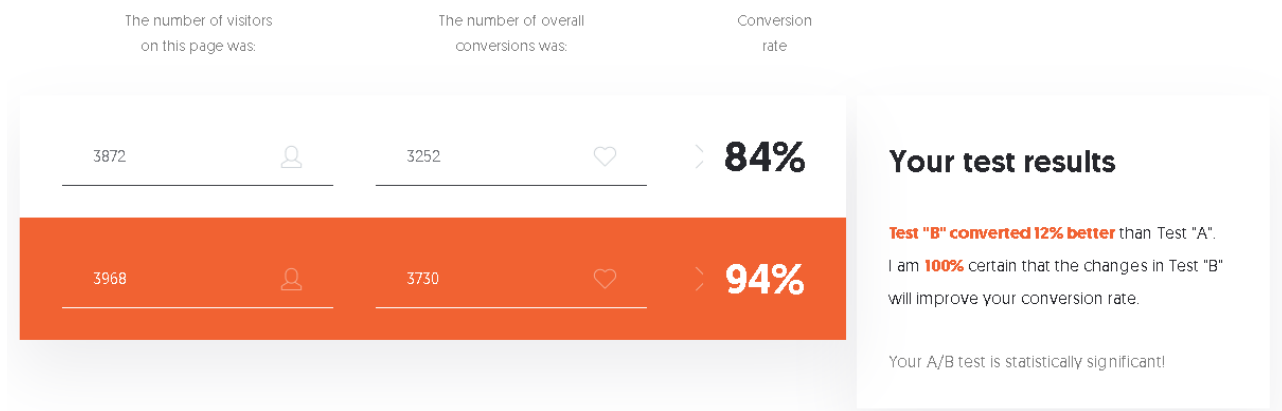


Fig. 12. The results of using Neilpatel's A/B Testing Calculator

Based on Fig. 12, we have that the conversion of group B is 12 % better than that of group A, that is, changes in group B will improve the conversion rate.

It should be remembered that if the target metric is quantitative – the average check or the average length of the first session, then the considered online calculators are not applicable and more advanced evaluation methods are required.

Draw up a report on laboratory work as follows: the title page, the analysis results with conclusions and explanations, general conclusion, a list of references (if necessary). Type the text of the report in the Arial format, font 14, line spacing 1.2. Sheet margins: 2 mm on each side.

Laboratory work 2. Opportunities for business in the age of the Internet

The goal is to master the basic concepts of web analytics, to deepen knowledge about the latest information technologies in web analytics.

Tasks

1. Write an essay on one of the following questions:
 - a) modern trends in digital business and web analytics: relationship and interaction;
 - b) levels of application of web analytics – who uses it, how and where?

c) basic principles of business operation on the Internet and directions of promotion of web resources;

d) description of the stages of the evolution of web analytics and modern approaches in the methodology of web analysis;

e) hard and softskills of web analytics.

2. Make a report on the laboratory work in the form of a presentation based on the results of the essay and prepare a report for 5 – 7 minutes.

Guidelines

To complete the task, students need to divide into several groups of 2 – 3 people.

When writing an essay, it is necessary to clarify the problems of the chosen issue, the state of its development in modern conditions, indicate the positive and negative aspects of solving the issue, and cite foreign experience. At the end of the essay, it is necessary to indicate the competences acquired by the student during his writing the essay and study of the chosen issue.

So, for example, the problem "Web analytics can become statistics, but statistics cannot always be web analytics" can be solved by considering the main tasks of statistics and web analytics, comparing them and giving specific examples that prove or disprove statements about similarities or differences of web analytics and statistics and their interaction.

Make a report on the laboratory work in the form of a presentation on 15 – 20 slides as follows: indicate the name of the question and the performers, concisely explain the main points of the question under consideration, provide illustrative material in the form of diagrams, tables, graphs, draw conclusions based on the results of the task, indicate the competences that were acquired during the performance of the task.

Laboratory work 3. Characteristics of web analytics tools

The goal is to consolidate theoretical skills regarding web analytics tools and the principles of search engine operation.

Tasks

1. Write an essay on one of the following questions:

a) basic capabilities and types of web analytics;

b) features of the best basic site analytics systems;

- c) description of additional services and web analytics tools;
- d) use of web analytics in public organizations;
- e) use of web analytics in Internet marketing.

2. Form a report on the laboratory work in the form of a presentation based on the results of the essay and prepare a report for 5 – 7 minutes.

Guidelines

To complete the task, students need to divide into several groups of 2 – 3 people.

When writing an essay, it is necessary to clarify the issues of the chosen issue, show positive and negative features, characterize development trends, conduct a comparative analysis with foreign experience. At the end of the essay, it is necessary to indicate the competences acquired by the student during his writing the essay and study of the chosen issue.

So, for example, the question "Google Analytics as a site analysis system" can be revealed by considering the main functions of Google Analytics and the tasks that are solved with its help, giving specific examples that show how, using Google Analytics, a business can improve the efficiency of the site and increase your profits.

Make a report on the laboratory work in the form of a presentation on 15 – 20 slides as follows: indicate the name of the question and the performers, concisely explain the main points of the question under consideration, provide illustrative material in the form of diagrams, tables, graphs, draw conclusions based on the results of the task, indicate the competences that were acquired during the performance of the task.

Topic 2. Google Analytics – a digital search tool

Laboratory work 4. Using Google Analytics to analyze the sites of business structures

The goal is to gain theoretical and practical knowledge about the possibilities of using Google Analytics to collect data on the websites of business structures, generate reports and analyze them.

Tasks

1. Conduct analysis of the website of the company (organization) chosen to perform laboratory work 1 or the test site. Conduct the analysis using the metrics and KPI system of Google Analytics and various analytical methods.
2. Make a report on laboratory work in the form of an analytical reference.

Guidelines

In the analytical reference (approximately 5 – 6 pages), show the results of the analysis in the form of tables and graphs. Give conclusions based on each of the performed calculations. Provide a general conclusion on 1 page regarding the effectiveness of the website of companies (organizations) related to the selected type of business or test site.

Google Analytics is a free analytics tool that provides detailed web traffic statistics.

To get started with Google Analytics, you need a Google Account. Then go to the address [4] and log in under the required account (under the login and password from gmail). In the "Administrator" tab (the gear in the lower left corner), click on the "Create an account" button.

Usually, the tracking code obtained when setting up Google Analytics is installed on the site by the site administrator.

When performing laboratory work, a test account will be used, which can be downloaded from the link [5].

The main page of Google Analytics 4 presents useful information that is selected taking into account actions in Analytics. Here you can monitor traffic, go to different sections of the service and get data about sites and mobile applications. Personalization of the content on the main page depends on how often Analytics is used.

For example, if you regularly view the "Total income" indicator, the Home tab will show information about the change in income for the last seven days. If you click on the tab, you will see a solid line (trend) for the last seven days, which can be compared to the data for the week before that period (the dashed line). Both graphs are divided into parts, each of which is a separate day, Fig. 13.

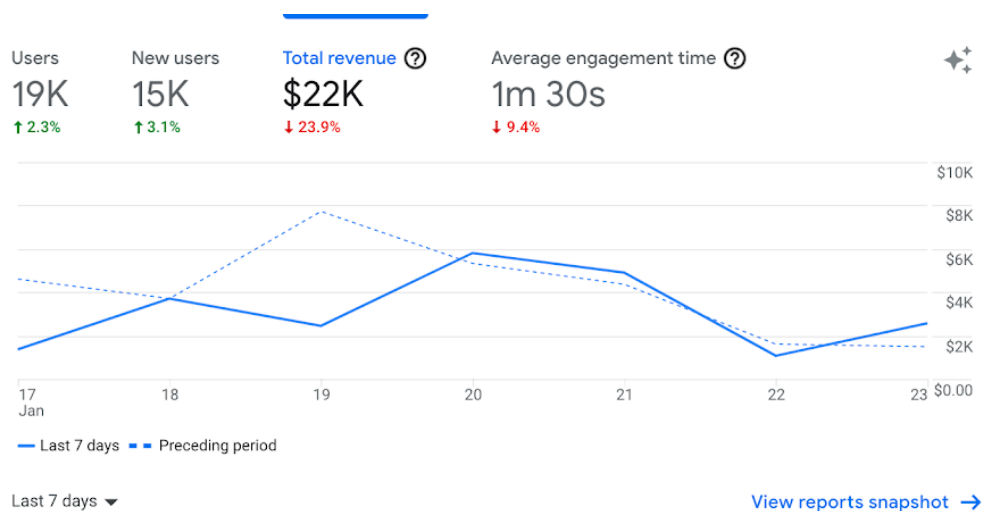


Fig. 13. A view of the Home tab and trends for the Total Revenue indicator

On the Home tab, in the "Recently accessed" section, there is a link to the various sections of the Analytics account that have been visited recently. For example, if the "Overview" page was visited, a link to it will appear on the main page along with links to other sections that were recently opened.

By going to the report from the "Recently accessed" section, you can see the changes made to this report. Thanks to this, you can quickly return to the previous analysis. For example, if you changed the main option, when you open the report from the "Recently accessed" section, you will see that the new option has been applied. Let's say you were working with the "Traffic Acquisition" report and changed the main parameter in it – instead of the "Default channel group associated with the session" option, you selected "Session channel". Also, you have not sorted the report by decreasing the number of users, but by decreasing the number of interactive sessions. If you go to the "Traffic Attribution" report from the "Recently accessed" section the next day, you will see that all the new settings have been applied.

If you're new to Analytics and running low on cards, check out the "Offers for You", "Statistics & Tips" sections for popular Google Analytics 4 cards to help you find useful information.

Google Analytics 4 offers standard reports, which are formed according to the following segments, each of which has its own extended list of standardized tables and graphs, according to which the analysis is carried out:

a brief overview of the reports. This segment presents the main most used indicators and their corresponding trends;

real-time reports. This segment provides information about users who visited the site in the last 30 minutes: the number of users, the pages they view, which countries are the sources of user actions, traffic sources, real-time conversions, etc. A real-time report provides information on user-level parameters and metrics and lets you understand how you engaged users;

users (audience), which includes indicators and metrics about visitors to your site and users of the application, including their demographics and information about what technologies they use (for example, browser and application versions). Demographic data helps determine who is visiting your site. The report will allow you to form a portrait of the purchase, create target audience groups and use this information for segmentation. As a result, you can make advertising more personalized and increase its effectiveness.

Here it is advisable to trace and analyze:

age and gender of your demographic audience;

achieving affinity and market segmentation according to interests;

language and location of users;

new and returning visitors, their frequency and behavioral participation;

your audience's technology browsers, operating systems, and networks;

information about the mobile device under Mobile;

overview of custom variables in real time;

benchmarking channels, locations and benchmarked devices. Benchmarking allows you to compare indicators with other related industries. That way, you can chart what you need to beat the market;

sources of traffic (acquisition), which includes indicators and metrics of conversion, traffic attraction. This segment provides information on the breakdown of traffic into organic, social networks, paid advertising, etc. Acquisition analysis is done to find out the sources of your web traffic. Using acquisition analysis, it is advisable to track and analyze:

traffic from all channels, a specific source/medium and from referrals;

traffic in AdWords (paid search);

traffic from search engines, where you can see the queries that worked, landing pages and geographic breakdown;

social media traffic that helps identify networks in which users participate; see referrals where your traffic comes from; view your activity in the hub; track site bookmarks, etc. All this helps to measure the influence of social networks on your site;

interaction (behavior), which includes indicators and metrics of events, conversions, pages and screens, landing pages. Behavioral analysis monitors user activity on the website. Behavioral data should be tracked in segments:

site content, which shows how many pages have been viewed, provides information on detailing the content, on the dynamics of the "Sessions" indicator according to the "Landing page" parameter, on the interaction of data on the deployment of content and the exit page. Content deployment is the division of data into folders. The landing page is the page where the user lands, and the exit page is the page where the user leaves the site;

events, which shows the actions of visitors with the content, provides the dynamics of the "Number of events" indicator according to the "Event name" parameter, etc.;

monetization, retention (conversion), which includes indicators and metrics of purchases, advertising, retention of users, divided by various characteristics. Conversion analysis provides information about the achievement of a user's goal or transaction on the site. For example, download, place an order, buy, etc. To track conversions in analytics, you need to define a goal and specify a tracked URL. Here it is advisable to analyze: the total number of buyers and income from purchases, the dynamics of the "Purchased goods" indicator by the "Product name" parameter, monitor user retention and conduct their cohort analysis.

Cohort analysis is a research method where users are divided into groups (cohorts) based on certain characteristics and their behavior is monitored over a period of time. This method allows you to look at user actions in dynamics.

The cohort method takes into account the following characteristics for analysis:

an action that unites users into a cohort: subscription, registration, purchase, and others;

the time during which the action took place: a day, a week or a month, longer periods are also possible;

the study interval during which the cohort is monitored;

indicator that affects the business: ROI, customer retention, conversion, LTV and others.

Cohort studies help to understand how key metrics differ for different segments and to see a more detailed picture regarding an advertising campaign or other marketing actions, for example, rebranding, testing a new site, etc.

Types of data found in web analytics tools:

the first describes the characteristics of users, their sessions and actions.

In Google Analytics, they are called parameters;

the second is metrics. These are common measurements of users, sessions, and actions. Metrics are multiple data. Metrics help to understand user behavior.

A KPI is a key performance indicator that is usually measured in percentages and has a certain norm. For example, by comparing your actual KPI with the market average, you can draw a conclusion about business performance. KPIs help identify the main areas of growth and areas of risk, so promotion goals should be as specific and measurable as possible.

During the task, the student needs to analyze each of the segments of Google Analytics 4 reports and draw conclusions about the performance of the analyzed site. At the same time, it is advisable to track the indicators for each of the above segments and provide a description of the site's performance based on the analysis of the characteristics of visitors according to various characteristics, their activity, conversion, traffic sources, etc.

Prepare a report on laboratory work as follows: the title page, the results of the analysis of the information material with conclusions and explanations, a general conclusion, a list of references (if necessary). Type the text of the report in the Arial format, font 14, line spacing 1.2. Sheet margins: 2 mm on each side.

Topic 3. Google Sites as an integrator of digital resources

Laboratory work 5. Creation and presentation of a Google Site

The goal is to acquire practical skills in creating a Google Site, filling it with content and presenting it to users.

Tasks

1. Create a Google Site for a company in the field of business that was chosen to perform laboratory work 1.

In accordance with the types of sites, choose the one that will meet the goals of the company and, using the Google Site designer, fill the site with content in such a way that the content of the site corresponds to the purpose of its activity. At the same time, the site should be creatively designed and have reasonable content. The number of website pages should be 4–5;

pages should have subpages (2–3); add various objects to pages/subpages (text, image, link, video, etc. or any desired file from Google Drive).

Link the created site with a Google Analytics account to receive statistics and indicators of the site usage.

Access to the created site must be specified in the laboratory report.

2. Create a report on laboratory work in the form of an analytical reference.

Guidelines

In the analytical reference (approximately 5–6 pages), show the results of the analysis in the form of screenshots from the pages of the created site. Provide recommendations on promoting the websites of companies of the chosen type of business and improving their work efficiency.

Consider the stages of creating a Google Site:

1. Create or have a Google account, that is, an account at gmail.com.

2. Go to your own Google Drive.

3. Select the template under the inscription "Create a site". To do this, follow the sequence of commands: "+ Create", "More", "Google Sites" at the top left.

4. Create your own site design or use the suggested templates at sites.google.com.

5. In the Designer window of the future site, enter the name of the site in the upper left corner of the screen and press the Enter key. Change the title of the site's main page in the "Page Title" field. Here it is also possible to edit the text: change the font, size and color, add links, etc. If desired, you can add a site logo.

We will get the following view, Fig. 14.

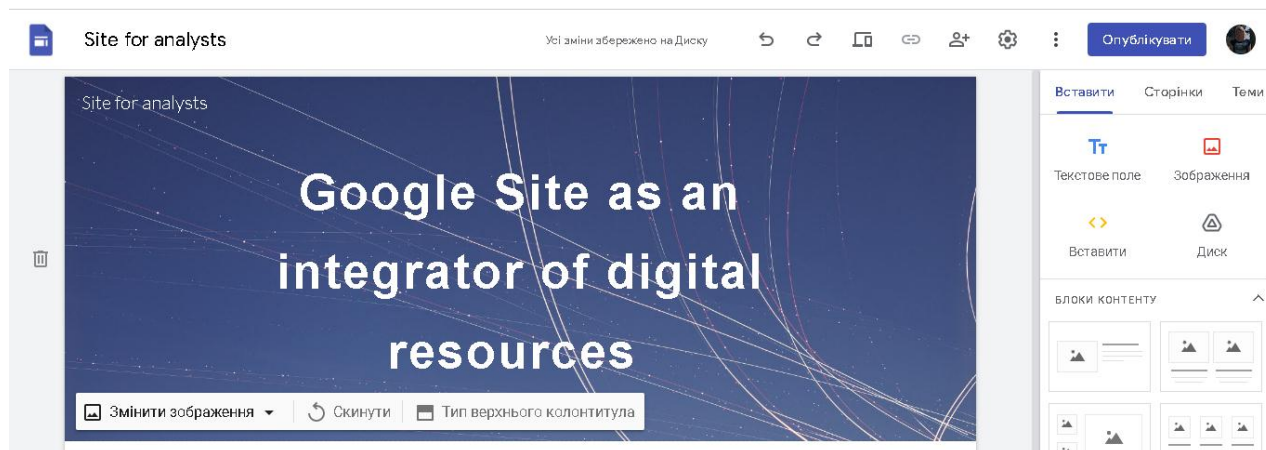


Fig. 14. Creating a Google Site

6. Go to the site settings panel located to the right of the Site Designer. Go to the Themes tab and choose a theme for the entire site. By clicking on each proposed topic, we automatically see the change in the design of the site and choose the one we need (Fig. 15).

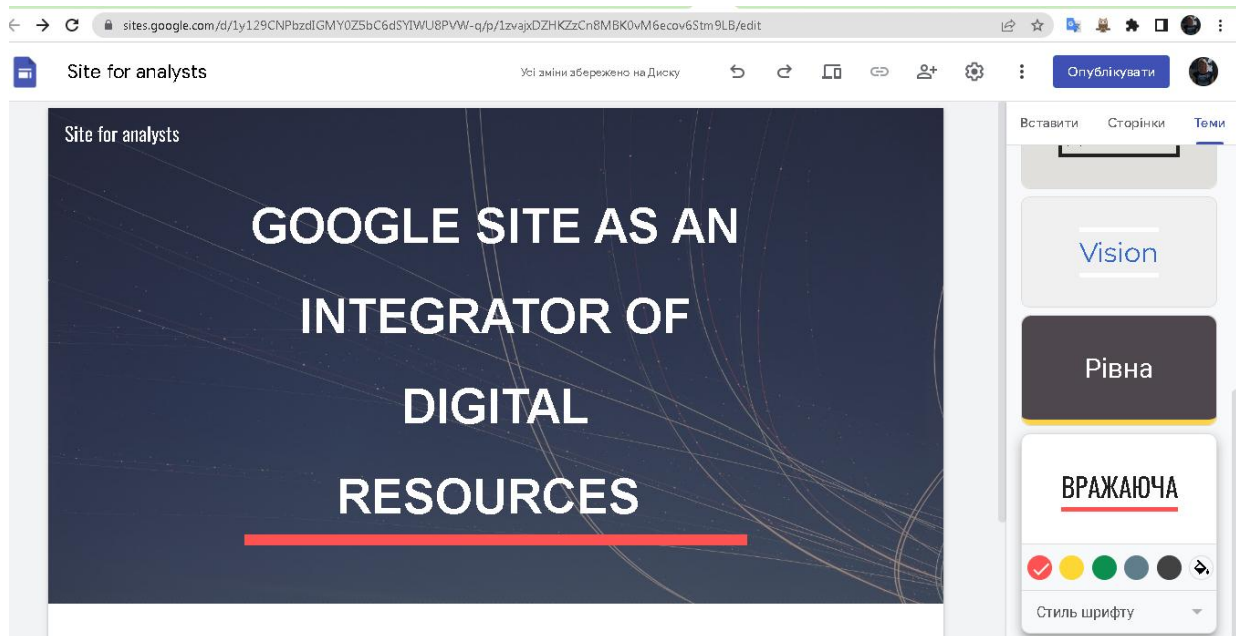


Fig. 15. Website theme design

7. Go to the Pages tab and add the required number of pages using the + button. The list already contains the main page – the title page of the created site. Name the new page and click "Done".

You can add subpages. To do this, select the context menu of the created page (click on the ⋮ button and select the "Add subpage" command). The site developer can add the desired number of pages, change their placement, create a copy of existing pages and delete redundant ones.

8. Go to the content of the site. To do this, select the Insert tab and choose what exactly needs to be added to the site page: text field, image, link and video, file from Google Drive, layouts.

To save the changes made, it is necessary to publish them.

9. After the desired object has been added to the site page, it can be edited using additional panels that appear parallel to the object itself:



this panel allows you to change the color of the text, duplicate the text or delete it;



this panel allows you to resize the image (crop it), undo cropping, add a link, or delete the image. You can also add text or a caption to the image using the context menu;



this panel allows you to open a link in a new tab or delete it.

10. To view the created Google Site, use the Preview button, Fig. 16.

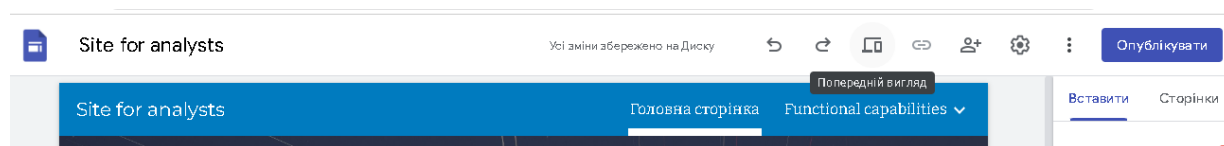


Fig. 16. Preview of the created site

You can choose the viewing format: phone, tablet or computer.

11. To be able to view the site by other users, make a publication in the online space through the appropriate button at the top right: Publish.

In the window that appears, come up with and enter the characters of the future address (more than 3, using only lowercase English letters, numbers and dashes; no spaces).

Confirm the publication via the appropriate button at the bottom right of the window – "Publish".

As a result, the site is published, that is, it is placed on the Internet with the appropriate link.

Draw up a laboratory report as follows: the title page, the site development results with explanations of the content, a general conclusion in the form of recommendations for improving the site and measures to promote it, a list of references (if necessary). Type the text of the report in the Arial format, font 14, line spacing 1.2. Sheet margins: 2 mm on each side.

Content module 2. Practice of using web analytics

Topic 4. Google data analysis and visualization tools

Laboratory work 6. Using Google Forms to organize online surveys and provide effective feedback

The goal is to acquire practical skills in creating a Google Form in accordance with the purpose of collecting information, conducting a survey based on the form and analyzing the responses of respondents.

Tasks

1. Develop a Google Form in accordance with the object of research (the chosen type of business). Specify the purpose of the survey in accordance with the purpose of gathering information about the activities of a certain type of business, fill out the Google Form with the necessary questions of various types, using the form designer and demonstrating skills in editing and configuring the Google Form interface.

Send the finished form to the respondents (you can do it to the group mates), collect the data and process it. In the report, provide an analysis of the obtained results.

2. Create a report on laboratory work in the form of an analytical reference.

Guidelines

In the analytical reference (approximately 5–6 pages), show the results of the analysis in the form of screenshots from the pages of the created Google Form. Create a report based on the data received from Google Forms and analyze them.

Consider the stages of creating a Google Form:

1. Log in to your Google account or access the creation of Google Forms via the link [6] and, by clicking on the block "+Create a form", proceed to edit the parameters of the future form.

2. When creating a Google Form through your own account, you must log in to Google Drive and select the appropriate command – "+Create Google Forms".

3. Change the name of the form from "New form" or "Form without a name" to the one you need, for example, "Discipline Satisfaction Questionnaire". The new form name will make it easy to find the created form on your disk. Below, in the line "Description of the form", you can, if you wish, provide a detailed explanation about the purpose of using your form (for example, to describe the test or ask you to fill out a questionnaire or explain why you need it).

4. Configure the Google Form. To do this, use the toolbar located above the form (Fig. 17).

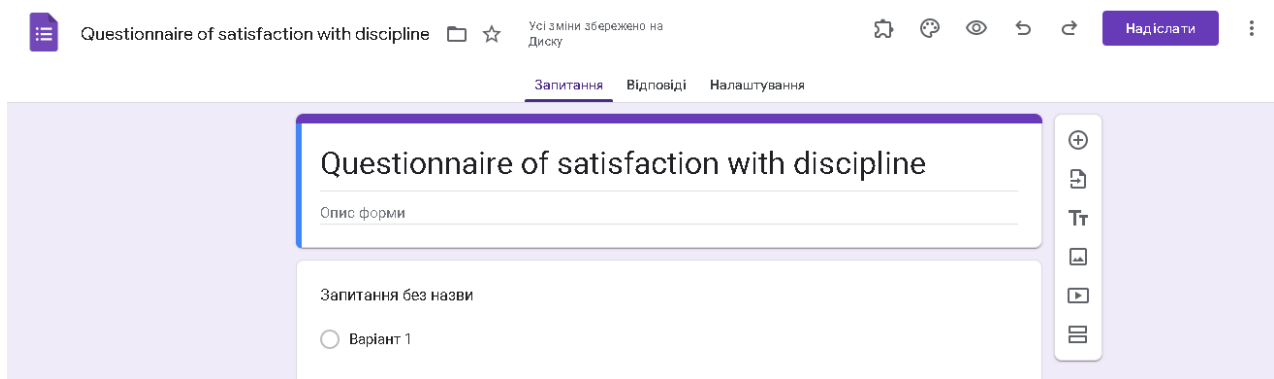


Fig. 17. **View of the toolbar for the form**

Google Forms customization tools allow you to:

choose the required fillings or use ready-made examples of Google Form themes;

preview the Google Form to see how the Google Form will appear to respondents;

make additions, copy, print Google Form and other settings.

5. Enter the questions of the form by clicking the "+add question" button. If the question is mandatory, then at the bottom to the right of the question, turn on "Required". In the viewing mode, we see Fig. 18.

6. Send the created Google Form to interested respondents. For this, click on the Send button, which is located at the top right of the form, Fig. 19.

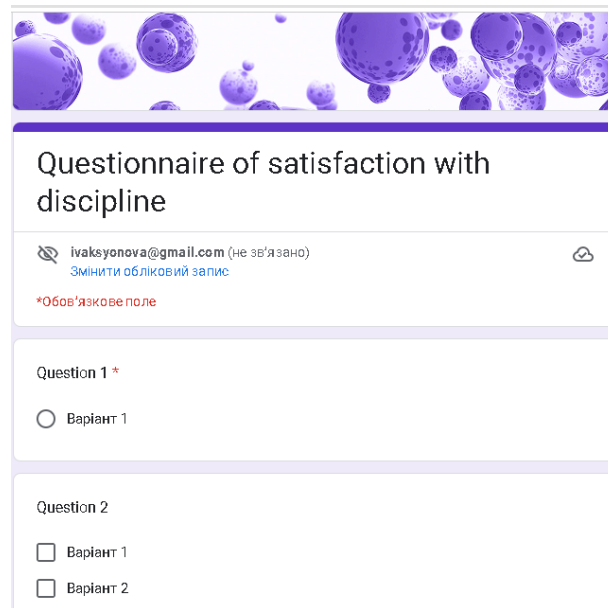


Fig. 18. The **Google Form** in the preview mode

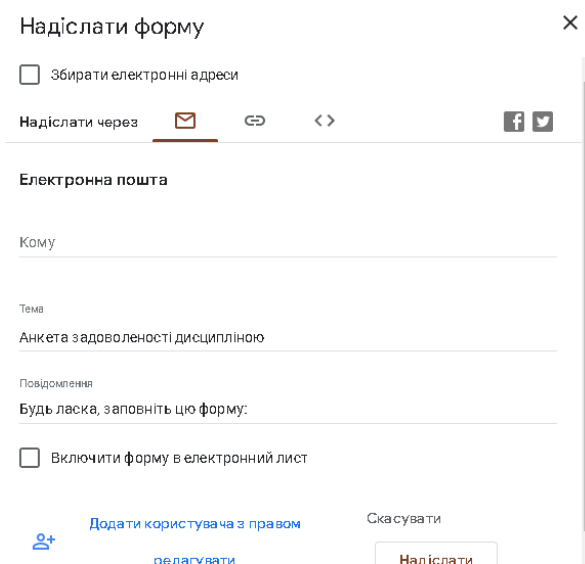


Fig. 19. The **"Send" button menu**

In Fig. 19, the following methods of sending Google Forms are presented:
 via e-mail – the recipient can immediately fill out the survey in the e-mail, he does not need to go anywhere, because the form is embedded in the body of the message;

through a link – a link is available in this tab, which can be copied and sent to respondents. For convenience and correct display of the link, you can create a short URL;

via HTML code – it is possible to copy for further placement on the site;

via social networks – Google Forms can be sent to social networks using the appropriate buttons.

It is absolutely necessary to test the created Google form yourself before sending it to respondents.

7. Find out the answers to the Google Form and analyze the results. To do this, go to the "Answers" tab to work with the results. This section will display all the necessary information after the answers – from the general summary, statistics on individual questions of different users to the answers of a specific respondent. All answers are collected in the table automatically. To import them, click on the Google Sheets icon. To deactivate the function, move the "Accept answers" slider if the required amount of information is received.

8. Save the Google Form. To do this, use the downloadable csv format.

9. Close the Google Form. To do this, you need to close the tab in the browser, and the created Google Form will be automatically saved on the Google Drive.

Draw up a report on the laboratory work as follows: the title page, the results of form development with explanations for creation of the form, a general conclusion in the form of the results of the analysis of respondents' answers, a list of references (if necessary). Type the text of the report in the Arial format, font 14, line spacing 1.2. Sheet margins: 2 mm on each side.

Laboratory work 7. Working with Google Public Data Explorer

The goal is to gain practical skills in using Google Public Data Explorer to obtain analytical data from global research resources.

Tasks

1. With the help of the Google Public Data Explorer, create interactive visualizations according to the description of the activity of a certain type of business, selecting the appropriate indicators from the Public Data data library.

Demonstrate skills in editing and customizing the appearance of a visualization.

2. Create a report on laboratory work in the form of an analytical reference.

Guidelines

In the analytical reference (approximately 5–6 pages), show the results of the analysis and provide screenshots from Google Public Data Explorer pages of the obtained results and a link to the created interactive visualization.

There should be at least five indicators that will be visualized, after each figure, provide an analysis of the data based on the indicators shown in the figure.

Consider the interface and practical application of the Google Public Data Explorer, which is used to create high-quality visual images. The Google Public Data Explorer provides publicly available data and forecasts from various international organizations and scientific institutions.

To start working with the Google Public Data Explorer, you need to go to the link [7].

The Google Public Data Explorer workspace is divided into two parts:

on the left, there are data sets, indicators and their providers;

on the right, there are the found results or interactive charts that reflect the results of the search for indicators for different time periods and for different objects (countries) of the study.

Statistical information is displayed in the form of line graphs, histograms, line charts, cartograms, etc. If necessary, the user can add his own indicators for search and visual display. To do this, it is necessary to select an indicator in the left part of the Google Public Data Explorer workspace, the time period of the study, objects of comparison, demographic characteristics, etc.

For example, consider the unemployment rate across the countries of the European Union (Fig. 20).



Fig. 20. The dynamics of unemployment

If necessary, you can change the appearance of data visualization in relation to the selected indicator, change the scale on the y-axis, etc. (Fig. 21).

To do this, use the toolbar, which is located on the upper left above the diagram.

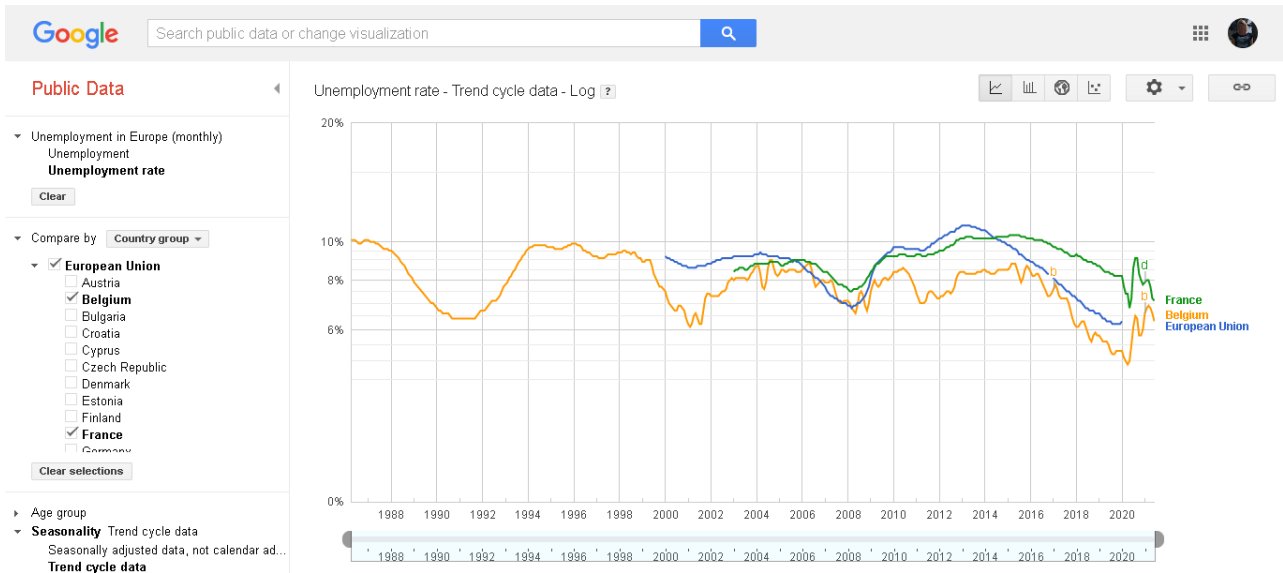


Fig. 21. The dynamics of unemployment in the EU, France and Belgium

After creating an infographic, you need to get a link to it for distribution.

To receive a link, click on the button with a horizontal eight "Link" in the upper right corner of the page.

If necessary, you can embed the created visualization on a Google site, for which you need to copy the link from the second line "Insert HTML to place on a web page" (the link must start with <iframe...>), Fig. 22.

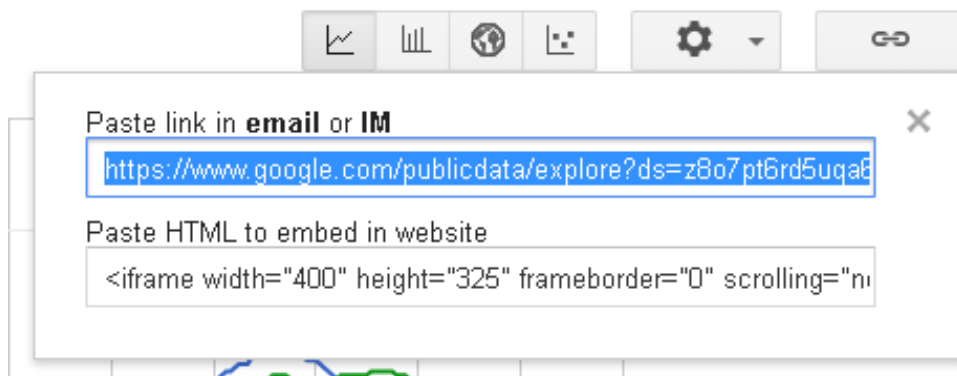


Fig. 22. A reference to the created visualization

Prepare a laboratory report as follows: the title page, the results of creating an infographic based on various indicators that characterize the chosen type of business, a list of references (if necessary). Type the text of the report in the Arial format, font 14, line spacing 1.2. Sheet margins: 2 mm on each side.

Topic 5. Areas of use of web analytics

Laboratory work 8. Visualization and interactive business research using Google Trends

The goal is to gain practical skills in using the Google Trends analytical tool to track the popularity of search queries on the Internet.

Tasks

1. With the help of Google Trends, create several queries according to the research of a certain type of business, make their comparative analysis using the Google Trends toolbar.

Demonstrate skills in setting up query analysis by various objects, time period, categories, search type.

2. Create a report on laboratory work in the form of an analytical reference.

Guidelines

In the analytical reference (approximately 5–6 pages), show the results of the analysis in the form of screenshots from Google Trends pages. Provide conclusions based on the results of the analysis and answer the question: What makes Google Trends so useful for your business?

Let's consider the essence of using Google Trends.

Google Trends is an online analytical tool from Google that tracks the popularity of search queries anywhere in the world. Google Trends is suitable for any business to analyze trends, compare the relevance of goods/services in different locations and time periods, determine the time when your services are most relevant. So, this tool gives a general understanding of the popularity of a certain topic, it is used when working with seasonality, to find fresh trends or compare the relevance of requests in different regions.

All results for Google Trends queries are shown in the form of graphs. The horizontal axis of the main graph shows time (since 2004), and the vertical

axis shows how often the query occurred in relation to the total number of searches worldwide. Below the main graph, the distribution of popularity across regions, cities and languages is displayed.

To start working with Google Trends, you need to go to the link [8].

Google Trends allows you to:

1) *enter and analyze requests*. There are general and specific requests. For example, you plan to open your own bakery. Go to Google Trends, type "bakery" and see statistics on demand. This is a generic query that won't help you. It is necessary to think like a user: a person does not need a bakery and information on how much time is spent on baking products. The user needs finished products in the form of fresh bread and buns. These are specific requests that need to be monitored (Fig. 23).

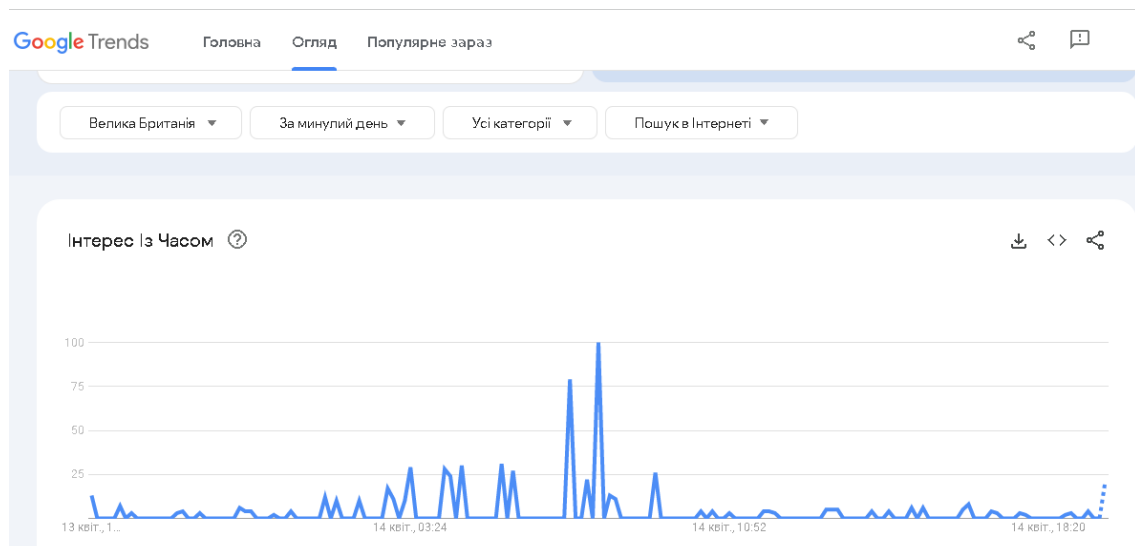


Fig. 23. The dynamics of the popularity of the request "fresh bread"

Google Trends algorithms select a period from the TOP queries and assign it a factor of 100. Scores for other periods are calculated relative to this maximum indicator. Based on Google Trends, the exact number of requests is not obtained, but it is possible to track the increase and decrease of the popularity of the request thanks to the coefficient.

Google Trends has filters that are located above the query dynamics and make it possible:

to see the dynamics of the request around the world, country or city;

to specify a time frame for the analysis so that unnecessary information does not distract attention;

to choose a category if the phrase is ambiguous. For example, the word "communication" can refer to both engineering networks and Internet marketing; to select the type of search. For example, search for pictures or videos on You Tube;

2) *use the control panel*, which is located in the upper left corner of the Google Trends page. With the help of this panel, you can go to the analysis and overview of the most popular requests now and over the years;

3) *use search operators* for efficient work. Operators are special characters and words that exclude similar queries in search results. For example, "bakery", "fresh pastries", "fresh croissants". If you enter the query "bakery" in English double quotes (" "), there will be no similar queries in the search output, but there will be queries with an additional word. For example, a family "bakery" or a French "bakery".

You must use quotation marks of the type " " to remove similar searches. The operator does not work with French quotes « ».

You can also use the «-» sign so that the query output does not contain the words you want to filter. For example, a query for «bakery – sold» will return "french bakery" but not "bakery for sale". If you use the «+» sign, it can be perceived as an "or" and then you can reach a larger audience. For example, «bakery + confectionery», such a query can look like this: "French bakery", "city confectionery", etc. Also, this operator is used to combine all possible options for writing a query with errors. Thus, for the query «ksyomi + syomi + xiaomi» you will see statistics for all spelling options;

4) *choose a category*. This is necessary in cases where a word or phrase in a search request has two different meanings. To do this, it is necessary to clarify to which topic the request belongs. For example, the word "transfer" is used in both transport and finance. Selecting a category allows you to get relevant statistics;

5) *compare the dynamics of several requests*. Google Trends allows you to compare the dynamics of 5 queries at the same time. The results are easy to evaluate by graphs. For example, to the request "fresh bread" we will add the request "bun" (Fig. 24).

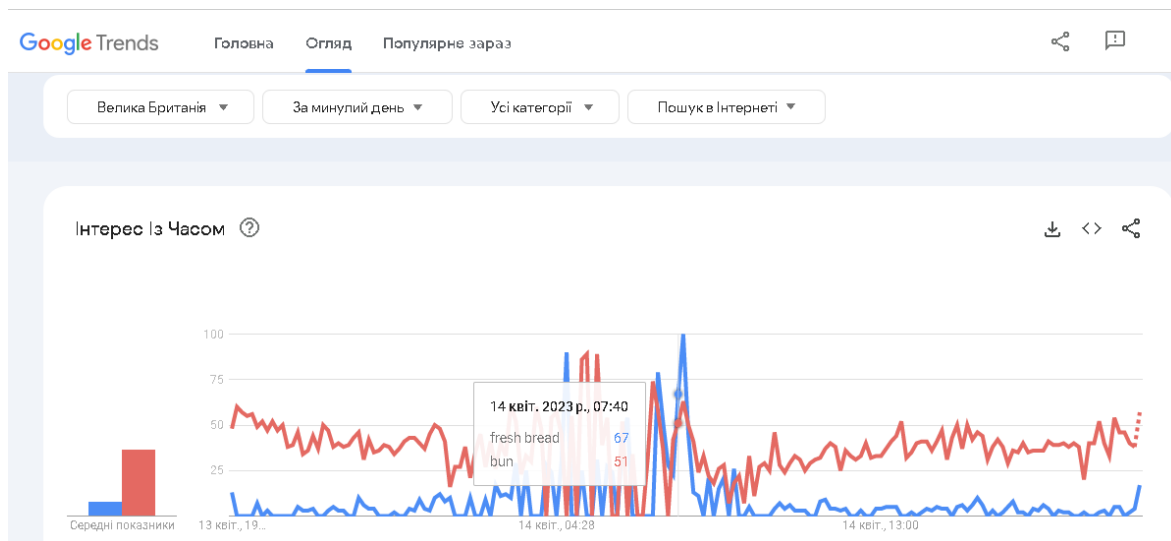


Fig. 24. Comparison of two requests

The red line represents the dynamics of requests for the word "bun", and the blue line – for "fresh bread". So, we can see that the demand for a bun is higher than for bread.

You can also see locally, in which regions which requests are more popular, which will allow you to optimally allocate resources for an advertising campaign between regions of the country. But it should be taken into account that Google Trends first shows the popularity of a specific query relative to others in specific regions, and then ranks them in descending order (Fig. 25).

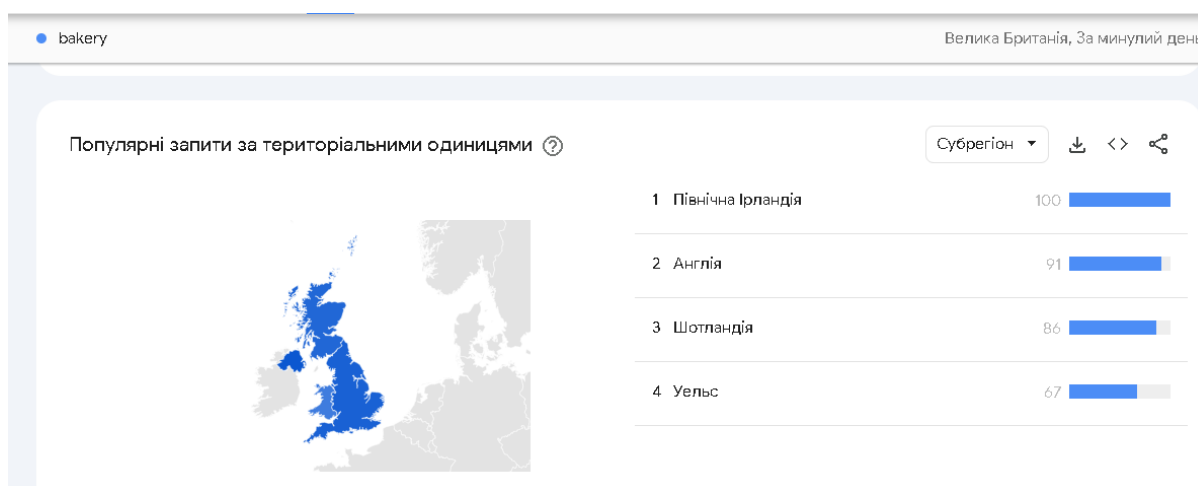


Fig. 25. The request "Bakery" in the territorial section of Great Britain

For example, if the query "Bakery" is more popular in England than in Scotland, this does not mean that there are fewer bakeries in Scotland.

This means that in Scotland the query "Bakery" has a lower frequency, they are searched for less than in England.

For a more detailed view of the results of the comparison in interactive mode, you need to point to the region you are interested in on the map;

6) *study current trends, find competitors and determine seasonality.* At the bottom of the page, Google Trends shows the queries "Related topics", i.e. those that are trending, topics for which queries have increased, and "Similar queries", i.e. those topics for which queries become leaders. For example, for the request "Bakery" we have the following information, Fig. 26, Fig. 27.

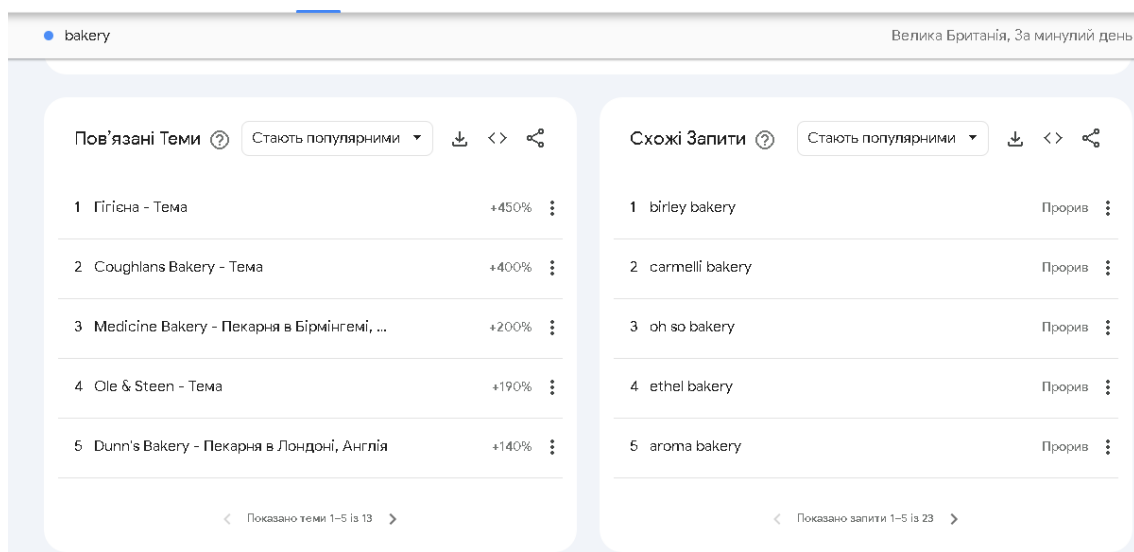


Fig. 26. Current trends for request "Bakery"

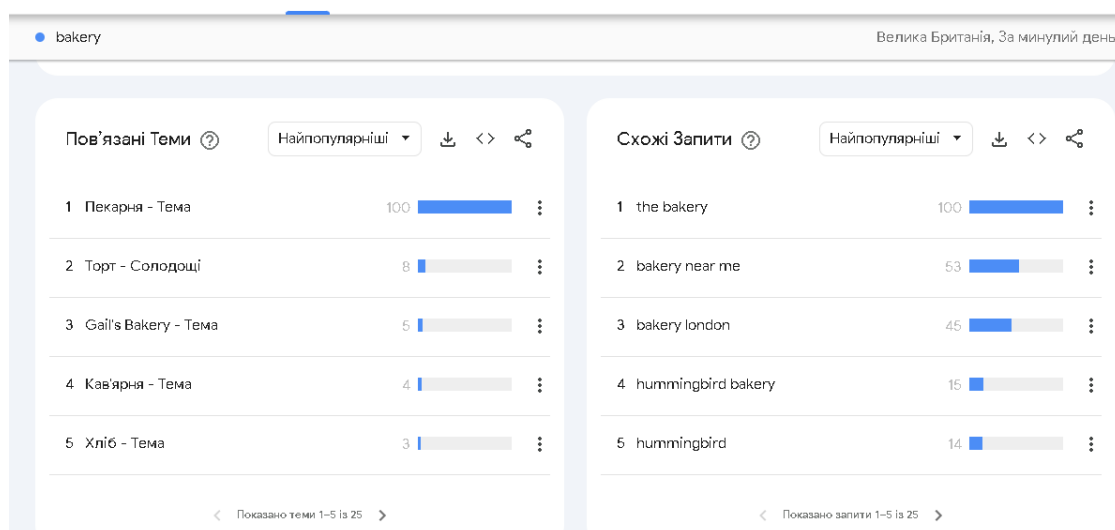


Fig. 27. Ranking of the most popular requests for bakeries


From Fig. 26, it can be seen that the most popular queries during the analyzed time period are queries related to the topic of bakeries, hygiene, Coughlans bakery, bakery in Birmingham.

The requests that have become very popular and are trending are for Burley's Bakery, Carmelli's Bakery and others. For them, we are witnessing such a phenomenon as a breakthrough, i.e. super-popularity. Such a phenomenon is characteristic of those requests, the popularity of which has increased very rapidly.

As can be seen from Fig. 27, bakeries remain the most popular requests (request rate for them is 100). They are the leaders, but "bakery near me" requests are gaining popularity, that is, you need to pay attention to the location of the bakeries.

Using information about the most popular trends, you can conduct an effective advertising campaign in a timely manner and be one step ahead of your competitors.

Google Trends allows you to analyze seasonality if you search for products that have it. The peaks on the graph, which can be used to determine the calendar time when this happens, will tell about seasonality.

To distribute the received search results in Google Trends, you can download the desired element or copy the link to it and embed it on Google. To do this, use the corresponding buttons located at the top right of each interactive visualization: .

Prepare a laboratory report as follows: the title page, the results of the trend analysis based on the indicators of the selected type of business, a general conclusion on the usefulness of using Google Trends in the work of business structures, a list of references (if necessary). Type the text of the report in the Arial format, font 14, line spacing 1.2. Sheet margins: 2 mm on each side.

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НАВЧАЛЬНЕ ВИДАННЯ

WEB-АНАЛІТИКА ДЛЯ БІЗНЕСУ

**Методичні рекомендації
до лабораторних робіт
для студентів усіх спеціальностей
першого (бакалаврського) рівня
(англ. мовою)**

Самостійне електронне текстове мережеве видання

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Відповідальний за видання *О. В. Раєвська*

Редактор *З. В. Зобова*

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Подано методичні рекомендації до виконання лабораторних робіт, метою яких є закріплення й поглиблення знань теоретичного та практичного матеріалу, набуття навичок із вебаналітики за допомогою сучасних вебресурсів.

Рекомендовано для студентів усіх спеціальностей першого (бакалаврського) рівня.

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