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Информация о владельце:

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MINISTRY OF SCIENCE AND HIGHER EDUCATION

OF THE RUSSIAN FEDERATION

Federal State Autonomous Educational Institution

higher education "NORTH CAUCASUS FEDERAL UNIVERSITY"

APPROVE

Acting Director of the Institute,

Candidate of Technical Sciences,

Associate Professor A.A. Porohnia

ASSESSMENT TOOLS FUND FOR DISCIPLINE

Data visualization

name of the discipline

Direction of training

Focus (profile) Year of

09.04.03 Applied Informatics

Knowledge Management

commencement of studies

2026

Form of study

full-time

Implemented in a semester

1

Introduction

1. Purpose: FOS is intended for an objective assessment of the level formation of competencies.

2. FOS is an appendix to the program of the discipline "Data visualization"

3. Developer Orlova A.Yu., associate professor.

4. An examination of the FOS was carried out. Members of the expert group:

Chairman Azarov I.V., Acting Director of the Department

Members of the commission:

Amirokov S.R., Associate Professor

Orlinskaya O.G., Associate Professor

Representative of the employer organization Cherevko S.A., General Director of
KRAFTKOD LLC (Full name, position)

Expert opinion: FOS for the discipline allows to assess the level of formation of competencies. Proceed to testing.

5. The validity period of the FOS is determined by the period of implementation of the educational program.

1. Description of the criteria for assessing competence in various stages of their formation, description of assessment scales

Levels formation and competencies, indicator(s)	Descriptors			
	Minimum level not reached (Unsatisfactory) O) 2 points	Minimum level (satisfactory) O) 3 points	Intermediate level (Fine) 4 points	High level (Great) 5 points
UK-3 ID-1 UK-3. manage knowledge subject areas on practice. ID-2 analyze information subject areas. ID-3 synthesize information subject areas. UK-5 ID-1 find UK-3.	Difficulty managing knowledge of the subject areas in practice Difficulty analyzing information subject area Difficulty synthesizing information subject area It's hard to find information from	Poorly managed knowledge subject areas on practice Poorly analyzes information subject areas. Poorly synthesizes information subject areas It's hard to find information from	Mostly controls knowledge subject areas on practice Mostly analyzes information subject areas. Mostly synthesizes information subject areas Mostly finds	controls knowledge subject areas on practice analyzes information subject areas. synthesizes information subject areas finds information from
UK-5. information from different sources. ID-2 process information from different sources. ID-3UK-5. analyze information from different sources. OPK-3 ID-2 OPK-3. highlight V professionally you information The main thing introduce view analytical reviews justified conclusions. And ID-3OPK-3. structure, to design and represent in	With difficulty processes information from different sources Difficulty analyzing information from different sources It is difficult to distinguish in a professional setting information main and presents it in the form of analytical reviews justified conclusions With recommendations WITH by labor	Weak processes information from different sources Poorly analyzes information from different sources It is weakly secreted in professional information The main thing represents in the form of analytical reviews justified conclusions Weak	information from different sources Mostly processes information from different sources Mostly analyzes information from different sources IN basically highlights V professionally y information The main thing And represents V view analytical reviews With justified conclusions And reviews justified conclusions recommendations IN basically structures,	different sources processes information from different sources sources analyzes information from different sources sources highlights V professionally y information The main thing And represents V view analytical reviews With justified conclusions And recommendations structures, designs And represents in the

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The assessment of the level of development of competence in the discipline is carried out on the basis of the "Regulations on the current monitoring of academic performance and midterm assessment of students in higher education programs - bachelor's degree programs, specialist programs, master's degree programs - at the federal state autonomous educational institution of higher education "North Caucasus Federal University" in the current version.

ASSESSMENT TOOLS FOR CHECKING THE LEVEL OF COMPETENCY DEVELOPMENT

Number tasks	Correct answer	Contents of the question	Competence
		Full-time education, semester 1	
1.	2	BigData is... - the presentation of facts, concepts, or instructions in a form suitable for interpretation or processing - a comprehensive set of methods for processing structured and unstructured data of enormous volumes - the colossal amount of data collected by humanity - class in Java, designed to store data from 100 GB	UK-3
2.	3	The core skill of a data scientist is: - the ability to find the most important elements in stored information - be able to predict the outcome of the system - find hidden logical connections in the system of collected information - distinguish unstructured data from structured data	UK-3
3.	2	What does the term "Business Intelligence" mean in information technology? - a comprehensive set of methods for creating business plans - methods and tools for converting raw information into a meaningful, easy-to-perceive form - files containing information about the business plan - technologies aimed at business development	UK-3
4.	1	What is the main outcome of the Business Intelligence process? - the ability to make business decisions - Results of data mining - the possibility of using artificial intelligence - obtaining data structuring after completing all steps of the process	UK-3
5.	1	What algorithm can be used to find an association rule: - apriori algorithm - k-means algorithm - c-means algorithm - hierarchical algorithm	UK-3
6.	2	The main goal of statistical analysis: - search for the general population - determining the properties of the general population - comparison of general populations - identifying the sequence of the input set	UK-3

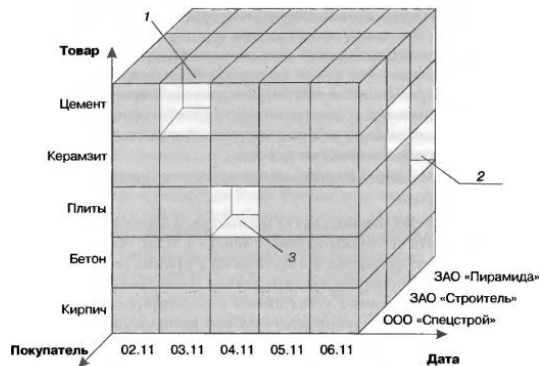
7.	3	Data warehouse is: 1. a domain-specific, integrated, immutable, time-based data set organized for decision support purposes 2. a model of a certain subject area, consisting of interconnected data about objects, their properties and characteristics 3. a system that has the properties of input, storage and analysis of data related to a certain subject area, with the purpose of finding solutions 4. it is an ordered set of information that is stored electronically in a computer system	UK-3
8.	1, 2, 3	Highlight the properties of the data warehouse: 1.subject orientation 2.integration 3.chronology support 4. immutability 5.admission of data redundancy 6.priority of system characteristics.	UK-3
9.	2	For which systems is high performance and data availability a priority: 1. decision support system 2. OLTP system 3.database management system 4.economic information system 5.information retrieval system	UK-3
10.	1	The main purpose of OLAP systems: 1.discovery of hidden knowledge and patterns 2. support of analytical activities 3. support for user-analyst queries 4. data entry and storage	UK-3
11.	2	A time series is: 1.a temporarily created set of data 2. time-ordered values of the indicator 3. a series of data obtained by calculation in a short period of time 4. data set for research	UK-3
12.	3	The purpose of cluster analysis is - 1. to form groups of similar objects	UK-3

		2. division into groups according to certain characteristics 3. distinguishing objects of observation by some features 4. Extracting the most important factors from groups of data	
13.	2, 4	A set of models used together to solve a single problem is called ... models. 1. base 2. ensemble 3. unification 4. committee	UK-3
14.	3	In paired regression, the relationship between x and y is called inverse if: 1. as x decreases, 2. when x decreases, y increases 3. as x increases, y increases 4. when x increases, y does not change	UK-3
15.	3	The average approximation error characterizes: 1. the average change in 2. average change ε 3. average deviation of theoretical y from initial y 4. average change x	UK-3
16.	Business intelligence is a technology- based method that helps analyze data and provide useful information that helps corporate executives, business managers, and other users make critical business decisions.	What is BI?	UK-5
17.	Power BI is tool business-analytics and data visualization that helps transform data from various data sources into interactive BI dashboards and reports. It provides several software connectors and services.	What is Power BI?	UK-5
18.	Here four main reasons using Power BI tool: Ready-made dashboards and reports for SaaS solutions.	Why use Power BI?	UK-5

	Power BI allows you to update your dashboard in real time. Provides secure and reliable connectivity to your data sources in the cloud or on-premises Power BI offers fast deployment, hybrid configuration and secure environment. Helps you explore data using natural language query		
19.	Important components Power BI are: 1) Data Integration, 2) Data Processing and 3) Data Presentation	What are the important components of Power BI?	UK-5
20.	It is a formula expression language called (DAX) that can be used With various visualization tools such as Power BI. It is also known as a functional language, where the complete code is stored inside a function.	What is the Dax function?	UK-5
21.	Dax data types: 1) Numeric, 2) Boolean, 3) Date and Time, 4) String, 5) Decimal.	What are the Dax data types?	UK-5
22.	Power BI is primarily used for: Project Management business analysis and data development and administration of the database, presentation of the report to the end user	What are the main uses of Power BI?	UK-5
23.	Three important power BI tools: Power BI Desktop—used for desktop computers	Name three important Power BI tools	UK-5

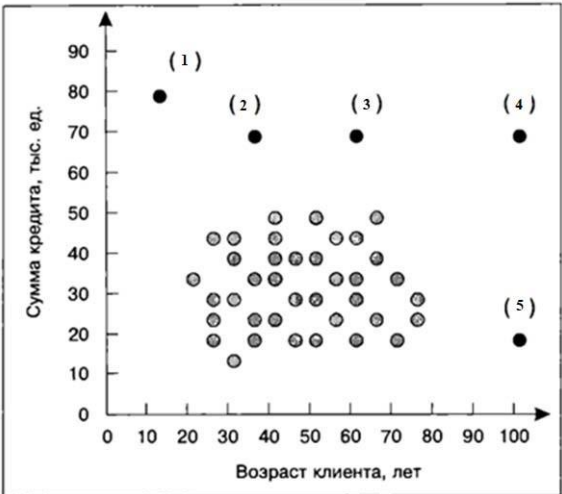
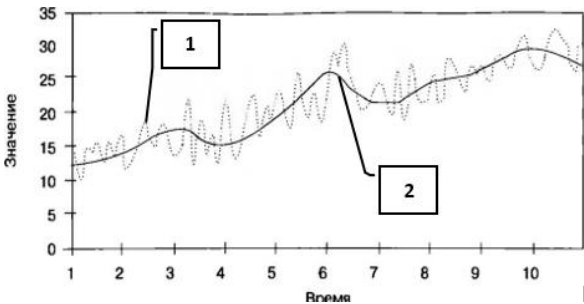
	Power BI service is online-software as a service tool Power BI mobile apps—these are used for iOS and Android devices.		
24.	This language programming, used in Power Query. It is a functional, case-sensitive language that is similar to other programming languages and easy to use.	Define the term “language M”.	UK-5
25.	Power query-this tool ETL, which helps you cleanse, to form And change data, using instinctive interfaces without doing anything.	What is Power Query?	UK-5
26.	An on-premises gateway acts as a bridge that helps you transfer data that is on-premises (not in the cloud) securely and reliably.	What is a local gateway?	UK-5
27.	Two type modes connections, used in Power BI: Import Direct request	Name the two types of connection modes in Power BI?	UK-5
28.	Important Power BI report filters include: Visual Level Filters Page Level Filters Report Level Filters	What types of filters are available in Power BI reports?	UK-5
29.	The Power BI service includes a publish to web option that will generate a link address for your Power BI report. You can share these links with others.	What is embed code?	UK-5

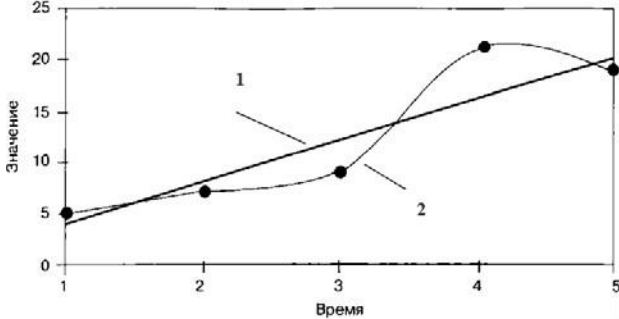
30.	Sum, Max, AVG, Distinct, Count, Calculate, Datediff are some important widely used DAX functions.	Name some important DAX functions used in Power BI.	UK-5
31.	The INDEX function will help you get the index of the corresponding row.	How to use INDEX function in Power BI?	UK-5
32.	3	If the coefficient of pairwise linear correlation $r = -1$, this means 1. there is no connection between x and y 2. there is a slight connection between x and y 3. there is a significant relationship between x and y 4. there is a functional relationship between x and y	UK-5
33.	1, 2, 4	Name the factors that determined the emergence and development of Data Mining: 1. improvement of hardware and software 2. improvement of data storage and recording technologies 3. accumulation of a large amount of retrospective data 4. improvement of information processing algorithms 5. the need to replace the analyst with information technology	UK-5
34.	4	The main purpose of intelligent analysis systems (Data Mining): 1. detection of hidden knowledge in raw data 2. conducting statistical analysis 3. solutions to mathematical programming problems 4. search for aggregated data	UK-5
35.	3	Rate the correctness of the statement: "Data Mining can replace analytics" 1. the statement is true 2. The statement is incorrect. Technology cannot provide answers to questions that have not been asked. 3. The statement is incorrect. Technology only gives the analyst a tool to make his work easier and better.	OPK-3
36.		Open-ended tasks	OPK-3
37.	1. Cell 1 contains facts related to the sale of cement on November 3 by the buyer, Spetsstroy LLC. 2. Cell 2 contains facts related to the sale of a slab on November 6 by the buyer, ZAO Pyramid. 3. Cell 3 contains facts related to the sale of a slab on November 4 by the buyer, Spetsstroy LLC.	The figure shows a multidimensional cube.	OPK-3

		 Write down which facts are located in cells 1, 2, 3, according to the dimensions Date, Product, Buyer. Use the sentence template for this. Cell 1 contains facts relating to the sale of (date) (goods) by buyer					
38.	1, 2, 5, 7	Select from the list the main basic tasks of Data Mining: 1.classification 2.regression 3.transformation 4.diagnostics 5.clustering 6.interpretation 7. association	OPK-3				
39.	1 – B 2 – G 3 – A 4 – B	Match the name of the basic Data Mining tasks with their definition. <table><tr><td>1.Classification and I</td><td>A. This is a group. objects based on data, describing properties of objects</td></tr><tr><td>2.Regression</td><td>B. this is an establishment dependencies discrete day off</td></tr></table>	1.Classification and I	A. This is a group. objects based on data, describing properties of objects	2.Regression	B. this is an establishment dependencies discrete day off	OPK-3
1.Classification and I	A. This is a group. objects based on data, describing properties of objects						
2.Regression	B. this is an establishment dependencies discrete day off						

				variable input variables	from		
				3. Clustering I	IN. n regularities between related objects		
				4.Association	G. is an establishment dependencies continuous day off variable input variables	n fr	
40.	formalized, heuristic, complex			Insert the missing methods into the sentence. All forecasting methods can be divided into three large groups:			OPK-3
41.	stacking			Insert the missing word into the sentence. Layered generalization, or simply ..., is one way to create composite models.			OPK-3
42.	Strategy development achieving the goal	2		Based on the composition of the elements of the control system and their logical relationship, establish in the table the order of the sequence of designing the control system “from scratch”:			OPK-3
	Defining objects management	4					
	Formulation the highest organizations	1		Strategy development achieving the goal	?		
	Formation regulating and methodical documentation	7		Defining objects management	?		
				Formulation the highest organizations	?		
	Automation control systems (if necessary)	8		Formation regulating and methodical documentation	?		

	Formation top systems level indicators goals and	3		Automation control systems (if necessary)	?		
	Development models business processes, formation	5		Formation top systems level indicators goals and	?		
	lower level systems goals and indicators			Development models business processes, formation	?		
	Design organizational structures	6		lower level systems goals and indicators			
				Design organizational structures	?		
43.	Solution: 1 - O 2 – P 3 – P 4 – O 5 - O		Finding anomalies and potentially removing them from data sets can be described as the process of selecting values that are very different from the surrounding data, outliers, or inconsistent with the rest of the data. The task of detecting anomalies, especially in high-dimensional observations, is complex. The figure shows two types of anomalies marked with numbers. Mark obvious errors with the letter "O", and mark suspicious values that do not generally contradict the logic of the data with the letter "P".			OPK-3	

		 Scatter plot showing the relationship between the age of a client (x-axis, 0 to 100 years) and the sum of credit (y-axis, 0 to 90 thousand rubles). The plot contains many data points, mostly clustered between 20 and 80 years of age and 10 to 50 thousand rubles of credit. Five specific points are labeled: (1) at approximately (15, 80), (2) at (35, 70), (3) at (60, 70), (4) at (100, 70), and (5) at (100, 20).	
44.	1 - random component 2 – deterministic component	Identify the deterministic and random components of the time series in the figure. 1 - ? 2 - ?  Time series plot showing the value (y-axis, 0 to 35) over time (x-axis, 1 to 10). The plot displays a clear upward trend with a peak around time 6, followed by a slight decline and then a rise. A smooth curve (deterministic component) is overlaid on the data, and a noisy line (random component) is also shown, representing the fluctuations around the trend.	OPK-3

45.	1 - trend 2 – cyclic component	Identify the components of the time series in the figure. 1 - ? 2 - ? 	ОПК-3
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