

CHAPTER 09 | EXERCISE SOLUTIONS

Data Science and Data Gathering

Computer Science and Entrepreneurship
9th Class

MCQs with Explanations * Short Questions * Long Questions



scholareye.xyz



Multiple Choice Questions (MCQs)

Q1. What is data?

- a) Processed information
- b) Raw facts gathered about things** 
- c) A collection of numbers only
- d) A list of observed events

Explanation: Data consists of raw, unorganized facts that need to be processed. Once data is processed and given context, it becomes information. While data can be numbers or observed events, the core definition is raw facts.

Q2. Which of the following is an example of qualitative data?

- a) Temperature readings in degrees Celsius
- b) Number of students in a class
- c) Favourite ice cream flavours** 
- d) Test scores out of 100

Explanation: Qualitative data is descriptive and categorical. It deals with characteristics, attributes, or labels (like flavors), not numerical measurements. The other options are numerical (quantitative).

Q3. What type of data involves distinct, separate values that are countable?

- a) Nominal Data
- b) Ordinal Data
- c) Discrete Data**
- d) Continuous Data



Explanation: Discrete data can only take specific, distinct values (usually whole numbers) and is countable (e.g., number of students). Continuous data can take any value within a range.

Q4. What is an example of continuous data?

- a) Number of cars in a parking lot
- b) Height of students in centimetres**
- c) Types of fruits
- d) Shirt sizes (small, medium, large)



Explanation: Height is continuous because it can be measured to any level of precision (e.g., 150.5 cm, 150.51 cm). The other options are discrete, categorical, or ordinal.

Q5. What type of data is used to categorize items without implying any order?

- a) Ordinal Data
- b) Discrete Data
- c) **Nominal Data**
- d) Continuous Data



Explanation: Nominal data is used for labeling variables without any quantitative value or order (e.g., eye color, types of fruits). Ordinal data implies an order.

Q6. How can you organise data to make it easier to analyse?

- a) By writing it in long paragraphs
- b) **By creating tables, charts, and graphs**
- c) By storing it in random files
- d) By keeping it in a messy notebook



Explanation: Visual and structured representations like tables, charts, and graphs make it much easier to identify patterns, trends, and outliers in data compared to long paragraphs or messy notes.

Q7. Which tool can be used to create surveys online?

- a) Microsoft Word
- b) Google Forms**
- c) Excel Spreadsheets
- d) Adobe Photoshop



Explanation: Google Forms is specifically designed for creating and distributing online surveys and collecting responses.

Q8. What is the main purpose of data collection?

- a) To create random numbers
- b) To gather information to answer questions or make decisions**
- c) To delete old data
- d) To format text documents



Explanation: Data collection is the systematic process of gathering accurate information to answer research questions, test hypotheses, or make informed decisions.

Q9. What is the primary purpose of data visualization?

- a) To generate random numbers
- b) To convert text into data
- c) To make data easier to understand by turning it into pictures** 
- d) To hide complex data

Explanation: Data visualization uses visual elements like charts and graphs to make complex data more accessible, understandable, and usable.

Q10. Which tool is specifically designed for creating detailed and interactive visualizations?

- a) Microsoft Excel
- b) Google Sheets
- c) Tableau** 
- d) PowerPoint

Explanation: Tableau is a leading data visualization tool specifically built for creating highly detailed, interactive, and shareable dashboards and reports.

Q1 What is the first step in the data science process?
1.

- a) Data Cleaning
- b) Data Analysis
- c) Data Collection

d) Understanding the problem



Explanation: Before collecting or analyzing data, you must first understand the problem you are trying to solve to determine what data is needed.

Q1 What does the 'Volume' characteristic of Big Data
2. refer to?

- a) The speed at which data is generated
- b) The different forms data can take

c) The sheer amount of data being collected



d) The way data is processed

Explanation: In Big Data, 'Volume' refers to the massive scale or amount of data generated and stored.

Q1 What is an outlier in a dataset?
3.

- a) The most frequent value
- b) The average of all values
- c) An unusual or extreme value that doesn't fit the pattern** ✓
- d) The middle value when all values are arranged in order

Explanation: An outlier is a data point that differs significantly from other observations, often indicating variability or experimental error.

Q1 What does data encryption do?
4.

- a) It converts data into a code to prevent unauthorized access** ✓
- b) It makes data available to everyone online
- c) It automatically deletes old data
- d) It speeds up internet connection

Explanation: Encryption translates data into another form, or code, so that only people with the decryption key (password) can read it, securing it from unauthorized access.

Short Questions

1. What is the difference between qualitative and quantitative data?

Qualitative data describes qualities or characteristics and is non-numerical (e.g., colors, textures, flavors). Quantitative data is numerical and can be measured or counted (e.g., height, weight, number of items).

2. Give an example of continuous data and explain why it is considered continuous.

Example: Temperature or Height. It is considered continuous because it can take on any value within a given range, including fractions and decimals. For instance, temperature can be 30.1°C, 30.15°C, etc., with infinite possible values between two points.

3. Which method would you use to collect opinions from a large group of people about a new school policy?

A survey or questionnaire (e.g., using Google Forms) would be the most effective method to collect opinions from a large group efficiently and anonymously.

4. What type of data is the number of students in your class?

Discrete quantitative data, because the number of students is a countable whole number.

5. Why is it important to organise data into tables or charts before analyzing it?

Organizing data into tables or charts makes it easier to spot patterns, trends, and outliers. It simplifies complex datasets, making analysis faster and more accurate.

6. What is one advantage of using online tools like Google Forms for collecting survey data?

It automates data collection and compilation, instantly organizing responses into spreadsheets and charts, saving time and reducing human error.

7. Why might you need to integrate data from different sources when working on a project?

Integrating data from multiple sources provides a more comprehensive view of the problem, fills in gaps, and allows for more robust, accurate analysis and decision-making.

8. Describe a scenario where discrete data might be more useful than continuous data.

Counting the number of students absent from a class. You need whole numbers (0, 1, 2); a fraction like 1.5 students doesn't make sense.

9. Explain why data visualization is important. How does it help in understanding complex information?

Data visualization translates complex numerical data into visual formats like charts and graphs. This helps the human brain quickly identify patterns, trends, and outliers, making complex information much easier to understand and act upon.

10. Describe what a line graph is used for and provide an example of data that could be displayed using a line graph.

A line graph is used to display data that changes continuously over time (trends). Example: Tracking the daily temperature over a week or monthly sales figures over a year.

- 11. Explain the use of scatter plots in visualizing continuous data. Provide an example of a situation where a scatter plot would be useful.**

Scatter plots use dots to represent individual data points on a two-dimensional graph, showing the relationship or correlation between two continuous variables. Example: Plotting hours studied vs. exam scores to see if more study time leads to higher scores.

Long Questions

- 1. Explain the differences between qualitative and quantitative data. Provide examples of each type.**

Qualitative data is descriptive, categorical, and non-numerical, focusing on qualities (e.g., colors of cars, types of cuisine). Quantitative data is numerical, measurable, and countable, focusing on quantities (e.g., weight in kg, number of books). Qualitative answers "what kind?" while quantitative answers "how much/how many?"

- 2. Describe the process of conducting a survey to gather data about students' favourite extracurricular activities.**

Step 1. Define the objective.

Step 2. Design a questionnaire asking for their favorite activity.

Step 3. Select the target group (e.g., all students).

Step 4. Distribute the survey (e.g., via Google Forms).

Step 5. Collect responses.

Step 6. Organize and analyze the data using charts (e.g., bar chart) to identify the most popular activities.

3. Compare and contrast continuous and discrete data. Use examples to show how each type of data might be used in a school setting, such as in measuring student performance or tracking attendance.

Continuous data can take any value within a range and is measured (e.g., height, time spent studying). Discrete data consists of distinct, countable values (e.g., number of correct answers, attendance count). In a school, continuous data measures performance precisely (e.g., 85.5% on a test), while discrete data tracks things like the exact number of days a student was present or the number of A's earned.

4. Analyse the benefits and challenges of using digital tools like Google Forms for data collection.

Benefits: Fast distribution, automatic data compilation, cost-effective, accessible anywhere, easy to analyze with charts.

Challenges: Requires internet access, limited to those with digital literacy, potential for spam/duplicate entries, lack of personal interaction to clarify questions.

5. Imagine you are tasked with organizing a school event and need to collect data on students' preferences for activities and refreshments.

Step 1. Create a survey using Google Forms.

Step 2. Ask questions like "Which activity do you prefer? (Sports, Drama, Music)" and "What refreshment do you prefer? (Pizza, Snacks, Juice)".

Step 3. Share the form with students.

Step 4. Collect responses.

Step 5. Use bar charts to visualize the most popular choices.

Step 6. Make decisions based on the data (e.g., order enough pizza if that's the top choice).

6. Explain the role of tables and charts in data analysis. Provide an example of how you could use a table or chart to present data about students' grades in different subjects.

Tables and charts organize raw data into a readable format, making it easier to compare and analyze. A table could list student names and their grades in Math, Science, and English side-by-side. A bar chart could then be used to show the average grade per subject, quickly highlighting which subject students excel in or struggle with.

- 7. Describe a situation where non-numeric data is essential. How would you collect, store, and analyse this type of data? Discuss the tools and techniques you would use to ensure the data is accurately interpreted.**

Situation: Understanding customer feedback on a new product.

Collection: Conduct interviews or open-ended surveys.

Storage: Transcribe interviews, store text responses in a secure database.

Analysis: Use qualitative coding to categorize themes (e.g., "quality," "price," "usability").

Tools: Spreadsheets for categorizing, or qualitative analysis software (like NVivo).

Interpretation: Look for recurring themes to identify common praises or complaints.

- 8. Explain the concept of data visualization. How does it help in understanding complex data? Provide examples of different types of visualizations and their applications in real-life scenarios.**

Data visualization is the graphical representation of information and data. It helps understand complex data by utilizing human visual perception to detect patterns, trends, and outliers quickly. Examples: Line graphs (stock market trends), Bar charts (sales comparisons), Pie charts (market share), Scatter plots (correlation between variables).

- 9. Discuss the importance and benefits of data visualization. Why is it essential for businesses and decision-makers to use charts, graphs, and dashboards?**

It is essential because it simplifies complex data, allowing decision-makers to grasp insights quickly without needing deep statistical knowledge. Benefits include faster decision-making, better identification of trends, enhanced communication of findings, and the ability to monitor key performance indicators (KPIs) in real-time through dashboards.

- 10. Differentiate between nominal, ordinal, discrete, and continuous data. For each type, describe a suitable visualization technique and provide a specific example of how this technique can be used to represent that type of data effectively.**

Nominal: Categorical, no order (e.g., Blood types).

Visualization: Bar chart or Pie chart (shows frequency of A, B, AB, O).

Ordinal: Categorical, with order (e.g., Satisfaction levels:

Poor, Fair, Good, Excellent). Visualization: Bar chart (ordered logically) or a Likert scale chart.

Discrete: Countable whole numbers (e.g., Number of children in families). Visualization: Bar chart or Histogram (shows counts).

Continuous: Measurable, any value in a range (e.g., Weight).

Visualization: Histogram, Line graph, or Scatter plot (shows distribution or trends over time).



THANK YOU!

Keep Learning, Keep Growing

You have completed Chapter 09:
Data Science and Data Gathering

scholareye.xyz

Visit us for more notes, MCQs and exercise solutions

