Python Institute
PCED

PCED: Python Institute Certified Entry-Level Data Analyst with Python (PCED-30-02)

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Product Version

Latest Version: 6.0

Question: 1

You're tasked with collecting customer feedback on a new product launch. Which data collection method would be most appropriate for gathering qualitative insights into customer experiences and emotions, while also allowing for open-ended responses?

A. Surveys
B. Web Scraping
C. Interviews
D. Social Media Monitoring
E. AIB Testing

Answer: C

Explanation:
Interviews are the most appropriate method for collecting qualitative data, as they allow for in-depth exploration of customer experiences and emotions through open-ended questions and discussions. Surveys can be useful for gathering quantitative data but are less effective for capturing nuanced insights. Web scraping is used for extracting data from websites, social media monitoring tracks public sentiment, and AIB testing focuses on comparing different versions of a product or feature.

Question: 2

You want to gather information about the popularity of different types of online games. Which web scraping technique would be most effective in extracting this data from a gaming website, assuming the website structure is consistent across game pages?

A. Using regular expressions (regex) to extract specific text patterns from HTML code.
B. Employing a web scraping library like Beautiful Soup to parse the HTML content and extract specific elements based on their tags and attributes.
C. Utilizing Selenium to automate a web browser and interact with the website to fetch dynamic data loaded through JavaScript.
D. Directly accessing the website's API (Application Programming Interface) to obtain structured data.
E. Using a web scraper extension in a web browser to extract data.

Answer: B

Explanation:
Beautiful Soup is a Python library specifically designed for parsing HTML and XML content, making it ideal for extracting specific data from websites with consistent structures. While other methods can also be effective, Beautiful Soup is generally the most efficient and straightforward for this task. Regular expressions (A) are useful for finding specific patterns in text but can be less flexible for complex HTML structures. Selenium (C) is suited for interacting with dynamic websites, but it might be overkill for this

scenario. Accessing the API (D) is preferable if available, but it might not be exposed for public data retrieval. Browser extensions (E) offer convenience but lack the flexibility and control of Python libraries.

Question: 3

You're conducting a survey to assess customer satisfaction with a company's services. Which of the following best describes the potential pitfalls of using a closed-ended question format, like multiple-choice or rating scales, in your survey?

A. Closed-ended questions limit respondents to pre-defined answers, potentially missing out on valuable nuanced opinions and unexpected feedback.
B. Closed-ended questions can introduce bias due to the wording and order of options, influencing respondents' choices.
C. Closed-ended questions are more difficult to analyze and interpret compared to open-ended questions, making it harder to draw meaningful conclusions.
D. Closed-ended questions can lead to respondents feeling restricted and less engaged with the survey, reducing response rates.
E. All of the above.

Answer: A,B,D

Explanation:
All of the mentioned options accurately describe potential pitfalls of using closed-ended questions in a survey. These questions can miss out on rich, nuanced feedback, introduce bias, and reduce respondent engagement. While closed-ended questions offer the advantage of easily quantifiable data, it's crucial to consider these limitations and supplement them with open-ended questions or qualitative data collection methods to gain a comprehensive understanding of customer satisfaction.

Question: 4

You are tasked with analyzing customer feedback data to improve a product's user experience. Your team decides to use a survey to collect feedback. Which of the following sampling methods would be most appropriate to ensure a representative sample of diverse user opinions?

A. Simple random sampling
B. Stratified sampling
C. Convenience sampling
D. Snowball sampling
E. Quota sampling

Answer: B

Explanation:
Stratified sampling is the most appropriate method for this scenario. It ensures that the sample reflects the different user demographics (e.g., age, gender, location, experience level) and allows for a more balanced representation of opinions across various user groups. Simple random sampling might not

capture the full range of user perspectives, while convenience sampling, snowball sampling, and quota sampling can introduce bias and limit representativeness.

Question: 5

You are building a data pipeline to collect data from multiple sources, including a web API, a database, and CSV files. Which of the following Python libraries are essential for this task?

A. NumPy
B. Pandas
C. requests
D. SQLAlchemy
E. Scikit-learn

Answer: B,C,D

Explanation:
Pandas is a powerful library for data manipulation and analysis, providing tools for reading data from various sources, including CSV files, and for manipulating dataframes. The 'requests' library allows you to interact with web APIs, making it crucial for collecting data from external sources. SQLAlchemy is a database toolkit that enables you to connect to and query databases efficiently. NumPy is primarily used for numerical computations and array operations and is not essential for data collection itself. Scikit-learn is a machine learning library and is not directly related to data acquisition.

Question: 6

You are conducting a research study to understand the factors influencing customer satisfaction with a new product. You collect data through customer interviews and focus groups. What type of research approach are you employing?

A. Quantitative research
B. Qualitative research
C. Mixed methods research
D. Experimental research
E. Descriptive research

Answer: B

Explanation:
Customer interviews and focus groups are methods of collecting qualitative data, aiming to understand subjective experiences, opinions, and insights. Qualitative research focuses on exploring and interpreting data in a non-numerical form, allowing for a deeper understanding of complex phenomena. Quantitative research, on the other hand, relies on numerical data and statistical analysis.

Question: 7

You are tasked with collecting data on customer satisfaction with a new product. You plan to use a combination of online surveys and focus groups. Which of the following ethical considerations should you prioritize during the data collection process?

A. Ensuring that participants understand the purpose of the study and their rights to privacy.
B. Obtaining informed consent from all participants before collecting data.
C. Protecting the confidentiality of participant data and avoiding sharing it without permission.
D. Using clear and unbiased language in surveys and focus group questions.
E. All of the above.

Answer: A,B,C,D,E

Explanation:
All the listed options are crucial ethical considerations in data collection. It's essential to inform participants about the study's purpose and their right to privacy, obtain informed consent, protect data confidentiality, and use clear and unbiased language to avoid influencing responses. Ethical data collection practices build trust and ensure the integrity of research findings.

Question: 8

You are working on a project that requires integrating data from two separate sources: a customer database stored in a SQL server and a website analytics platform using a REST API. Which Python libraries would be most helpful in this scenario?

A. pandas, requests
B. NumPy, scikit-learn
C. matplotlib, seaborn
D. PyTorch, TensorFlow
E. BeautifulSoup, Scrapy

Answer: A

Explanation:
The 'pandas library is excellent for working with structured data from SQL databases, providing data manipulation and analysis capabilities. The 'requests' library is used to interact with REST APIs to retrieve data from web services. These two libraries are crucial for data integration from different sources. Option B focuses on numerical computation and machine learning, C on data visualization, D on deep learning, and E on web scraping, which are not the primary tools for this integration scenario.

Question: 9

Consider the following Python code snippet for data cleaning:

```
import pandas as pd

data = {'Name': ['Alice', 'Bob', 'Charlie', 'David'], 'Age': [25, '30', 35, 40], 'City': ['New York', 'London', 'Paris',' '], 'Salary': [50000, 60000, 70000, 80000]}

df = pd.DataFrame(data)

df['Age'] = df['Age'].astype(int)

df['City'] = df['City'].str.strip()
print(df)
```

Which of the following statements accurately describe the code's functionality and its impact on the DataFrame?

A. The code converts the 'Age' column to integer data type, removing any non-numeric values.
B. The code removes leading and trailing whitespaces from values in the 'City' column.
C. The code handles missing values by replacing them with the mean value for each column.
D. The code removes duplicate rows from the DataFrame.
E. The code sorts the DataFrame in ascending order based on the 'Age' column.

Answer: A,B

Explanation:
The code snippet performs the following data cleaning tasks: Line 5: 'df['Age'] = : This line attempts to convert the 'Age' column to integer data type. If the column contains any non-numeric values, it will raise an error. It does not remove non-numeric values, it attempts to convert them. Line 6: 'df['City'] = This line removes leading and trailing whitespace from the 'City' column. It does not remove any missing values from the DataFrame. Options C, D, and E are incorrect as the code snippet does not address missing values, duplicate rows, or sorting.

Question: 10

You are tasked with collecting data for a research study on customer preferences for a new product line. You have decided to use a combination of online surveys and focus groups. Which of the following BEST describes the advantages of this combined approach for collecting data on customer preferences?

A. Online surveys provide qualitative insights, while focus groups offer quantitative data.
B. Focus groups are more cost-effective than online surveys, but online surveys reach a wider audience.
C. Online surveys offer anonymity, while focus groups allow for in-depth discussion and exploration of customer motivations.
D. Both online surveys and focus groups provide a balanced mix of quantitative and qualitative data, offering a more comprehensive understanding of customer
E. Online surveys are less time-consuming than focus groups, while focus groups are more engaging for participants.

Answer: D

Explanation:
The correct answer is D. combining online surveys and focus groups offers a balanced mix of quantitative and qualitative data. Online surveys provide structured data on preferences, while focus groups allow for in-depth exploration of customer motivations and feedback. This combined approach provides a more comprehensive understanding of customer preferences than using either method

alone. Option A is incorrect because online surveys typically offer quantitative data (e.g., ratings, choices), while focus groups provide qualitative insights (e.g., opinions, discussions). Option B is incorrect because focus groups are generally more expensive than online surveys, and online surveys can reach a broader audience. Option C is partially correct but incomplete. While online surveys can offer anonymity, focus groups allow for in-depth exploration of customer motivations. However, focus groups may not always provide anonymity, and online surveys can also be used for qualitative data. Option E is partially correct, but incomplete. Online surveys are generally less time-consuming, and focus groups are more engaging. However, the time required for both depends on various factors.

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