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**ASSIGNMENT QUESTIONS**

**1) What are the Applications of Data Analytics in your field (Software Engineering)**

Here are some key applications in Software Engineering:

1. **Bug Detection and Prevention**: By analyzing historical bug data and patterns, data analytics can predict potential, allowing developers to address them before they become problematic.

2. **Performance Optimization**: Data analytics helps in monitoring software performance by identifying bottlenecks and inefficiencies. This leads to more efficient and faster software applications.

3. **User Behavior Analysis**: Understanding how users interact with software can guide design and functionality improvements. Data analytics provides insights into user preferences, common issues, and feature usage, helping tailor the software to meet user needs better.

4. **Resource Management**: By analyzing data on resource usage, such as CPU, memory, and network bandwidth, software engineers can optimize resource allocation to ensure smooth and efficient operation.

5. **Customer Feedback Analysis:** Analyzing customer feedback and reviews can provide insights into the strengths and weaknesses of the software, guiding future development and

enhancements.

**2) 20 Shortcuts in Microsoft Excel**

1. Ctrl + N: Create a new workbook

2. Ctrl + O: Open an existing workbook

3. Ctrl + S: Save the current workbook

4. Ctrl + P: Print the current worksheet

5. Ctrl + Z: Undo an action

6. Ctrl + Y: Redo an action

7. Ctrl + C: Copy selected cells

8. Ctrl + V: Paste copied cells

9. Ctrl + X: Cut selected cells

10. Ctrl + F: Find in the worksheet

11. Ctrl + H: Replace in the worksheet

12. Ctrl + A: Select all cells in the worksheet

13. Ctrl + B: Apply or remove bold formatting

14. Ctrl + I: Apply or remove italic formatting

15. Ctrl + U: Apply or remove underline formatting

16. Ctrl + D: Fill down the selected cell(s)

17. Ctrl + R: Fill right the selected cell(s)

18. F2: Edit the active cell

19. F4: Repeat the last action

20. Ctrl + Arrow Keys: Move to the edge of the data region

**3) 20 Formulas in Excel**

1. SUM: `=SUM (A1:A10) ` – Adds all the numbers in a range of cells.

2. AVERAGE: `=AVERAGE (B1:B10) ` – Calculates the average of a range of cells.

3. COUNT: `=COUNT (C1:C10) ` – Counts the number of numeric entries in a range.

4. COUNTA: `=COUNTA (D1:D10) ` – Counts the number of non-empty cells in a range.

5. IF: `=IF(E1>10, "Yes", "No”) ` – Performs a logical test and returns one value if true, another if false.

6. VLOOKUP: `=VLOOKUP (F1, A1:B10, 2, FALSE) ` – Looks for a value in the first column of a range and returns a value in the same row from a specified column.

7. HLOOKUP: `=HLOOKUP (G1, A1:D4, 3, TRUE) ` – Searches for a value in the top row of a range and returns a value in the same column from a specified row.

8. INDEX: `=INDEX (A1:C10, 5, 2) ` – Returns the value of a cell in a specified row and column.

9. MATCH: `=MATCH (H1, A1:A10, 0) ` – Searches for a specified value in a range and returns the relative position of that item.

10. LEN: `=LEN(I1) ` – Returns the number of characters in a text string.

11. CONCATENATE: `=CONCATENATE (J1, " ", K1) ` – Joins several text strings into one text string.

12. TRIM: `=TRIM(L1) ` – Removes all spaces from a text string except for single spaces between words.

13. LEFT: `=LEFT (M1, 3) ` – Returns the first specified number of characters from the start of a text string.

14. RIGHT: `=RIGHT (N1, 4) ` – Returns the last specified number of characters from the end of a text string.

15. MID: `=MID (O1, 2, 5) ` – Returns a specific number of characters from a text string, starting at the position you specify.

16. NOW: `=NOW () ` – Returns the current date and time.

17. TODAY: `=TODAY () ` – Returns the current date.

18. DATEDIF: `=DATEDIF (P1, Q1, "D”) ` – Calculates the difference between two dates.

19. RANK: `=RANK (R1, S1:S10) ` – Returns the rank of a number in a list of numbers.

20. ROUND: `=ROUND (T1, 2) ` – Rounds a number to a specified number of digits.

**4) Descriptive analysis of the data**.

1. - The total number of job fields represented is 7.
2. - The Engineering job field has donations from both male and female donors, indicating gender diversity.
3. - The dataset contains 1000 records of donations.
4. - Each entry includes details like donor name, email, gender, job field, donation amount, state, and shirt size.
5. - The gender distribution is skewed towards males (Approximately 60% Males).

**5) 10-Analytical questions of the data.**

1. Which gender contributes the most in donations overall?

```SQL

SELECT gender, SUM(donation) AS total\_donation

FROM Donation\_Data

GROUP BY gender

ORDER BY total\_donation DESC;

```

2. What is the average donation amount by job field?

```SQL

SELECT job\_field, AVG(donation) AS average\_donation

FROM Donation\_Data

GROUP BY job\_field;

```

3. How many donors are from each state?

```SQL

SELECT state, COUNT(id) AS donor\_count

FROM Donation\_Data

GROUP BY state;

```

4. Which job field has the highest total donations?

```SQL

SELECT job\_field, SUM(donation) AS total\_donation

FROM Donation\_Data

GROUP BY job\_field

ORDER BY total\_donation DESC

LIMIT 1;

```

5.What is the distribution of donations across different states?

```SQL

SELECT state, SUM(donation) AS total\_donation

FROM Donation\_Data

GROUP BY state;

```

6. What is the most common shirt size among donors?

```SQL

SELECT shirt\_size, COUNT(\*) AS frequency

FROM Donation\_Data

GROUP BY shirt\_size

ORDER BY frequency DESC

LIMIT 1;

```

7. Which state has the highest average donation amount?

```SQL

SELECT state, AVG(donation) AS average\_donation

FROM Donation\_Data

GROUP BY state

ORDER BY average\_donation DESC

LIMIT 1;

```

8. What percentage of donors work in Human Resources?

```SQL

SELECT COUNT(\*) \* 100.0 / (SELECT COUNT(\*) FROM Donation\_Data) AS percentage\_hr

FROM Donation\_Data

WHERE job\_field = 'Human Resources';

```

**6) A list of 15 Python functions and modules**

**FUNCTIONS**

1. print(): Displays the specified message on the screen.

2. len(): Returns the length of an object.

3. range(): Generates a sequence of numbers.

4. type() : Returns the type of an object.

5. int() : Converts a value to an integer.

6. str() : Converts a value to a string.

7. list() : Converts a value to a list.

8. dict() : Creates a dictionary.

**MODULES**

9. math: Provides mathematical functions like `math.sqrt()`, `math.sin()`, `math.factorial()`, etc.

10. os : Interacts with the operating system, useful for file and directory operations.

11. sys: Provides access to some variables used or maintained by the interpreter and to functions that interact strongly with the interpreter.

12. datetime : Supplies classes for manipulating dates and times.

13. random: Implements pseudo-random number generators for various distributions.

14. re: Supports regular expression operations.

15. json: Enables JSON serialization and deserialization.