CS6.201: Introduction to Software Systems

International Institute of Information Technology, Hyderabad

QUIZ – 2 **Duration: 45 Minutes** **Total Marks: 30**

Please use the empty space to answer your questions

ROLL NUMBER: _____

Q1: Answer the following questions consider GIT as the underlying tool.

(a) Your teammate updates the `codebase()` function and pushes the changes; you later modify the same function locally without pulling their changes. What happens when you push, and how can you resolve it? **[0.5 Marks]**

(b) You modify 15 files in a repository with 100 files and run the following commands:

```
git commit -m "I made some changes"
git push
```

However, when you open GitHub, you don't see the changes. What do you think could have gone wrong? **[0.5 Marks]**

(c) Write the git command to switch from the `master` branch to the `testing` branch. **[0.5 Marks]**

(d) What is the command to undo the last commit while keeping your changes? **[0.5 Marks]**

Q2: Answer the following questions using BASH

(a) Write a command to display the first 5 lines of `data.txt`. [Hint: Use your head] **[1 Mark]**

(b) Use sed to replace every occurrence of ***'HTML'*** with ***'CSS'*** in input.txt. **[1 Mark]**

(c) Print only lines 5 to 10 from `report.txt` using `sed`**. [1 Mark]**

(d) Write a Bash script that takes a filename as input and prints its line count. Ensure it handles non-existent files gracefully. **[2 Marks]**

Q3: A company maintains an employees table with the details mentioned in the table below.

Column Name	Data Type	Description
id	INT	Unique identifier for each employee
name	VARCHAR	Employee's full name
department	VARCHAR	Department where the employee works
salary	INT	Employee's salary

(a) Write an SQL query to retrieve the **names** and **salaries** of employees in the Engineering department who earn more than 50,000. **[1 Mark]**

(b) Write an SQL query to find the average salary of employees for each department, sorted in descending order of average salary. **[1 Mark]**

(c) Write a MongoDB query to find an employee with `name` as `"John Doe"` and increase their salary by `10,000` in the `employees` collection, which contains fields `_id, name, age, department, and salary`. **[1 Mark]**

(d) Write a MongoDB aggregation query to calculate the total revenue from orders where status is "delivered" in the orders collection, which contains the fields `customer_name, total_price`, and `status ("pending", "shipped", "delivered")`. **[2 Marks]**

Q4: Answer the following questions using file handling in Python

(a) Excluding `read` and `write` modes, list four different modes used with the `open()` function in Python and mention the character used to specify each mode. Also, provide a one-line explanation of what each mode does. Please avoid mentioning combinations of these modes, as they will not be considered different modes. **[2 Marks]**

(b) Explain why using the `readlines()` function to read a large file can be inefficient **[1 mark]**. Suggest a more efficient method for reading large files. **[1 Mark]**

(c) Why is it important to close files in Python? Provide one reason **[1 Mark]**. Additionally, explain how the `with` statement ensures proper resource management in Python, and support your explanation with an example **[1 Mark]**

Q5: Using NumPy and Matplotlib answer the following questions:

Given the matrix A defined as follows:

```
A = np.array([
[0.25, 0.56, 0.98, 0.13, 0.72],
[0.43, 0.15, 0.67, 0.89, 0.24],
[0.91, 0.78, 0.64, 0.38, 0.55],
[0.19, 0.82, 0.13, 0.29, 0.71]
])
```

Note: Assume NumPy has already been imported as np, the array A has already been defined, and matplotlib.pyplot has been imported as plt.

(a) What will be the output of command `print(A.ndim)` and `print(A.size)` when executed on the matrix A defined above? **[1 Mark]**

(b) What will the output be when performing the slicing operation `A[::-1, ::2]` on the matrix A as defined above? Explain what this slicing operation is doing. **[2 Marks]**

(c) Write the code to create a 2×2 grid of subplots using the `plt.subplot()` or the `plt.subplots()` function. You can choose any type of plot or a combination of different types, such as scatter plots, line plots, images, etc. Ensure that the syntax is correct for the chosen plot types. **[2 Marks]**

Q6: Using HTML and CSS answer the following questions:

(a) Creating an Input Form: Write an HTML form with post action containing the fields: Name (text input, required), Email (email input, required), Age (number input, minimum age 18), and a submit button named submit. Fill in the blanks. **[1 Mark]**

```
<form action=”/submit” method=”_____________________________”>

<label for="name">Name:</label>
<input type="text" id="name" name="name" required><br><br>

<label for="email">Email:</label>
<input type="email" id="email" name="email" required><br><br>
<label for="age">Age:</label>
<input type="number" id="age" name="age" ____________________><br><br>
<button type="submit" name="submit">Submit</button>

</form>
```

(b) Creating a Hyperlink: Write an HTML snippet to create a hyperlink that opens `https://sports.iiit.ac.in` in a new tab when clicked. **[1 Mark]**

(c) Write a CSS rule to center a div inside a parent container with the class name parent, both horizontally and vertically, using Flexbox. Fill in the missing values. **[1 Mark]**

```
.parent
{
 display: flex;
justify-content: center;
align-items: ___________________;
height: 100vh;
 width: ____________________________;
}
```

Q7: Using JavaScript answer the following questions:

(a) What is the difference between let, const, and var in JavaScript? Provide an example for each. **[2 Marks]**

(b) Write a JavaScript code snippet to change the background color of a `<div>` element to blue when a button is clicked. The `<div>` has the class name `"box"`, and the button should have a class name `"btn"`. Use `querySelector` to select the elements and an event listener to handle the click event. Fill in the blanks. **[2 Marks]**

```
<script>
document.querySelector('.btn').___________('click', function() {
Document.querySelector('box')__________ . _____________ = 'blue';
});
</script>
```