Comprehensive Python Developer Assessment

Duration: 1 hour
Instructions:

1. You can download this assessment document, edit and submit with your answers in the format shown below.
2. Do not use google and any online help to answer.
3. Answers that you provide, will be a baseline for discussion during the interview.
4. Attempting answers to all questions is mandatory.

Name of the Candidate:

Total Experience:

Question 1 (Logic - Programming):

Scenario: Write a Python program for a given logic.

Task: We have 2 variables, variable1 and variable2. Please find the index of the sub-string occurrence. Prepare the custom logic and Avoid using inbuilt functions.

Input: variable1 = "gifts are good to hold",
variable2= "good"
Output: 10
Explanation: "good" occurs at index 10.

Question 2 (MySQL - Query Optimization):

Scenario: Query optimizations.

Task: Optimize the following query with clear explanation:

```
select * from emp
        where department_id in
                (select id from department
```

```
where city in
        (select city from cities) )
```

Question 3 (File Operations) :

Scenario: Perform file read/write operations.

Task: Write a python program, that reads the file employees.csv and return the following output:

Input: employees.csv

EmployeeID	Salary	Department
1SB001	10,00,000	Development
1SB002	20,00,000	Business
1SB003	10,00,000	Development
1SB004	30,00,000	Sales
1SB005	10,00,000	Business
1SB006	50,00,000	Development

Output:

Department	TotalEmployee	HighestSalary
Development	3	50,00,000
Business	2	20,00,000
Sales	1	30,00,000

Question 4 (Recursive function - Python):

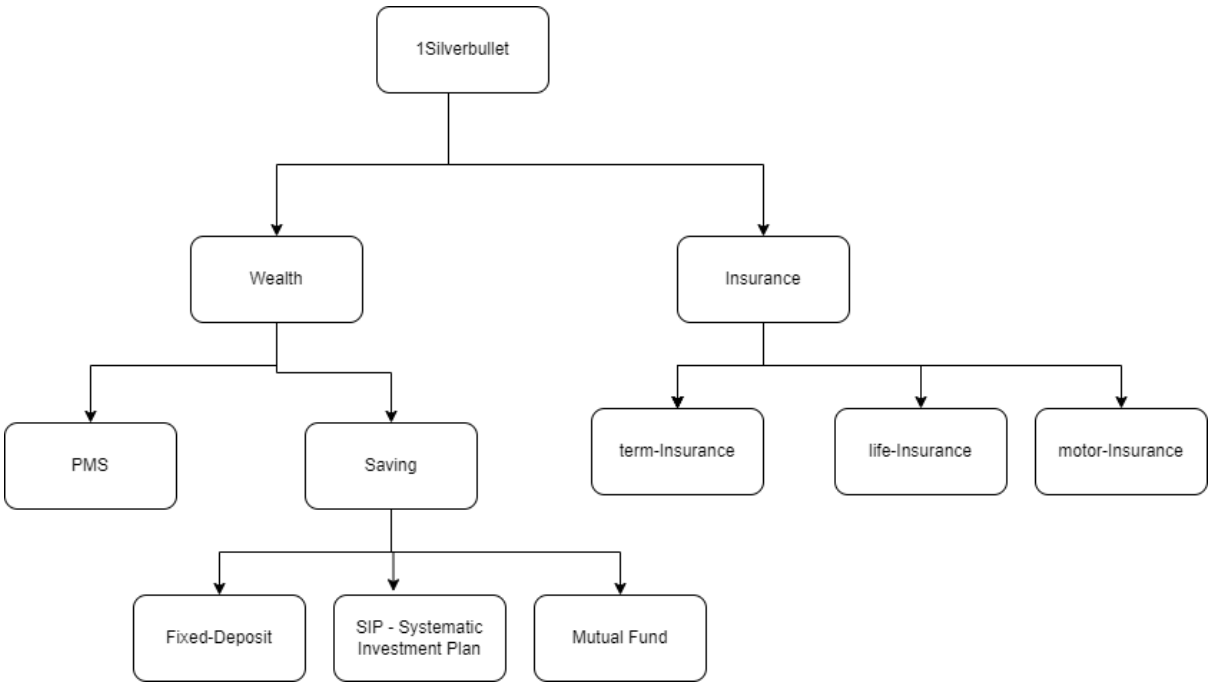
Write a logic to Find the list of prime numbers for the range for 30 using a recursive function.

Question 5 (Python Data Structure):

Write code snippets to hold below given diagram data/Nodes in python data structure.

Note:

- Please make a note we can extend this below tree till Nth level.
- Make sure easy traversing/Searching should be possible with your provided solution.



Question 6: Describe the memory management in python ? How python will handle the memory management in below 5 scenarios.

1. **Var1 = [1, 2, 3]**
2. **Var2 = Var1**
3. **Var1.append(4)**
4. **Var2 = (1, 2)**
5. **Var2[0] = 3**