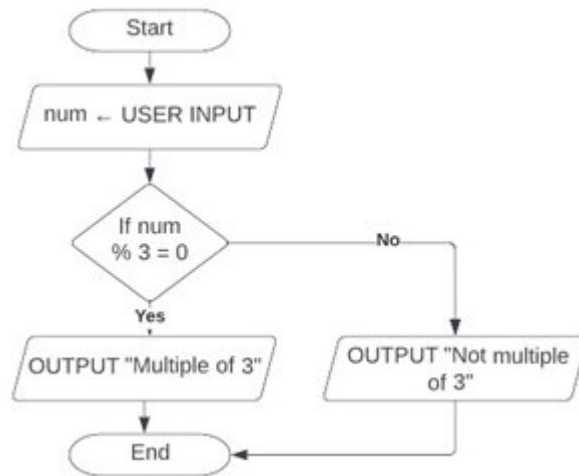


MrGoff.com Algorithms Test (Offline)

Define algorithm. (1 mark)

Explain what decomposition is and how it might apply to making a higher or lower number guessing game. (2 marks)

Explain a way in which the London Tube Map demonstrates abstraction. (2 marks)



Basic flowchart algorithm

What is the purpose of the basic flowchart algorithm above? (2 marks)

What is the processing in the algorithm? (1 mark)

MrGoff.com Algorithms Test (Offline)

```
num ← USER INPUT
FOR i ← 1 to num
  OUTPUT i
END FOR
```

Basic pseudocode algorithm

What would be the output if the user entered 5 when running the basic pseudocode algorithm above? (1 mark)

Explain how a binary search for 'fuchsia' in the array colours=['amber','blue','coral','deeppink','fuchsia','gold','honeydew'] would proceed. (5 marks)

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```
num ← USER INPUT          num ← USER INPUT
found ← False              found ← False
FOR i ← 1 to LEN(array)    i ← 1
  IF num = array[i] THEN  WHILE i < LEN(array) AND found = False
    found ← True          IF num = array[i] THEN
  END IF                  found ← True
END FOR                   END IF
                          i ← i + 1
                          END FOR
```

Comparing algorithms

Both algorithms above have the same purpose. What is it, which algorithm is more efficient and why? (3 marks)

The next couple of questions refer to the array $\text{nums} \leftarrow [21,3,42,7,13,22,18]$

Show the process for making a pass of this data in a bubble sort. (4 marks)

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Show the process for merge sorting nums ← [21,3,42,7,13,22,18] (3 marks)

Explain the advantages and disadvantages of the merge sort compared to the bubble sort (3 marks)
