COMPUTER SCIENCE

ALGORITHM IN PSEUDOCODE

Standard Methods Of Solution

STARTER

KNOWING WHAT YOU KNOW

Go to:

https://joinmyquiz.com

- You are to write your real name and grade.
- Example: Nguyen Do Thy 9G5

LESSON OBJECTIVES

Students should be able to:

- Do Pseudocodes for sample problems
- Understand Pseudocode for standard methods of solution
- Understand pseudocode solution for Totalling, Counting, Max, Minimum

Pseudocode

Write pseudo code that reads in three numbers and Print them all in sorted order.

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main.py > ...

```
1  """Write pseudo code that reads in three numbers and Print them all in
   sorted order."""
2  #This program sorts 3 inputted numbers and output it. Mr Fritz
3
4  a = 3
5  b = 1
6  c = 5
```

```
1 3 5 are the sorted numbers
```

Pseudocode

Write pseudo code that reads in three numbers and Print them all in sorted order.

main.py > ...

```
1  """Write pseudo code that reads in three numbers and Print them all in
   sorted order."""
2  #This program sorts 3 inputted numbers and output it. Mr Fritz
3
4  a = 6
5  b = 1
6  c = 5
```

```
1 5 6 are the sorted numbers
>
```

Pseudocode

Write pseudo code that reads in three numbers and Print them all in sorted order.

main.py › ...

```
1  """Write pseudo code that reads in three numbers and Print them all in
   sorted order."""
2  #This program sorts 3 inputted numbers and output it. Mr Fritz
3
4  a = 6
5  b = 1
6  c = 2
```

```
1 2 6 are the sorted numbers
```

Pseudocode

Write pseudo code that reads in three numbers and Print them all in sorted order.

```
INPUT Num1, Num2, Num3
IF Num1 < Num 2
    IF Num2 < Num3
        Print Num1, Num2, Num3
        ELSE
         IF Num3 < Num1
              Print Num3, Num2, Num1
              ELSE
              Print Num1, Num3, Num2
ELSE
```

```
    IF Num1 < Num 3
        Print Num2, Num1, Num3
        ELSE
         IF Num3 < Num2
              Print Num3, Num2, Num1
              ELSE
              Print Num2, Num3, Num1
          ENDIF
      ENDIF
          ENDIF
      ENDIF
ENDIF
```

Python Codes

Write pseudo code that reads in three numbers and Print them all in sorted order.

main.py

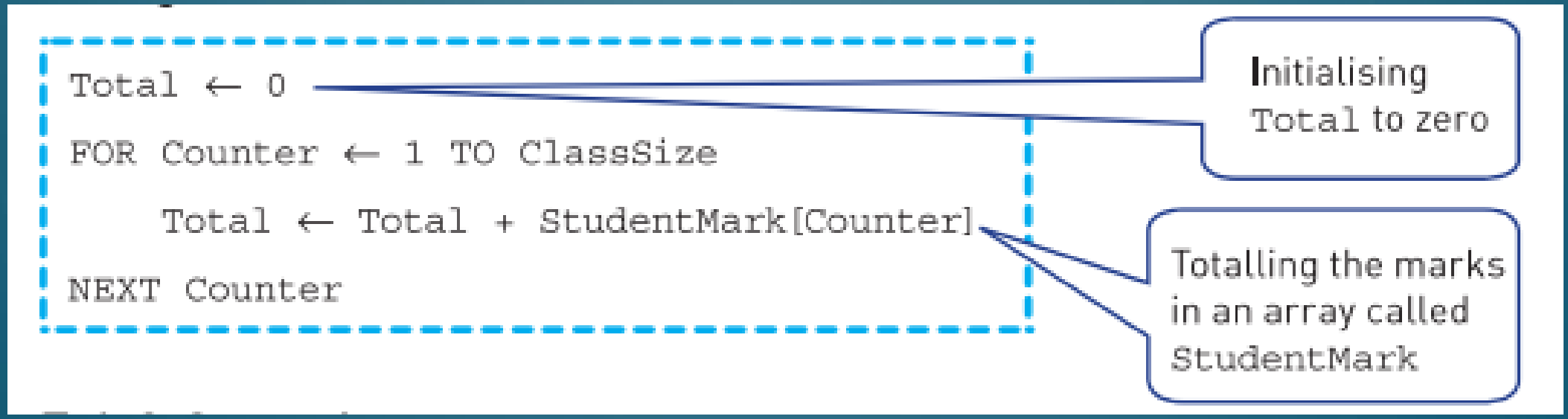
```
#This program sorts 3 inputted numbers and output it. Mr Fritz

a = 3
b = 1
c = 5
if a < b:
  if b < c:
    print (a, b, c, "are the sorted numbers")
  else :
    if c < a:
      print (c, b, a, "are the sorted numbers")
    else :
     print (a, c, b, "are the sorted numbers")
else:
  if a < c:
    print (b, a, c, "are the sorted numbers")
  else:
    if c < b:
      print (c, b, a, "are the sorted numbers")
    else:
      print (b, c, a, "are the sorted numbers")

```

Standard Methods used in Algorithm

- Totalling
- Counting
- Finding Maximum, Minimum, and Average
- Searching using a Linear search
- Sorting using Bubble Sort

TOTALLING

- Means, keeping total that values are added to.



COUNTING

- Keeping a count of the number of times an action is performed

```
PassCount ← 0
FOR Counter ← 1 TO ClassSize
    INPUT StudentMark
    IF StudentMark > 50
        THEN
            PassCount ← PassCount + 1
NEXT Counter
Count ← Count + 1
```

Initialising PassCount to zero

Counting the number of passes

COUNTING

- Keeping a count of the number of times an action is performed

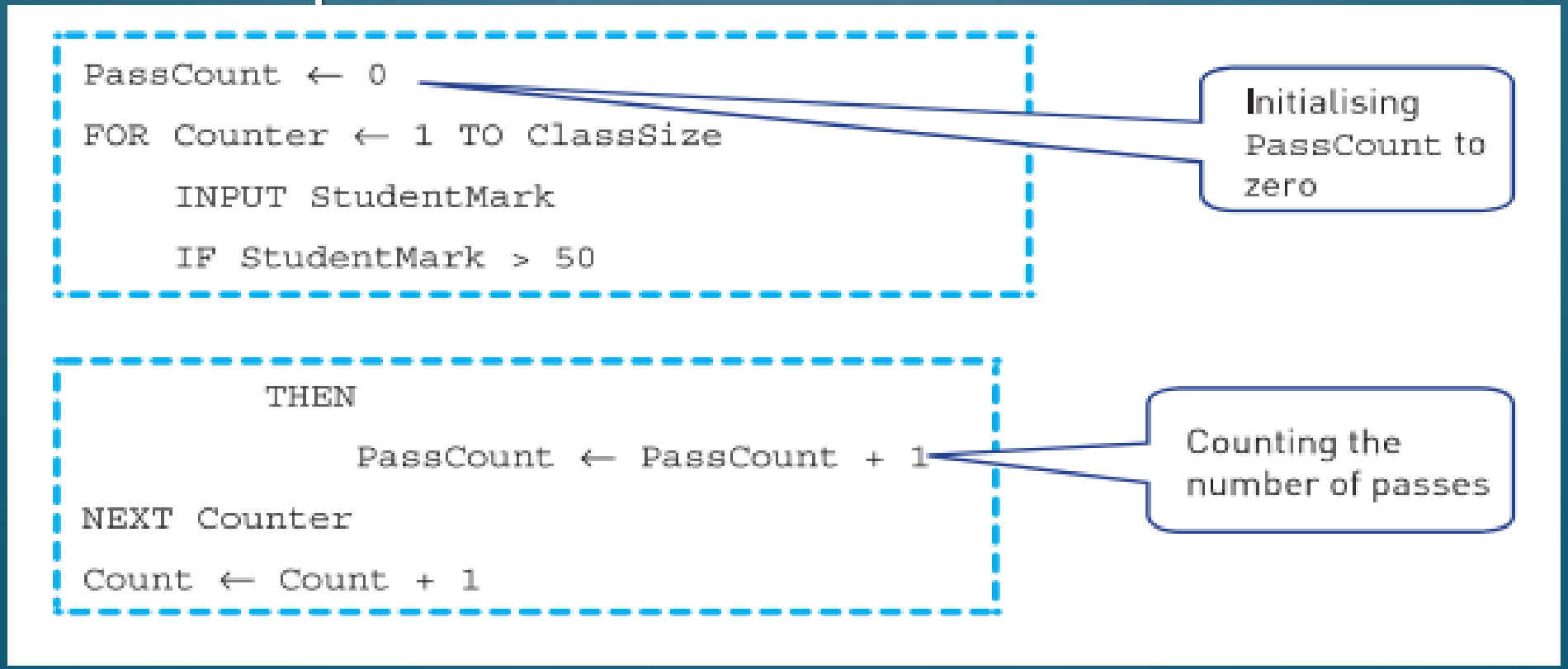
```
PassCount ← 0
FOR Counter ← 1 TO ClassSize
    INPUT StudentMark
    IF StudentMark > 50
        THEN
            PassCount ← PassCount + 1
NEXT Counter
Count ← Count + 1
```

Initialising PassCount to zero

Counting the number of passes

COUNTING (Adding)

- Keeping a count of the number of times an action is performed



COUNTING (Subtracting)

- Counting is also used to countdown until a certain value is reached. Example code snippet:

```
:
NumberInStock ← NumberInStock - 1
IF NumberInStock < 20
     THEN
          CALL Reorder()
:
```

Counting down items in stock

Maximum, Minimum, and Average

- Finding the largest and smallest value in the list a two standard methods that are frequently used in an algorithm.
- Example: Finding the highest and lowest mark awarded to a class of students.

mark awarded to a class of students.

```
MaximumMark ← 0
MinimumMark ← 100
FOR Counter ← 1 TO ClassSize
  IF StudentMark[Counter] > MaximumMark
    THEN
      MaximumMark ← StudentMark[Counter]
  ENDIF
  IF StudentMark[Counter] < MinimumMark
    THEN
      MinimumMark ← StudentMark[Counter]
  ENDIF
NEXT Counter
```

Initialising maximum to the lowest mark possible

Calls data from an array called StudentMark)

Initialising minimum to the highest possible

Replacing the maximum mark with a higher mark

Replacing the minimum mark with a lower mark

Maximum, Minimum, and Average


```
MaximumMark ← StudentMark[1]
MinimumMark ← StudentMark[1]
FOR Counter ← 2 TO ClassSize
  IF StudentMark[Counter] > MaximumMark
    THEN
      MaximumMark ← StudentMark[Counter]
  ENDIF
  IF StudentMark[Counter] < MinimumMark
    THEN
      MinimumMark ← StudentMark[Counter]
  ENDIF
NEXT Counter
```

Initialising minimum and maximum to the first mark

Starting the loop at the second position in the list.

- Example: Finding the highest and lowest mark awarded to a class of students. If the largest and smallest values are not known, set the maximum and minimum values to the first item on the list.

Maximum, Minimum, and Average

- Calculating the average (mean) of all the values is an extension of the totalling method.
- Example: Calculating the average mark of a class of students.

```
Total ← 0
FOR Counter ← 1 TO ClassSize
  Total ← Total + StudentMark[Counter]
NEXT Counter
Average ← Total / ClassSize
```

Calculating the average from the total after the loop has been completed

PLENARY

KNOWING WHAT YOU LEARNED

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COMPUTER SCIENCE

Let me know about your learning by doing the reflection and support survey on my website

https://www.febstar.com

THANK YOU

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