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 Anh Thanh 10SL2

LESSON OBJECTIVES

Students should be able to:

- Do Pseudocodes for sample problems
- Understand Pseudocode for standard methods of solution

Pseudocode

Write the Pseudocode that gets the average of 3 numbers using FOR loop.

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Write the Pseudocode that gets the average of 3 numbers using FOR loop.

```
FOR counter = 1 to 3
        PRINT “Enter a number”
        INPUT (Mark)
        Total = Total + Mark
NEXT
Average = Total /3
PRINT “The average is: “
PRINT (Average)
```

Python Codes

Write the Pseudo that gets the average of 3 numbers using FOR loop.

main.py › ...

```
1  #Getting the AVERAGE using FOR loop
2  addnum = 0
3  total=0
4  mark=0
5  for count in range(3):
6      print("Please input a number")
7      addnum = input(int(mark))
8      total = int(total) + int(addnum)
9  avg = total/3
10 print("The average is:", avg)
11 print("Finally finished!")
```

```
Please input a number
067
Please input a number
068
Please input a number
090
The average is: 75.0
Finally finished!
```

Pseudocode

Write the Pseudocode to get and calculate the factorial of a given number using WHILE loop

Pseudocode

Write the Pseudo to get and calculate the factorial of a given number using WHILE loop

Pseudocode:

```
Input num
count←1
fact←1
    While (count<num) Do
        count=count+1
        fact=fact×count
    endwhile
Print fact
```

Python Codes

Write the Pseudo to get and calculate the factorial of a given number using WHILE loop

main.py > ...

```
1  fact=1
2  count=1
3  num= input('enter a number')
4  while count < int(num):
5      count= count+1
6      fact = count*fact
7  print ("The factorial of the number is: ", fact)
```

```
enter a number4
The factorial of the number is:  24
```

Pseudocode

Write the Pseudo that gets the average of 3 numbers using FOR loop.

```
For counter = 1 to 3
        Print “Enter a number”
        Input (Mark)
        Total = Total + Mark
Next
Average = Total /3
Print “The average is: “
Print (Average)
```

Pseudocode

Write Pseudocode to print all multiples of 5 between (1 and 200).

```
Print all multiples 5 between 1 to 200
1
5
25
125
>
```

Pseudocode

Write Pseudocode to print numbers in multiples of 5 between 1 and 200.

```
Print all multiples 5 between 1 to 200
1
5
25
125
>
```

Pseudocode

Write a Pseudocode to print all multiples of 5 between (1 and 200).

```
X ← 1
While (x<200)
   Print x
   x = x*5
 Endwhile
```

Python Codes

Write a Pseudocode to print all multiples of 5 between (1 and 200).

main.py

main.py > ...

```
1  # Printing all multiple of 5s between 1 to 200
2  print ("Print all multiples 5 between 1 to 200 ")
3  x = 1
4  while (x < 200):
5      print (x)
6      x = x * 5
7
```

Pseudocode

Write pseudo code that performs the following:

Ask a user to enter a number. If the number is between 0 and 10, write the word blue.

If the number is between 11 and 20, write the word red.

if the number is between 21 and 30, write the word green.

If it is any other number, write that it is not a correct color option.

Pseudocode


```
INPUT Num 1
IF Num1 >=0  AND Num1 <=10
        PRINT " Your color is BLUE"
        ELSEIF Num1 >=11  AND Num1 <=20
        PRINT " Your color is RED"
        ELSEIF Num1>=21  AND Num1 <=30
        PRINT " Your color is GREEN"
        ELSE
        PRINT " You color is not in the selection of number"
ENDIF
```

Python Codes

main.py > ...

```
1  # Program that identifies input base on the condition
2  # 0 to 10 is Blue
3  # 11 to 20 is Red
4  # 21 to 30 is Green
5  # 31 and above is not in the selection
6  num = input("enter a number   ")
7
8  if (int(num)>=0 and int(num)<=10):
9    print ("Your color is blue")
10 else:
11   if(int(num)>10 and int(num)<=20):
12     print ("Your color is red")
13   else:
14     if (int(num)>20 and int(num) <= 30):
15       print("your color is Green")
16     else:
17       print ("your color is not in the selection of numbers")
```

```
enter a number   30
your color is Green
```

Pseudocode

Write pseudo code that performs the following:

Ask a user to enter a number. If the number is between 0 and 10, write the word blue.

If the number is between 10 and 20, write the word red.

if the number is between 20 and 30, write the word green.

If it is any other number, write that it is not a correct color option.

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

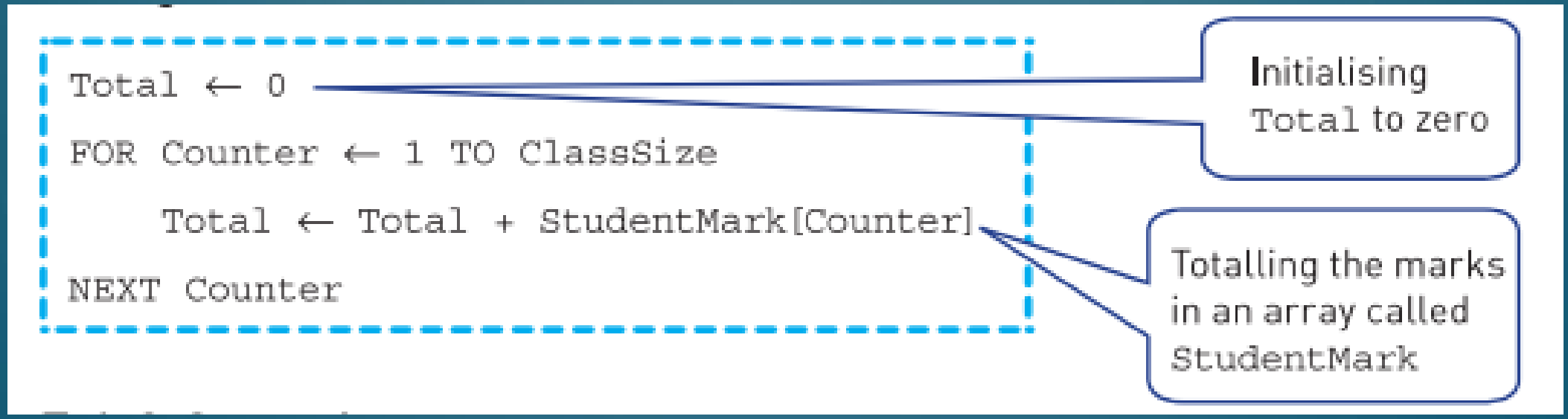
```
#This program sorts 3 inputted numbers and output it. Mr Fritz

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

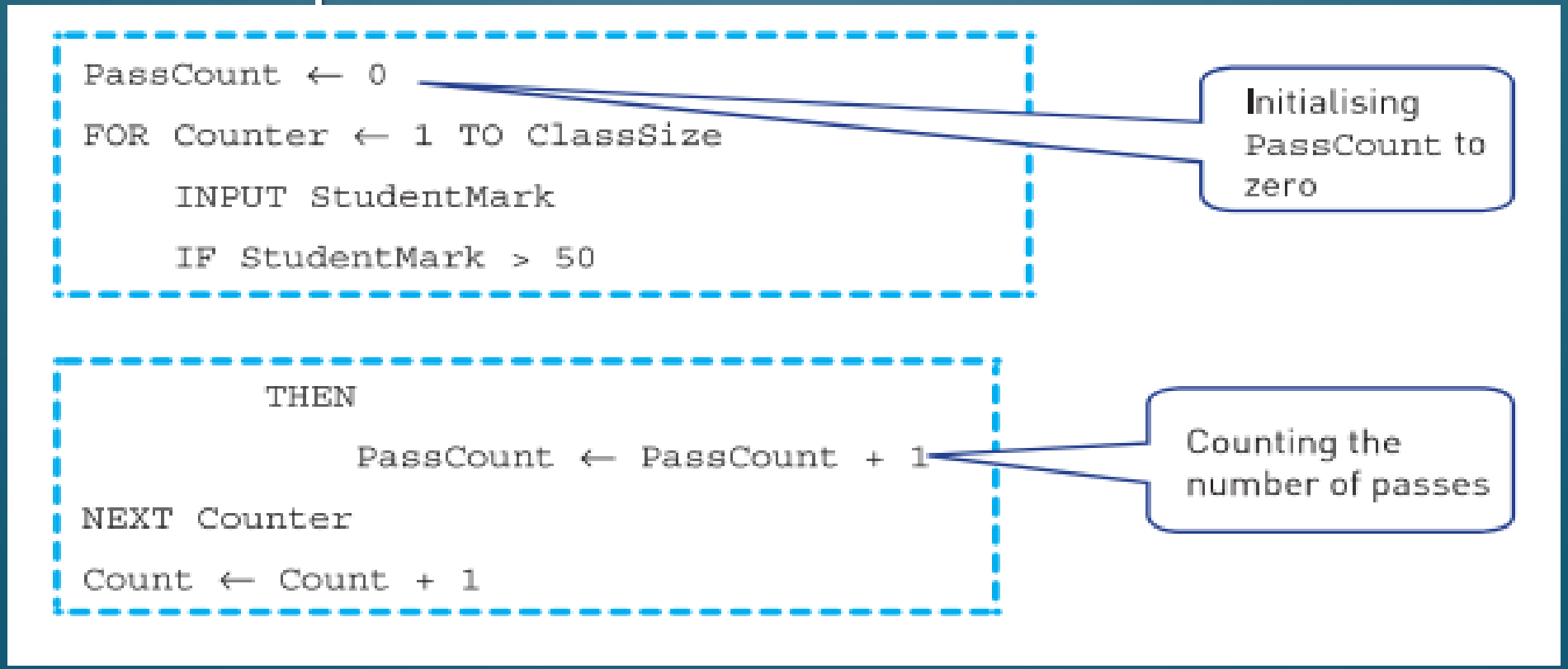
TOTALLING

- Means, keeping total that values are added to.



COUNTING

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



COUNTING

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

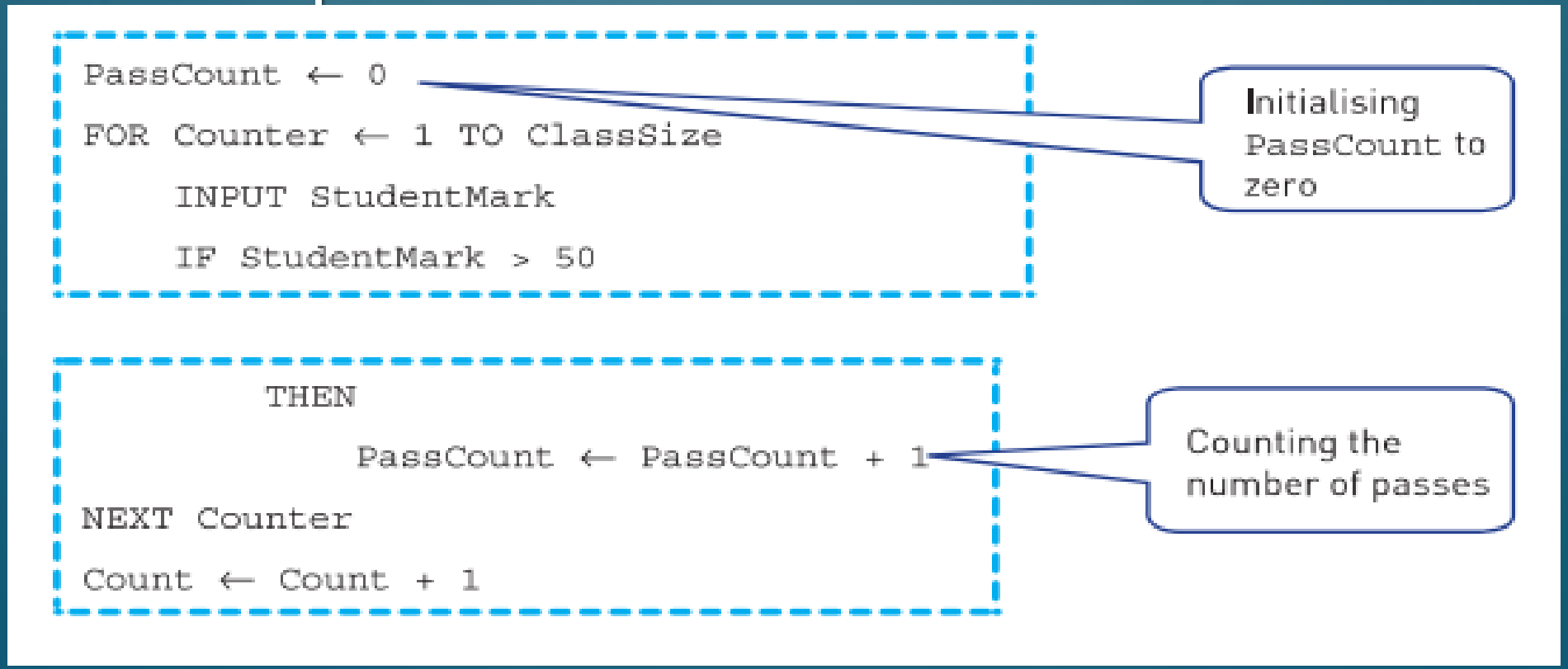
```
PassCount ← 0
FOR Counter ← 1 TO ClassSize
    INPUT StudentMark
    IF StudentMark > 50
        THEN
            PassCount ← PassCount + 1
NEXT Counter
Count ← Count + 1
```

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

Go to:

https://joinmyquiz.com

- You are to write your real name and grade.
- Example: Nguyen Anh Thanh 10SL2

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THANK YOU

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