**Discussion 1**

The following Pseudocode read in 10 students’ scores and calculate the average.

Initialize student\_counter to zero

While student\_counter is less than or equal to ten

Input the next score

Add the score into the total

EndWhile

Set the class average to the total divided by ten

There are some errors in the above Pseudocode. Please indicate where the errors are and how to correct them.

1. Initialise total to zero

“total” variable must be initalised

1. While student\_counter is less than or equal to ten

If we write it like this, it will count from student 0 to student 10, which means there are 11 students. The correct form will be “less than ten”.

1. Input the next score

This should mean requesting user input for the score.

1. Student counter must be added by 1 every time a student score is entered.

Input the next score

Add the score into the total

Add student\_counter by one

**Discussion 2**

Fill in the blanks to complete the following Pseudocode to read in 10 students’ scores and calculate the number of passes and failures.

Initialize passes to zero

Initialize failures to zero

Initialize student\_counter to one

While student\_counter is less than or equal to ten

Input the next score

If the score entered is below pass mark

Add failures by one

else

Add passes by one

Add one to student\_counter

EndWhile

Print failures

Print passes

**Discussion 3**

Write the FizzBuzz algorithm using pseudocode.

FizzBuzz is a standard interview problem. The Problem state:

* Write a code that prints each number from 1 to 20 on a new line.
* Print “Fizz” if the number is the multiple of 3.
* Print “Buzz” if the number is multiple of 5
* For number which is multiple of both 3 and 5 print “FizzBuzz”

The ***sample run*** is as follows:

1

2

Fizz

4

Buzz

Fizz

7

8

Fizz

Buzz

11

Fizz

13

14

FizzBuzz

16

17

Fizz

19

Buzz

Initialize current\_number to 1

While current\_number is less than or equal to 20:

If current\_number % 3 is equal to 0 and current\_number % 5 is not equal to 0:

print “Fizz”

Else if current\_number % 3 is not equal to 0 and current\_number % 5 is equal to 0:

print “Buzz”

Else if current\_number % 3 is equal to 0 and current\_number % 5 is equal to 0:

print “FizzBuzz”

Else:

print current\_number

Add current\_number by 1

**Discussion 4**

For each of the following, discuss what the outcome will be if they are executed by a Python interpreter (e.g.IDLE3) in the sequence shown.

**c = 10**

**7 = a**

**a = d**

**a = c + 1**

**a + c = c**

**3 + a**

**7up = 10**

**import = 1003**

**b = math.pi \* c**

**int = 500**

**a \*\* 3**

**a,b,c = c,1,a**

**b,c,a = a,b**

**c = b = a = 7**

**print( A )**

**print( "b\*b + a\*a = c\*c" )**

**print( ‘A’ )**

**print( "c" = 1 )**

c = 10

Error, 7 cannot start

Error, d is not defined

a = 11

Error, left side cannot be expression

14

Error, 7 cannot start

Error, import must be followed by module

Error, import math first, but math.pi() is a function, not a number or variable

int = 500 (valid but dangerous)

11^3

a = c, b = 1, c = a

Error, not able

c = b = a = 7

Error, A is not defined (diff from a)

b\*b + a\*a = c\*c

A

Error, cannot assign “c” to 1 in one statement

**Discussion 5**

Write a program that asks the user for the number of boys and that of girls in a class. The program should calculate and display the percentage of boys and girls in the class. A sample run is as follows:

**Enter the number of boys: 65**

**Enter the number of girls: 77**

**Boys: 46%**

**Girls: 54%**

1. Design the algorithm and use flowchart to present.
2. Write the Python program. *(optional)*

req1 = input("Enter the number of boys: ")

req2 = input("Enter the number of girls: ")

def ohno():

print("Enter a valid number of boys and girls. Must be a number.")

if req1.isnumeric() and req2.isnumeric():

num\_boys = int(req1)

num\_girls = int(req2)

total = num\_boys + num\_girls

print("Boys: " + str(round(num\_boys/total\*100)) + "%")

print("Girls: " + str(round(num\_girls/total\*100)) + "%")

else:

ohno()

**Discussion 6**

A travel agency is planning a tour for tourists to visit multiple attractions in a city. The agency wants to create an itinerary that visits all attractions listed in the following table while minimizing travel time. Each attraction is located at a different point in the city, and the distances between the attractions are known. The tour must start and end at the hotel where the tourists are staying. The goal is to find the most efficient route that visits each attraction exactly once and returns to the starting point, ensuring that tourists have the best possible experience with the least amount of time spent traveling.

A screenshot of a computer

Description automatically generated

Propose a solution to above problem.

Logical solution:

1. Sort the places by distances from hotel to attractions.
2. Find the shortest distance. In case two places share the same distance, proceed to step 3. If not, proceed to step 4.
3. Find the shortest distance between the two chosen places with other places. Which one has the shortest distance to move to other places? Choose one between the first two chosen.
4. After choosing the first one, sort by distance from that place to 4 other attractions. In case two places share the same distance, redo step 3. Choose one that’s the closest.
5. Do step 4 repeatedly for second, third, and fourth choice.
6. Return to hotel.

Step by step:

1. Look for the closest distance to hotel.

**Two places share the shortest distance: City Park and Museum of Art.**

1. Look for lowest distance from City Park to other destinations. Do the same with Museum of Art to other destinations. Choose one.

**The closest is between City Park and Science Center at 2 km, compared to Museum of Art and Historical Castle at 3 km.**

1. Go to City Park. Look for the closest distance from City Park.

**The closest is Science Center at 2 km.**

1. Go to Science Center. Look for the closest distance from Science Center, that has not been visited.

**The closest title is shared between Museum of Art and Botanical Garden.**

1. Look for the lowest distance from either Museum of Art and Botanical Garden to other destinations. Choose one.

**The closest is between Botanical Garden and Historical Castle at 1 km.**

1. Go to Botanical Garden. Look for the closest distance from Botanical Garden, that has not been visited.

**The closest is Historical Castle at 1 km.**

1. Go to Historical Castle. Look for the closest distance from Historical Castle, that has not been visited.

**The closest place that has not been visited is Museum of Art at 3 km.**

1. Go to Museum of Art. Look for the closest distance from Museum of Art, that has not been visited.

**No more place to go.**

1. Return to hotel. **The distance is 1 km.**