Name: Class:

Task 1

(a) Write an algorithm which performs the following tasks:

Asks the user to enter their age, it then calls a function called rangeCheck. This function accepts the age, lower limit and upper limit as parameters, validates the entry, which should be between 16 and 19, and returns either True or False depending on whether age is valid or not.

Finally, “Age valid” or “Age invalid” is output depending on whether or not the age is valid

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(b) Another programmer wants to use the rangeCheck subroutine to ensure that a clerk has entered a quantity (quantity) of similar items between 1 and 100, and a price (price) for each item between 10.00 and 150.00.

Write the **two** statements that wil be needed to validate the quantity and the price.

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(c) Amend the algorithm in (a) so that it keeps asking for an age until an age within the range is entered.

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Task 2

Part of a password verification routine is given below.

A user is asked to enter a new password twice. The password they enter is checked to see that it has between 8 and 15 characters. The two passwords are then verified to see that they are the same.

If the passwords are not the same or aren’t the correct length, the user is asked to enter them again. If the passwords are valid and verified then the output “Password accepted” is given.

validPassword = False

while **CONDITION 1**

password1 = input("Enter password: ")  
 password2 = input("Enter password again to verify: ")  
 if **CONDITION 2**

print("Password must be between 8 and 15 characters")

elseif **CONDITION 3**   
 print("Passwords don’t match")

else

**TWO LINES OF CODE HERE**

endif

endwhile

(a) Complete the three conditions: **CONDITION 1**, **CONDITION 2** and **CONDITION 3**

(b) Complete the two lines of code that will occur if the passwords are accepted.

(c) Write the program in a language you are familiar with.

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Task 3

The following program has been written which takes an array of numbers and then prints the average of them.

array a[5]

a = [5,3,2,8,8]

c = 0

for i = 0 to 5

c = c + a[i]

endfor

d = c / 5

print(d)

(a) The program would be improved by the use of more appropriate variable names. Rewrite the code to make this improvement.

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(b) The program currently uses the value 5 in calculations and the loop. It would be more maintainable if this wasn’t hard coded in the program. Replace 5 with a piece of code, such as a variable, to make it more maintainable.

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(c) The code written is not reusable. It would be improved and more maintainable if it used a function. Adapt the program to make use of a reusable function.

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(d) The program would be more maintainable by making use of comments. Write suitable comments to the program.

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