**Task 1**

1. What will be the output from the algorithm below if the user inputs “Hi, Jo!”

Explain briefly the purpose of the algorithm.

function encrypt(message, shift)

message = lowercase(message)

encryptedMessage = ""

for x in message

if x in “abcdefghijklmnopqrstuvwxyz”

num = ord(x) # convert to ASCII value

num = num + shift

if num > ord(“z”) # wrap if necessary

num = num – 26

endif

char = chr(num) # convert back to character

encryptedMessage = encryptedMessage + char

else

encryptedMessage = encryptedMessage + x

endif

next x

return encryptedMessage

endfunction

# main program

shift = 3

msg = input(“Enter your message: ”)

encryptedMessage = encrypt(msg, shift)

print(“The encrypyted message is: ”, encryptedMessage)

**Task 2**

2. An array marks is defined as follows: marks[15, 18, 14, 9, 16, 12, 10]

A pseudocode algorithm for an algorithm is given below.

items = len(marks)

for i = 0 to items - 2

for j = 0 to (items - i - 2)

if marks[j] > marks[j+1]

temp = marks[j]

marks[j] = marks[j+1]

marks[j+1] = temp

endif

next j

next i

print (marks)

One pass is made through the outer loop of the algorithm.

Complete the trace table below to show how the contents of the array changes.

| **items** | **i** | **j** | **temp** | **marks** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **[0]** | **[1]** | **[2]** | **[3]** | **[4]** | **[5]** | **[6]** |
|  |  |  |  | 15 | 18 | 14 | 9 | 16 | 12 | 10 |
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What is the name of the algorithm?

3. Complete the trace table to determine the purpose of the following algorithm.   
Test it with input 11 and 5.

x = input ("Enter the first integer: ")

y = input ("Enter the second integer: ")

z = 0

while x > 0

if x mod 2 == 1 then

z = z + y

endif

x = x div 2

y = y \* 2

endwhile

print ("Answer =", z)

| **x** | **y** | **z** | **x> 0** | **x mod 2 == 1** | **output** |
| --- | --- | --- | --- | --- | --- |
| 11 | 5 | 0 | True | True |  |
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