**Question One**

Given a list of integers, write Python code to create a **new list** with same number of elements

as the original list such that each integer in the new list is the sum of its neighbors and itself in

the original list.

For example, if list A = [10,20,30,40,50], then list B = [30,60,90,120,90].

def getAdjacentSum(arr):

#Declare array of size equal to the len of array

size = len(arr)

sumArr = [0] \* size

#Sum of first and next of first element

sumArr[0] = (arr[0] + arr[1])

#iterating till size - 1

for i in range(1,size-1):

#sum of neighbours in the array

sumArr[i] = arr[i-1] + arr[i] + arr[i+1]

#sum of last and last but one element

sumArr[-1] = arr[-2] + arr[-1]

return sumArr

#call function and printing value

print(getAdjacentSum([10,20,30,40,50]))

Text

Description automatically generated

**Question Two**

Write a program that calculates the amount of money a person would earn over a period

of time if his or her salary is one penny the first day, two pennies the second day, and

continues to double each day. The program should ask the user for the number of days.

Display a table showing what the salary was for each day, and then show the total pay at

the end of the period. The output should be displayed in a dollar amount, not the number

of pennies.

#take number of days from user

num\_days=int(input("Enter number of days: "))

#set day\_pay for first day is 1 penny = 0.01

day\_pay=0.01

#set total\_pay to 0

total\_pay=0

#print day and salary

print("Day | Salary for each day")

print("--------------------------")

print("%3d $%0.2f"%(1,day\_pay))

#add day\_pay into total\_pay

total\_pay=total\_pay+day\_pay

#calculate salary for number of days and print day and salary for that day

for day in range(1,num\_days):

day\_pay=day\_pay\*2

print((day+1)," ",round(day\_pay + .01,2))

#add day\_pay into total\_pay

total\_pay=total\_pay+day\_pay

#print total\_pay

print("Total pay: $%.2f"%total\_pay)

Text

Description automatically generated

**Question Three**

**Encryption:**

Write a program in Python or C++ that has TWO functions:

Function One is called: \_encrypt

Function Two is called: \_decrypt

Function one takes plain text, and assesses the indexed value of each letter in the string. For example, a=1, b=2. It then adds three to the indexed value, and produces encrypted text, based off of the plain text.

Function two reverses this.

Here is sample output:

\_encrypt('how do you do')

Unsecured: howdoyoudo

Secured: lsahscsyhs

\_decrypt('lsahscsyhs')

Unsecured: lsahscsyhs

Secured: howdoyoudo

**Question Four**

*Sum of consecutive integers*

a) Write a program that prompts for an integer—let’s call it X—and then finds the

sum of X consecutive integers starting at 1. That is, if X=5, you will find the sum of

1+2+3+4+5=15.

x = int(input("Enter an integer: "))

sum = 0

for i in range(1,x+1,1):

sum = sum + i

print(sum)

Text

Description automatically generated

b) Modify your program by enclosing your loop in another loop so that you can find

consecutive sums. For example , if 5 is entered, you will find five sum of consecutive

numbers:

1 = 1

1+2 = 3

1+2+3 =6

1+2+3+4 =10

1+2+3+4+5 =15

Print only each sum, not the arithmetic expression.

x = int(input("Enter an integer: "))

for j in range(1,x+1,1):

sum = 0

for i in range(1,j+1,1):

sum = sum + i

print(sum)

Text

Description automatically generated

**Question Five**

Decision Structures and Boolean Logic

1. Write an *if* statement that assigns 20 to the variable y and assigns 40 to the variable z if

the variable x is greater than 100.

x=int(input("What is x worth?: "))

b= 100

if x > 100:

y=20

z=40

print(y,z)

2. Write an *if* statement that assigns 0 to the variable b and assigns 1 to the variable c if the

variable a is less than 10.

a=int(input("What is a worth?: "))

if a < 10:

b=0

c=1

print(c,b)

3. Write an *if-else* statement that assigns 0 to the variable b if the variable a is less than 10.

Otherwise, it should assign 99 to the variable b.

a=int(input("What is a worth?: "))

if a < 10:

b=0

else:

b=99

print(b)

**Question Six**

Write a function that takes as input an English sentence (a string) and prints the total number

of vowels and the total number of consonants in the sentence. The function returns nothing.

Note that the sentence could have special characters like dots, dashes, and so on.

#defining function to count number of vowels and consonents

def count(sentence):

#initializing a list which contains vowels

vowels=['a','e','i','o','u']

#initializing vowels and consonents count as 0

v\_count=0

c\_count=0

#converting the sentence to lower case

sentence=sentence.lower()

#looping each character in sentence

for i in sentence:

#checking if the character is a vowels

if(i in vowels):

#incrementing count of vowels

v\_count+=1

#checking if the character is not a vowel and is a alphabet

elif(i not in vowels and i.isalpha()):

#incrementing count of consonents

c\_count+=1

#printing Number of vowels

print("Number of vowels:",v\_count)

#printing Number of consonents

print("Number of consonents:",c\_count)

#calling count function and testing for a sample sentence

count("hello my name is Dewey.")

Text

Description automatically generated

**Question Seven**

The Fibonacci sequence is: 1, 1, 2, 3, 5, 8, 13 … You can see that the first and second numbers

are both 1. Thereafter, each number is the sum of the previous two numbers.

(a) Write a function to print the first N numbers of Fibonacci sequence.

(b) Write a function to print the Nth number of the sequence.