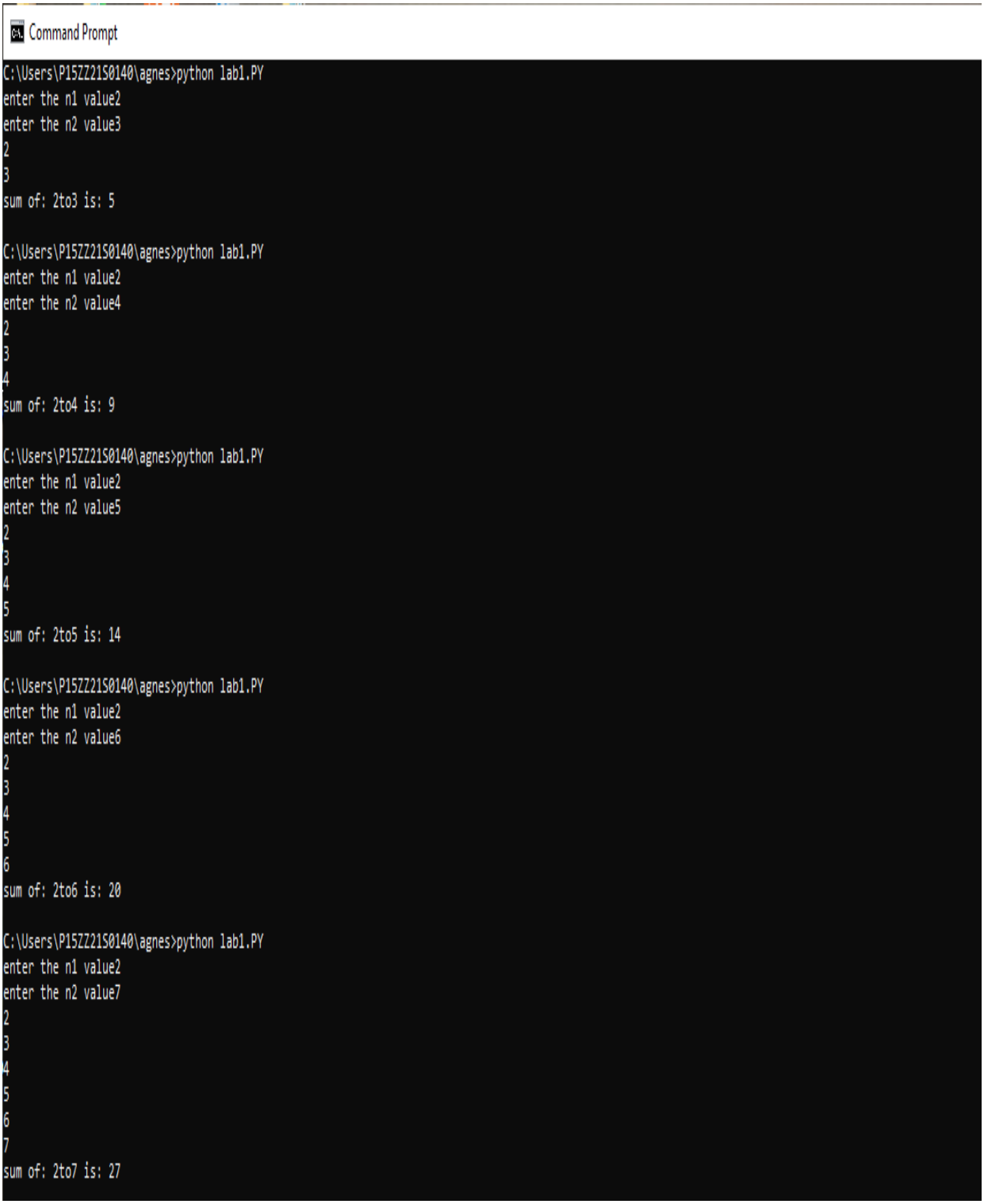
**Program 01: Write a program to sum all the elements from n1 to n2 where n1 and n2 are positive integers.**

```
n1=int(input("Enter the value of n1:"))
n2=int(input("Enter the value of n2:"))

def calc(n1,n2):
    for i in range(n1,n2+1):
        s=sum(range(n1,n2+
        1))
        print(i)
    print(" Sum of " '{0} to {1}'.format(n1,n2),"is",s)

calc(n1,n2)
```

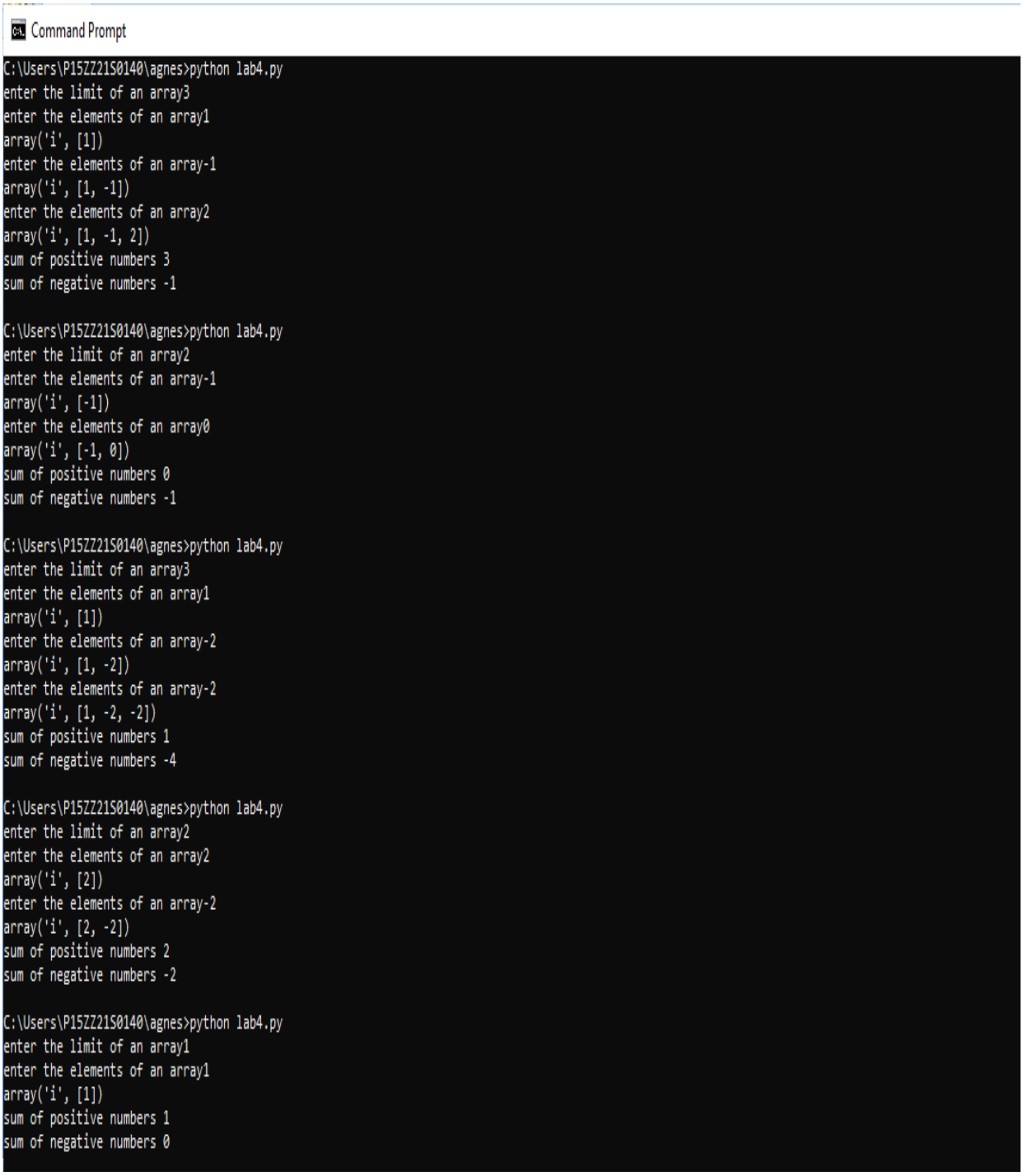
**OUTPUT :**


Command Prompt
C:\Users\P15ZZ21S0140\agnes>python lab1.PY
enter the n1 value2
enter the n2 value3
2
3
sum of: 2to3 is: 5
C:\Users\P15ZZ21S0140\agnes>python lab1.PY
enter the n1 value2
enter the n2 value4
2
3
4
sum of: 2to4 is: 9
C:\Users\P15ZZ21S0140\agnes>python lab1.PY
enter the n1 value2
enter the n2 value5
2
3
4
5
sum of: 2to5 is: 14
C:\Users\P15ZZ21S0140\agnes>python lab1.PY
enter the n1 value2
enter the n2 value6
2
3
4
5
6
sum of: 2to6 is: 20
C:\Users\P15ZZ21S0140\agnes>python lab1.PY
enter the n1 value2
enter the n2 value7
2
3
4
5
6
7
sum of: 2to7 is: 27

**Program 2: Input an array of n numbers and find separately the sum of positive numbers and negative numbers.**

```
from array import *
arr=array('i',[])
n=int(input("Enter a array size:"))
for i in range(n):
    temp=int(input("Enter a array elements:"))
    arr.append(temp)
print(arr)

def sum(arr,n):
    positive=0
    negative=0

    for j in arr:
        if j>0:
            positive+=j
        else:
            negative+=j
    print("Sum of positive numbers:",positive)
    print("Sum of negative numbers:",negative)


sum(arr,n)
```

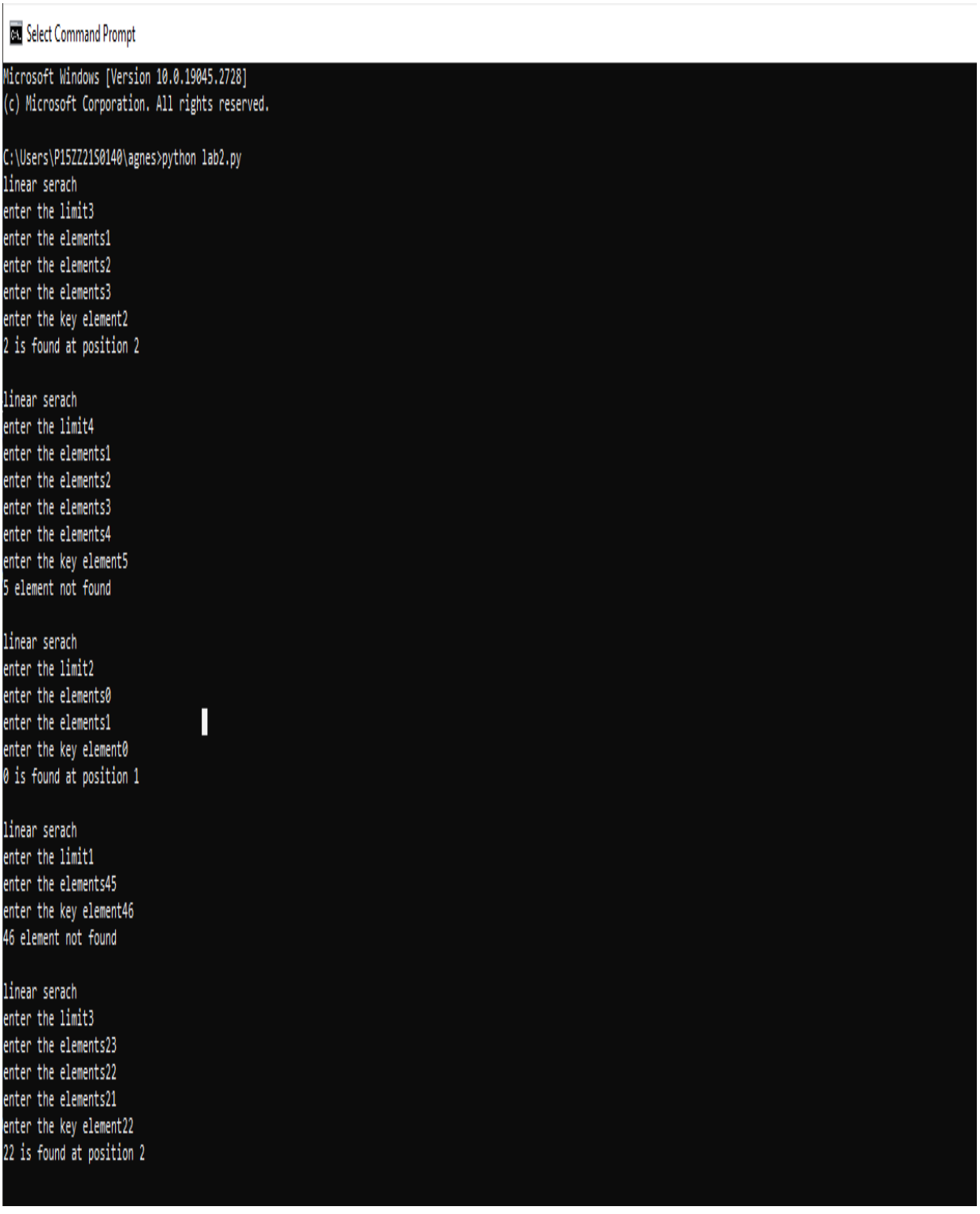
**OUTPUT :**


Command Prompt
C:\Users\P15ZZ21S0140\agnes>python lab4.py
enter the limit of an array3
enter the elements of an array1
array('i', [1])
enter the elements of an array-1
array('i', [1, -1])
enter the elements of an array2
array('i', [1, -1, 2])
sum of positive numbers 3
sum of negative numbers -1
C:\Users\P15ZZ21S0140\agnes>python lab4.py
enter the limit of an array2
enter the elements of an array-1
array('i', [-1])
enter the elements of an array0
array('i', [-1, 0])
sum of positive numbers 0
sum of negative numbers -1
C:\Users\P15ZZ21S0140\agnes>python lab4.py
enter the limit of an array3
enter the elements of an array1
array('i', [1])
enter the elements of an array-2
array('i', [1, -2])
enter the elements of an array-2
array('i', [1, -2, -2])
sum of positive numbers 1
sum of negative numbers -4
C:\Users\P15ZZ21S0140\agnes>python lab4.py
enter the limit of an array2
enter the elements of an array2
array('i', [2])
enter the elements of an array-2
array('i', [2, -2])
sum of positive numbers 2
sum of negative numbers -2
C:\Users\P15ZZ21S0140\agnes>python lab4.py
enter the limit of an array1
enter the elements of an array1
array('i', [1])
sum of positive numbers 1
sum of negative numbers 0

## Program 3: Write a program to search an element using linear search.

```
k=1
n=5
for k in range(n):
    print ("Linear search")
    Lis=[]
    n=int(input("Enter the limit of an List" ))
    for i in range(0,n):
    Lis.append(int(input("Enter element")))
    key=int(input("Enter key element"))
    for i in range(n):
        if Lis[i]==key:
            print(key, "Element is at position", i+1)
            break
    else:
       print("Element not found")
    print("")
    k=k+1
```

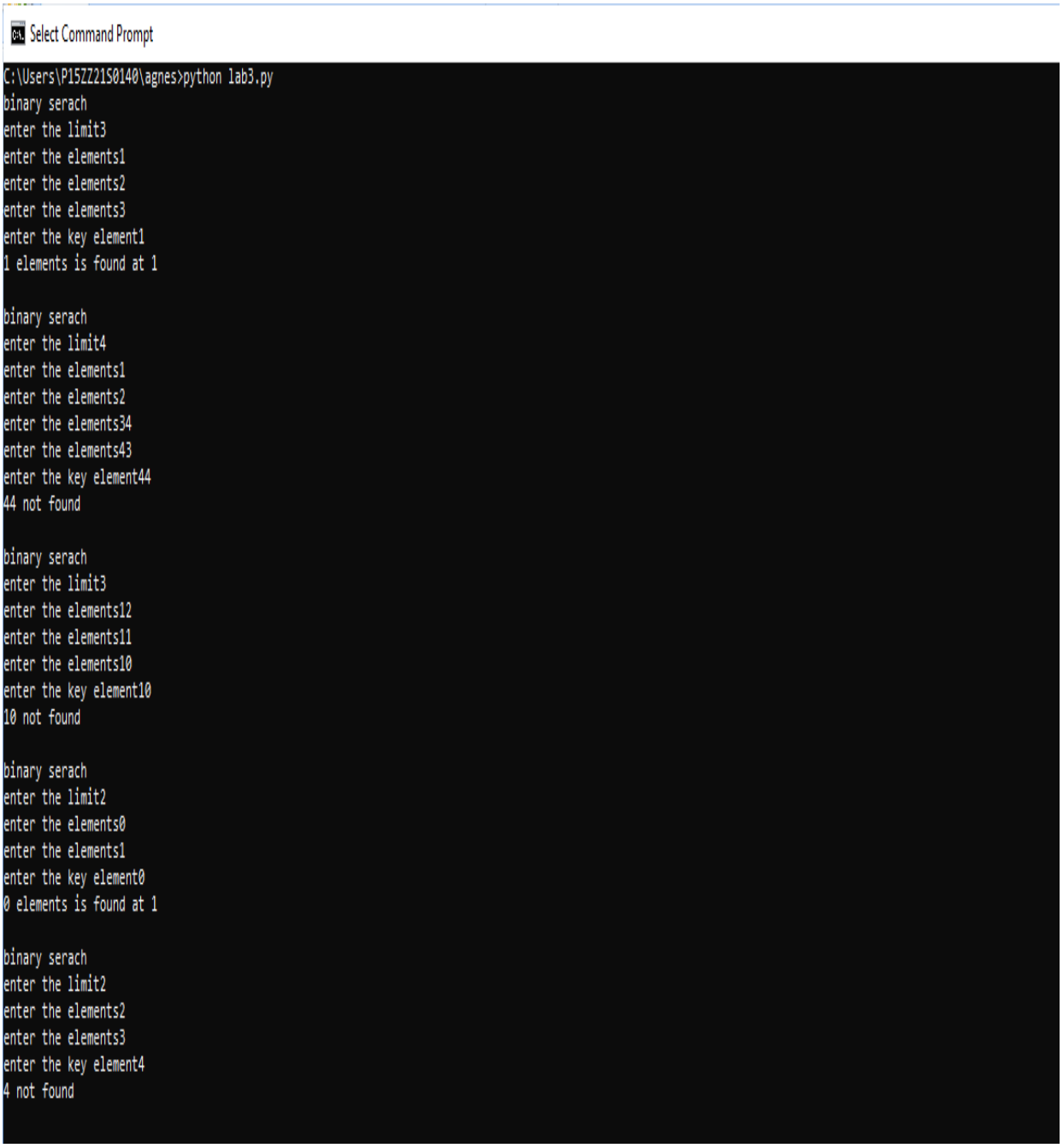
**OUTPUT :**


Select Command Prompt
Microsoft Windows [Version 10.0.19045.2728]
(c) Microsoft Corporation. All rights reserved.
C:\Users\P15ZZ21S0140\agnes>python lab2.py
linear serach
enter the limit3
enter the elements1
enter the elements2
enter the elements3
enter the key element2
2 is found at position 2
linear serach
enter the limit4
enter the elements1
enter the elements2
enter the elements3
enter the elements4
enter the key element5
5 element not found
linear serach
enter the limit2
enter the elements0
enter the elements1
enter the key element0
0 is found at position 1
linear serach
enter the limit1
enter the elements45
enter the key element46
46 element not found
linear serach
enter the limit3
enter the elements23
enter the elements22
enter the elements21
enter the key element22
22 is found at position 2

**Program 4: Write a program to search an element using binary search.**

```
k=1
n=5
for k in range(n):
    print("Binary search")
    arr = []
    n = int(input("Enter limit of array:"))
    print("enter elements ")
    for i in range(0,n):
        arr.append(int(input("Enter element:")))
    key = int(input("Enter key element:"))
    low = 0
    high = n-1
    while (low<=high):
        mid = round((low+high)/2)
        if(key == arr[mid]):
            print(key," is present at position ", mid+1)
            break
        elif key > arr[mid]:
            low = 1 + mid
        elif key < arr[mid]:
            high = mid - 1
    else:
        print(key, " not present in array")
    print("")
    k+=1
```

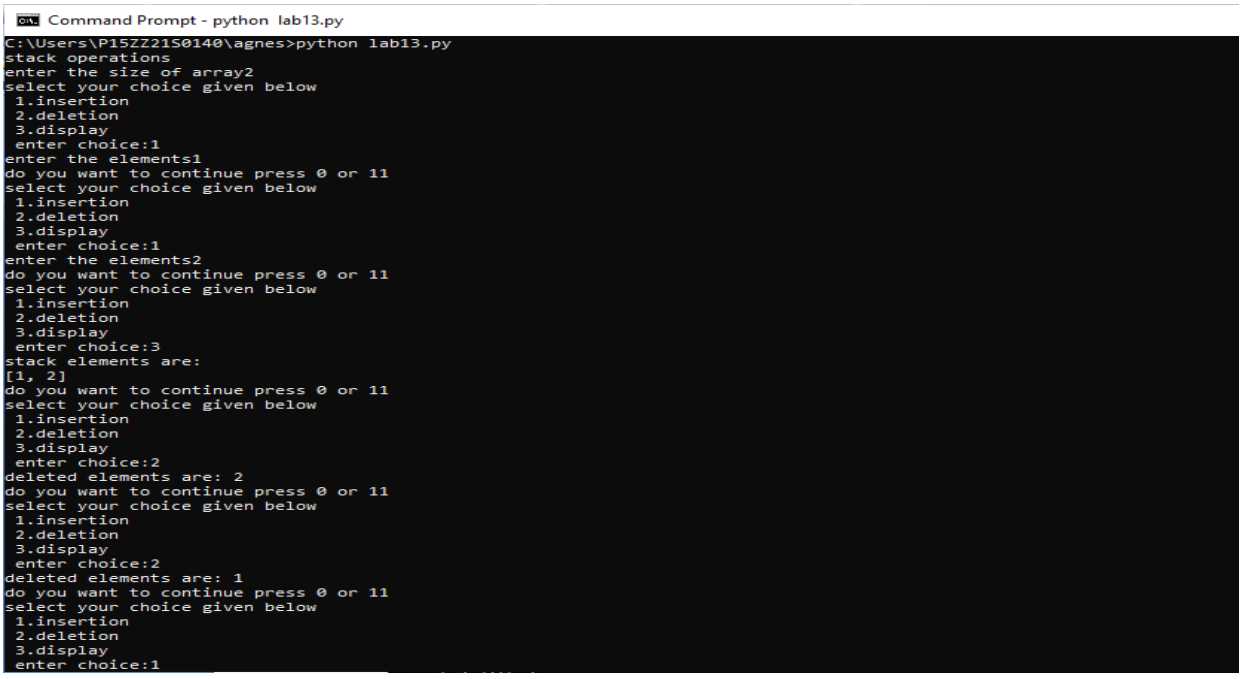
**OUTPUT :**

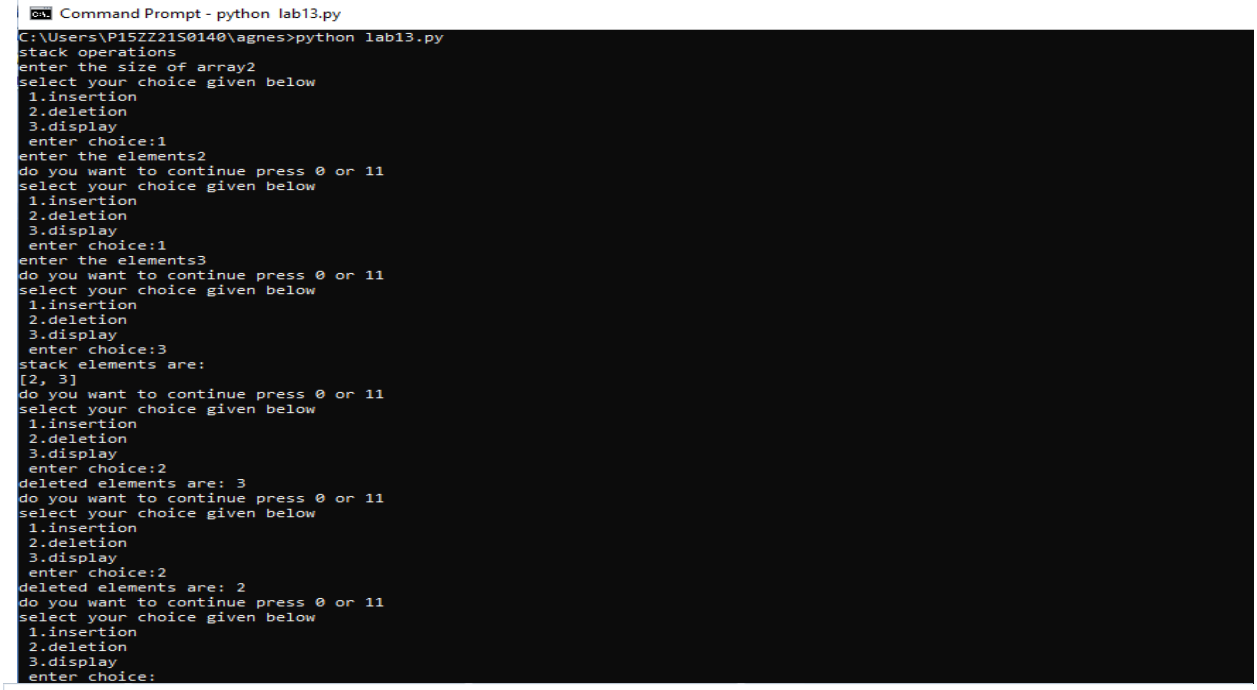

Select Command Prompt
C:\Users\P15ZZ21S0140\agnes>python lab3.py
binary serach
enter the limit3
enter the elements1
enter the elements2
enter the elements3
enter the key element1
1 elements is found at 1
binary serach
enter the limit4
enter the elements1
enter the elements2
enter the elements34
enter the elements43
enter the key element44
44 not found
binary serach
enter the limit3
enter the elements12
enter the elements11
enter the elements10
enter the key element10
10 not found
binary serach
enter the limit2
enter the elements0
enter the elements1
enter the key element0
0 elements is found at 1
binary serach
enter the limit2
enter the elements2
enter the elements3
enter the key element4
4 not found

## Program 5: Write a program to simulate stack.

```
print ("Stack operations")
arr = []
n = int(input("Enter limit of stack "))
i = 1
top = -1
while (i==1):
   ch = int(input("Select your choice given below\n 1.Insertion\n 2.Deletion\n 3.Display\n Enter Choice :"))
   if ch == 1:
      if(top>=n-1):
         print("Stack is overflow")
      else:
         ele = arr.append((input("Enter a element ")))
         top = top + 1
   elif ch == 2:
      if(top==-1):
         print("Stack is empty")
      else:
         print("Deleted element is ",arr[top])
         arr.pop()
   elif ch == 3:
      print("Stack elements are : ")
      print(arr)
   else:
       print("Invalid choice")
   i = int(input(" Do yopu want to Continue press 1 or press 0 : "))
```

## OUTPUT :


Command Prompt - python lab13.py
C:\Users\P15ZZ21S0140\agnes>python lab13.py
stack operations
enter the size of array2
select your choice given below
1.insertion
2.deletion
3.display
enter choice:1
enter the elements1
do you want to continue press 0 or 11
select your choice given below
1.insertion
2.deletion
3.display
enter choice:1
enter the elements2
do you want to continue press 0 or 11
select your choice given below
1.insertion
2.deletion
3.display
enter choice:3
stack elements are:
[1, 2]
do you want to continue press 0 or 11
select your choice given below
1.insertion
2.deletion
3.display
enter choice:2
deleted elements are: 2
do you want to continue press 0 or 11
select your choice given below
1.insertion
2.deletion
3.display
enter choice:2
deleted elements are: 1
do you want to continue press 0 or 11
select your choice given below
1.insertion
2.deletion
3.display
enter choice:1

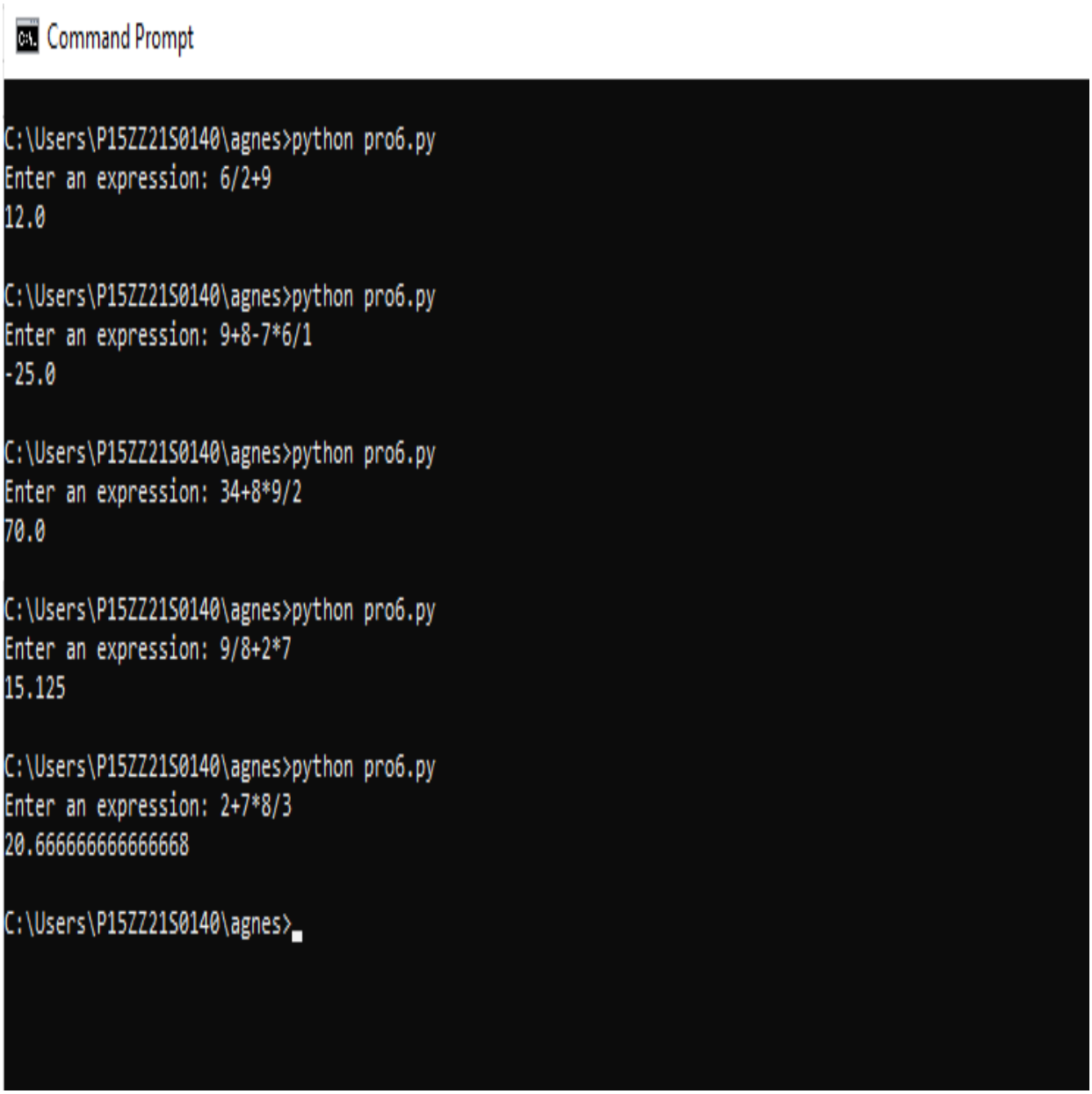

Command Prompt - python lab13.py
C:\Users\P15ZZ21S0140\agnes>python lab13.py
stack operations
enter the size of array2
select your choice given below
1.insertion
2.deletion
3.display
enter choice:1
enter the elements2
do you want to continue press 0 or 11
select your choice given below
1.insertion
2.deletion
3.display
enter choice:1
enter the elements3
do you want to continue press 0 or 11
select your choice given below
1.insertion
2.deletion
3.display
enter choice:3
stack elements are:
[2, 3]
do you want to continue press 0 or 11
select your choice given below
1.insertion
2.deletion
3.display
enter choice:2
deleted elements are: 3
do you want to continue press 0 or 11
select your choice given below
1.insertion
2.deletion
3.display
enter choice:2
deleted elements are: 2
do you want to continue press 0 or 11
select your choice given below
1.insertion
2.deletion
3.display
enter choice:


Command Prompt - python lab13.py
3.display
enter choice:3
stack elements are:
[]
do you want to continue press 0 or 10

## Program 06: Using a Stack Evaluate an arithmetic expression.

```
def evaluate_expression(expression):
    operand = []
    operator = []
    precedence = ['+', '-', '*', '/']

    for token in expression:
        if token.isdigit():
            operand.append(int(token))
        elif token in precedence:
            operator.append(token)

    while operator:
        right_operand = operand.pop()
        left_operand = operand.pop()
        opr = operator.pop()

        if opr == '+':
            result = left_operand + right_operand
        elif opr == '-':
            result = left_operand - right_operand
        elif opr == '*':
            result = left_operand * right_operand
        elif opr == '/':
            result = left_operand / right_operand

        operand.append(result)
    return operand.pop()


expression = input("Enter an expression: ")
result = evaluate_expression(expression)
print(eval(expression))
```

**OUTPUT :**

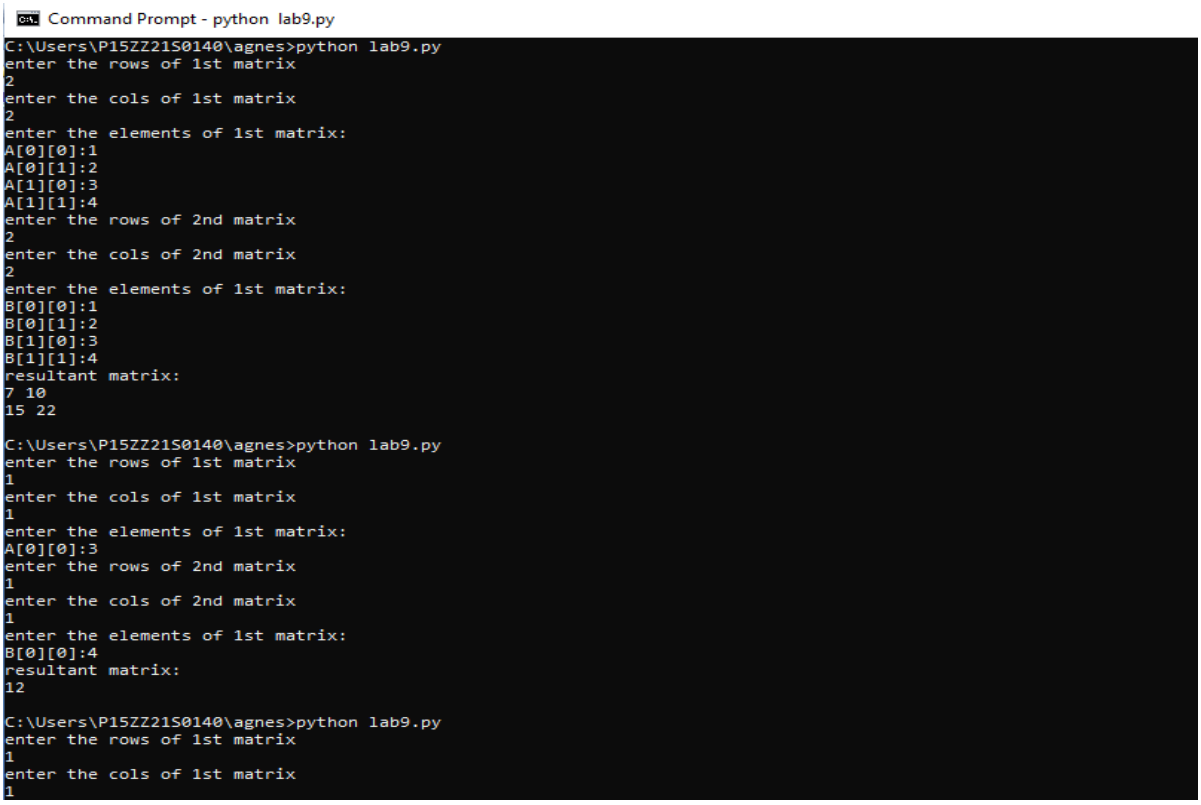

Command Prompt
C:\Users\P15ZZ21S0140\agnes>python pro6.py
Enter an expression: 6/2+9
12.0
C:\Users\P15ZZ21S0140\agnes>python pro6.py
Enter an expression: 9+8-7*6/1
-25.0
C:\Users\P15ZZ21S0140\agnes>python pro6.py
Enter an expression: 34+8*9/2
70.0
C:\Users\P15ZZ21S0140\agnes>python pro6.py
Enter an expression: 9/8+2*7
15.125
C:\Users\P15ZZ21S0140\agnes>python pro6.py
Enter an expression: 2+7*8/3
20.666666666666668
C:\Users\P15ZZ21S0140\agnes>

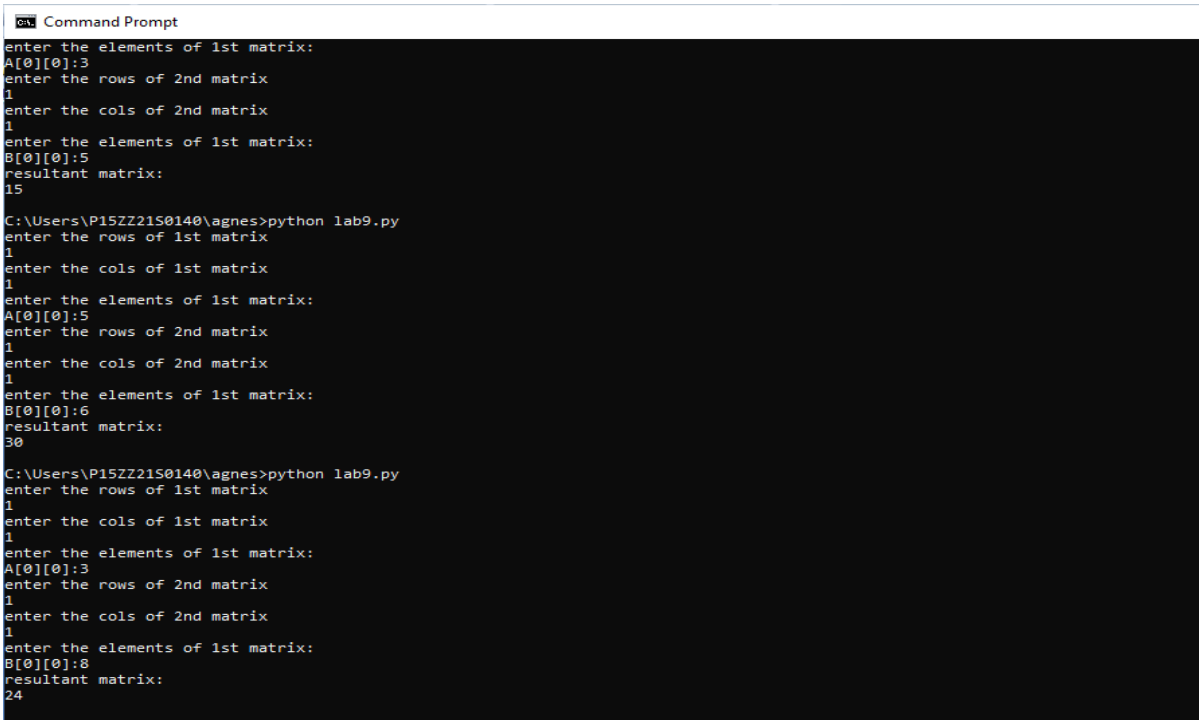
## Program 07: Write a program to multiply two matrices.

```
MAX = 100
A = [[0 for i in range(MAX)] for j in range(MAX)]
B = [[0 for i in range(MAX)] for j in range(MAX)]


row1 = int(input("Enter the number of rows of First Matrix: "))

col1 = int(input("Enter the number of columns of First Matrix: "))


print("Enter the elements of First Matrix: ");

for i in range(row1) :

    for j in range(col1) :

        A[i][j] = int(input("A[" + str(i) + "][" + str(j) + "]: "))


row2 = int(input("Enter the number of rows of Second Matrix: "))

col2 = int(input("Enter the number of columns of Second Matrix: "))


print("Enter the elements of Second Matrix: ");

for i in range(row2) :

     for j in range(col2) :

        B[i][j] = int(input("B[" + str(i) + "][" + str(j) + "]: "))


C = [[0 for i in range(MAX)] for j in range(MAX)]

if (row2 != col1) :

    print("number of rows and number of coloumns of two matrices are not equal so
multiflication is not possible")

else:

    for i in range(row1) :

        for j in range(col2) :
```

```
            C[i][j] = 0
            for k in range(row2) :
                C[i][j] += A[i][k] * B[k][j];


print("Resultant Matrix: ")
for i in range(row1) :
        for j in range(col2) :
            print(C[i][j], end = " ")
        print()
```

## OUTPUT:

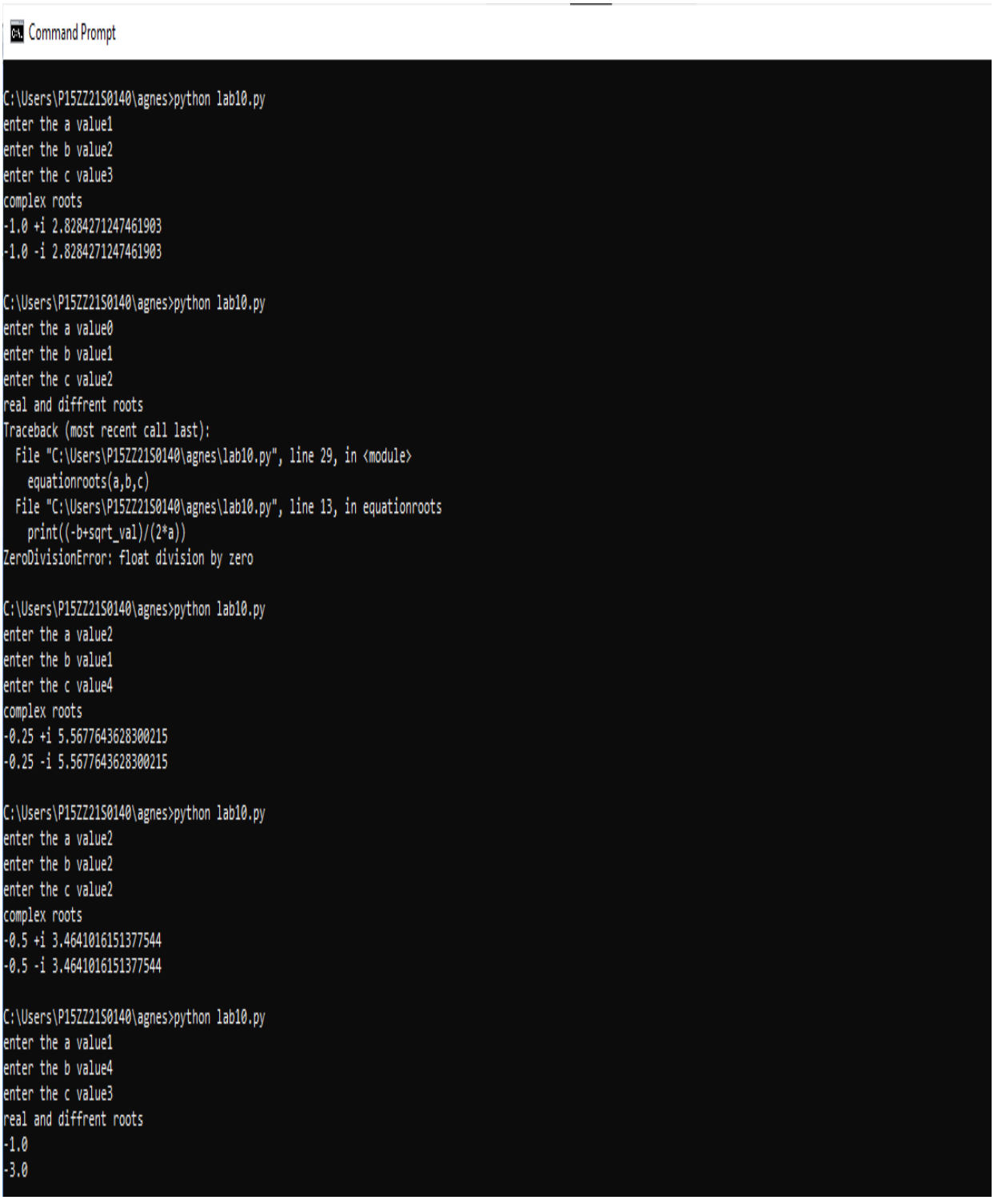

Command Prompt - python lab9.py
C:\Users\P15ZZ21S0140\agnes>python lab9.py
enter the rows of 1st matrix
2
enter the cols of 1st matrix
2
enter the elements of 1st matrix:
A[0][0]:1
A[0][1]:2
A[1][0]:3
A[1][1]:4
enter the rows of 2nd matrix
2
enter the cols of 2nd matrix
2
enter the elements of 1st matrix:
B[0][0]:1
B[0][1]:2
B[1][0]:3
B[1][1]:4
resultant matrix:
7 10
15 22
C:\Users\P15ZZ21S0140\agnes>python lab9.py
enter the rows of 1st matrix
1
enter the cols of 1st matrix
1
enter the elements of 1st matrix:
A[0][0]:3
enter the rows of 2nd matrix
1
enter the cols of 2nd matrix
1
enter the elements of 1st matrix:
B[0][0]:4
resultant matrix:
12
C:\Users\P15ZZ21S0140\agnes>python lab9.py
enter the rows of 1st matrix
1
enter the cols of 1st matrix
1


Command Prompt
enter the elements of 1st matrix:
A[0][0]:3
enter the rows of 2nd matrix
1
enter the cols of 2nd matrix
1
enter the elements of 1st matrix:
B[0][0]:5
resultant matrix:
15
C:\Users\P15ZZ21S0140\agnes>python lab9.py
enter the rows of 1st matrix
1
enter the cols of 1st matrix
1
enter the elements of 1st matrix:
A[0][0]:5
enter the rows of 2nd matrix
1
enter the cols of 2nd matrix
1
enter the elements of 1st matrix:
B[0][0]:6
resultant matrix:
30
C:\Users\P15ZZ21S0140\agnes>python lab9.py
enter the rows of 1st matrix
1
enter the cols of 1st matrix
1
enter the elements of 1st matrix:
A[0][0]:3
enter the rows of 2nd matrix
1
enter the cols of 2nd matrix
1
enter the elements of 1st matrix:
B[0][0]:8
resultant matrix:
24

## Program 8: Write a program to find the roots of a quadratic equation.

```
import math
a = int(input("Enter the a value:"))
b = int(input("Enter the b value:"))
c = int(input("Enter the c value:"))

def equationroots( a, b, c):

    dis = b * b - 4 * a * c
    sqrt_val = math.sqrt(abs(dis))

    if dis > 0:
        print(" real and different roots ")
        print((-b + sqrt_val)/(2 * a))
        print((-b - sqrt_val)/(2 * a))

    elif dis == 0:
        print(" real and same roots")
        print(-b / (2 * a))

    else:
        print("Complex Roots")
        print(- b / (2 * a), " + i", sqrt_val)
        print(- b / (2 * a), " - i", sqrt_val)

if a == 0:
        print("Input correct quadratic equation")


equationroots(a, b, c)
```

**OUTPUT:**


Command Prompt
C:\Users\P15ZZ21S0140\agnes>python lab10.py
enter the a value1
enter the b value2
enter the c value3
complex roots
-1.0 +i 2.8284271247461903
-1.0 -i 2.8284271247461903
C:\Users\P15ZZ21S0140\agnes>python lab10.py
enter the a value0
enter the b value1
enter the c value2
real and diffrent roots
Traceback (most recent call last):
File "C:\Users\P15ZZ21S0140\agnes\lab10.py", line 29, in <module>
equationroots(a,b,c)
File "C:\Users\P15ZZ21S0140\agnes\lab10.py", line 13, in equationroots
print((-b+sqrt_val)/(2*a))
ZeroDivisionError: float division by zero
C:\Users\P15ZZ21S0140\agnes>python lab10.py
enter the a value2
enter the b value1
enter the c value4
complex roots
-0.25 +i 5.5677643628300215
-0.25 -i 5.5677643628300215
C:\Users\P15ZZ21S0140\agnes>python lab10.py
enter the a value2
enter the b value2
enter the c value2
complex roots
-0.5 +i 3.4641016151377544
-0.5 -i 3.4641016151377544
C:\Users\P15ZZ21S0140\agnes>python lab10.py
enter the a value1
enter the b value4
enter the c value3
real and diffrent roots
-1.0
-3.0

## Program 09: Write a program to insert a number in sorted array.

```
print("Sorting  an array")
arr=[]
n=int(input("Enter limit of an array:"))
print("Enter elements")
i=0
while (i<n):
    ele=int(input())
    arr.append(ele)
    i=i+1
print("Entered elemets are:")
print(arr)
arr.sort()
print("Sorted elemets are:")
print(arr)
ele=int(input("Enter a new element: "))
index=int(input("Enter index value: "))
arr.insert(index,ele)
print(arr)
arr.sort()
print("Sorted elemets are:")
print(arr)
```

## OUTPUT:

Command Prompt

```
13
11
entered elements:
[12, 13, 11]
sorting elements:
[11, 12, 13]
enter the new elements10
enter the index of value2
[11, 12, 10, 13]
sorted elements:
[11, 12, 10, 13]

C:\Users\P15ZZ21S0140\agnes>python lab8.py
sorting array elements
enter the limit of an array
2
enter the elements

22
21
entered elements:
[22, 21]
sorting elements:
[21, 22]
enter the new elements23
enter the index of value2
[21, 22, 23]
sorted elements:
[21, 22, 23]

C:\Users\P15ZZ21S0140\agnes>python lab8.py
sorting array elements
enter the limit of an array
3
enter the elements

1
3
4
entered elements:
[1, 3, 4]
sorting elements:
[1, 3, 4]
enter the new elements5
enter the index of value0
[5, 1, 3, 4]
sorted elements:
[5, 1, 3, 4]
```

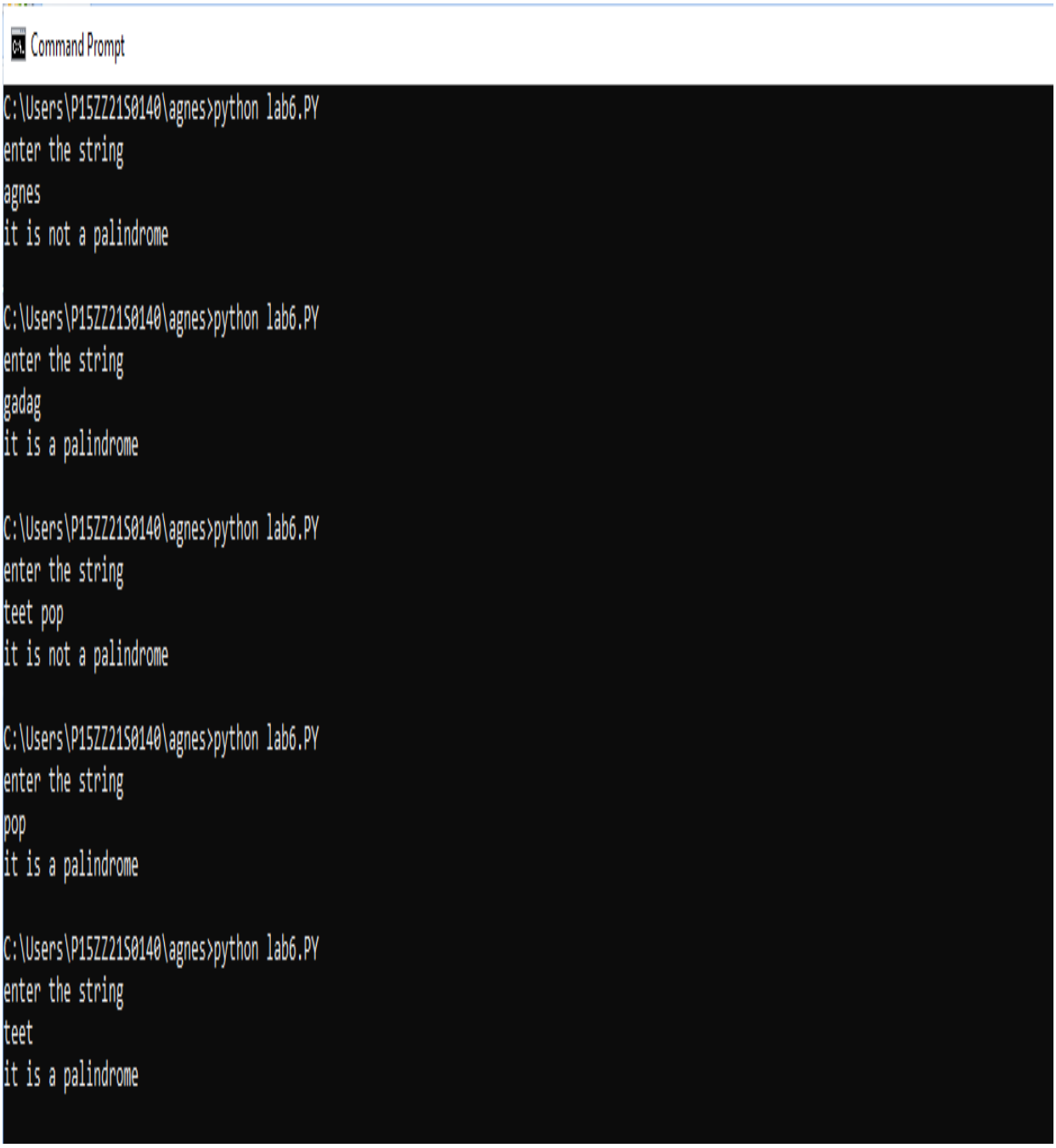
Command Prompt

```
C:\Users\P15ZZ21S0140\agnes>python lab8.py
sorting array elements
enter the limit of an array
2
enter the elements

12
11
entered elements:
[12, 11]
sorting elements:
[11, 12]
enter the new elements13
enter the index of value1
[11, 13, 12]
sorted elements:
[11, 13, 12]

C:\Users\P15ZZ21S0140\agnes>python lab8.py
sorting array elements
enter the limit of an array
3
enter the elements

12
21
22
entered elements:
[12, 21, 22]
sorting elements:
[12, 21, 22]
enter the new elements23
enter the index of value2
[12, 21, 23, 22]
sorted elements:
[12, 21, 23, 22]
```

**Program 10:Write a Python Program to check whether the given string is palindrome or not using built in string manipulation methods.**

```
string=input("enter the string")

def palindrome(str):
    if string==string[::-1]:
        print("it is a palindrome")
    else:
        print("it is not a palindrome")

palindrome(str)
```

**OUTPUT:**


Command Prompt
C:\Users\P15ZZ21S0140\agnes>python lab6.PY
enter the string
agnes
it is not a palindrome
C:\Users\P15ZZ21S0140\agnes>python lab6.PY
enter the string
gadag
it is a palindrome
C:\Users\P15ZZ21S0140\agnes>python lab6.PY
enter the string
teet pop
it is not a palindrome
C:\Users\P15ZZ21S0140\agnes>python lab6.PY
enter the string
pop
it is a palindrome
C:\Users\P15ZZ21S0140\agnes>python lab6.PY
enter the string
teet
it is a palindrome

**Program 11: Write a Python program to read a word and print the number of letters, vowels and percentage of vowels in the word using dictionary.**

```
d1={}
n=int(input("enter a number of values to insert into dictionary:"))
for i in range(n):
    key=input("enter key:")
    d1[key]=input("enter a value:")
print(d1)


def dic(dictx):
    for j in(dictx.values()):
        vowels=0


        for i in j:
            if(i=='a' or i=='e' or i=='i' or i=='o' or i=='u' or i=='A'  or i=='E'  or i=='I' or i='0' or i=='U'):
                vowels=vowels+1
        print("Number of characters in word are:",len(j))
        print("Number of vowels in words are:")
        print(vowels)
        vper=(vowels/len(j)*100)
        print("percentage:",vper)


dic(d1)
```

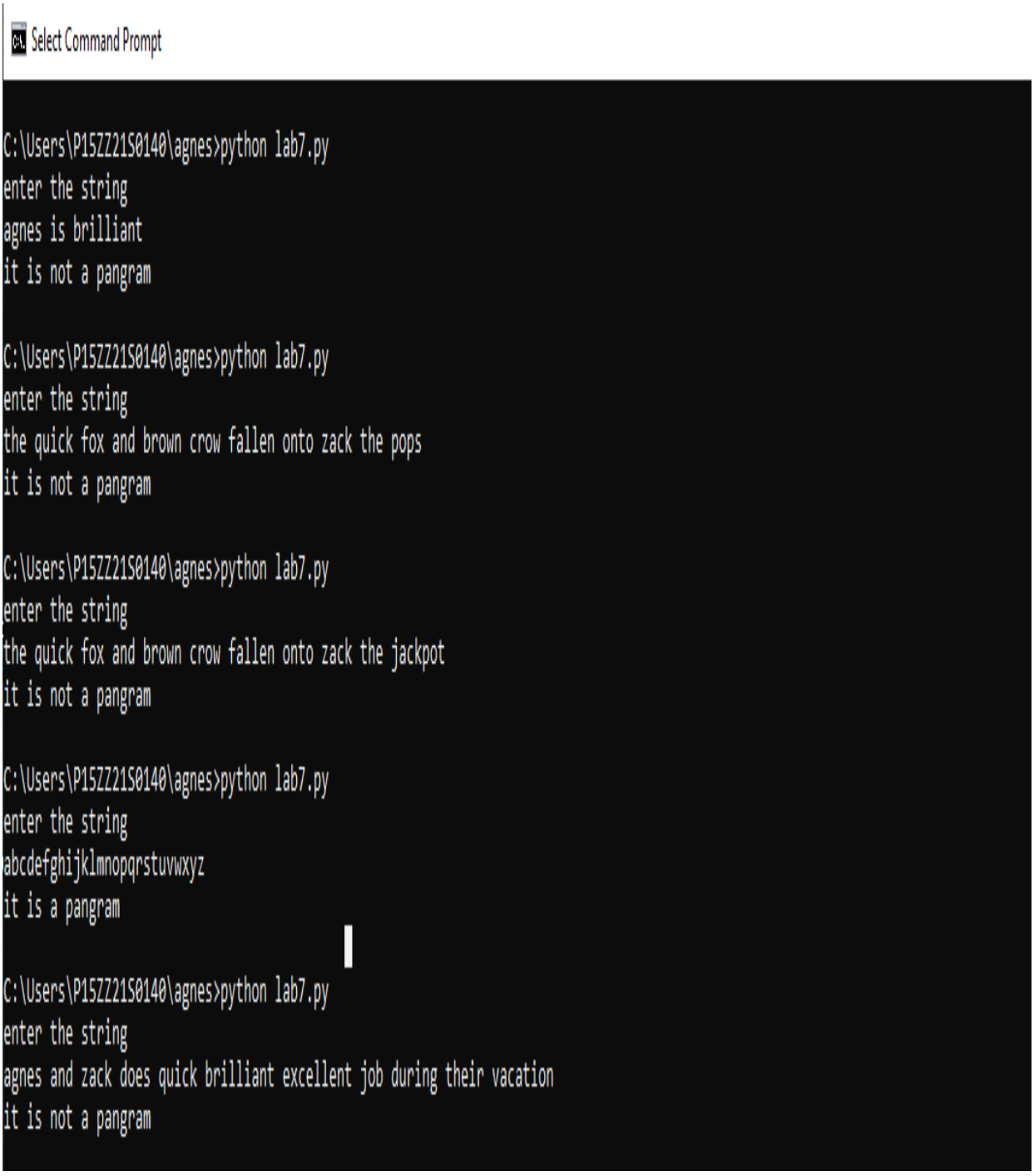
**OUTPUT:**


Command Prompt
C:\Users\P15ZZ21S0140\agnes>python lab11.py
enter the values to insert into the dictionary1
enter key5
enter the values:meghraj
{'5': 'meghraj'}
number of characters in word are: 7
number of vowels in word are:
2
percentage 28.57142857142857
C:\Users\P15ZZ21S0140\agnes>python lab11.py
enter the values to insert into the dictionary1
enter key1
enter the values:agnes
{'1': 'agnes'}
number of characters in word are: 5
number of vowels in word are:
2
percentage 40.0
C:\Users\P15ZZ21S0140\agnes>python lab11.py
enter the values to insert into the dictionary1
enter key2
enter the values:alex
{'2': 'alex'}
number of characters in word are: 4
number of vowels in word are:
2
percentage 50.0
C:\Users\P15ZZ21S0140\agnes>python lab11.py
enter the values to insert into the dictionary1
enter key3
enter the values:reem
{'3': 'reem'}
number of characters in word are: 4
number of vowels in word are:
2
percentage 50.0
C:\Users\P15ZZ21S0140\agnes>python lab11.py
enter the values to insert into the dictionary1
enter key1
enter the values:leen
{'1': 'leen'}
number of characters in word are: 4
number of vowels in word are:
2
percentage 50.0

**Program 12: Write a Python Program to check a given sentence is a pangram or not using function/Module.**

```
import string
string = input("Enter the string:")

def ispangram(str):
    alphabet = "abcdefghijklmnopqrstuvwxyz"
    for char in alphabet:
        if char not in str.lower():
            return False

    return True


if(ispangram(string) == True):
    print("This is pangram")
else:
    print("This is not pangram")
```

**OUTPUT:**


Select Command Prompt
C:\Users\P15ZZ21S0140\agnes>python lab7.py
enter the string
agnes is brilliant
it is not a pangram
C:\Users\P15ZZ21S0140\agnes>python lab7.py
enter the string
the quick fox and brown crow fallen onto zack the pops
it is not a pangram
C:\Users\P15ZZ21S0140\agnes>python lab7.py
enter the string
the quick fox and brown crow fallen onto zack the jackpot
it is not a pangram
C:\Users\P15ZZ21S0140\agnes>python lab7.py
enter the string
abcdefghijklmnopqrstuvwxyz
it is a pangram
C:\Users\P15ZZ21S0140\agnes>python lab7.py
enter the string
agnes and zack does quick brilliant excellent job during their vacation
it is not a pangram