Lab1:-

Question 1:-

print("Your Calculated Force is:", (float(input("Enter Mass: ")) * float(input("Enter Acceleration: "))))

```
Enter Mass: 5
Enter Acceleration: 6
Your Calculated Force is: 30.0
```

Question 2:-

```
print(input("Enter Your Name: ") + " is " + input("Enter Your Age: ") + " year
old and lives in " + input("Enter Your Country: ") + ".")
```

```
Enter Your Name: Zaid Qasim
Enter Your Age: 18
Enter Your Country: Pakistan
Zaid Qasim is 18 year old and lives in Pakistan.
```

Lab 2:-

Question 1:-

```
import numpy as np
def insert(End_value,Start_value,value):
  for i in range(End_value,Start_value,-1):
    arr[i] = i - 1
  arr[Start_value] = value
arr = np.array([input(f"Enter Player {i+1} Name: ") for i in range (int(input("How Many Player
are there: "))])
for x in range(len(arr)):
  print(arr[x],end="")
```

```
How Many Player are there: 4
Enter Player 1 Name: Z
Enter Player 2 Name: a
Enter Player 3 Name: i
Enter Player 4 Name: d
Zaid>
```

Question 2:-

```
import numpy as np
thislist = []
length = int(input("How Many Player are there: "))
value = input("Enter Value: ")
index = int(input("Enter Index: "))
arr = np.array(["" for i in range (length + 1)])
for i in range(length):
        arr[i] = input("How Many Player are there: ")
for i in range(length):
        thislist.insert(i, arr[i])
print("Given Array = ",thislist)
thislist.insert(index,value)
for i in range(4):
        arr[i] = thislist[i]
print(arr)
```

```
How Many Player are there: 3
Enter Value: i
Enter Index: 2
How Many Player are there: Z
How Many Player are there: a
How Many Player are there: d
Given Array =  ['Z', 'a', 'd']
['Z' 'a' 'i' 'd']
```

Question 3:-

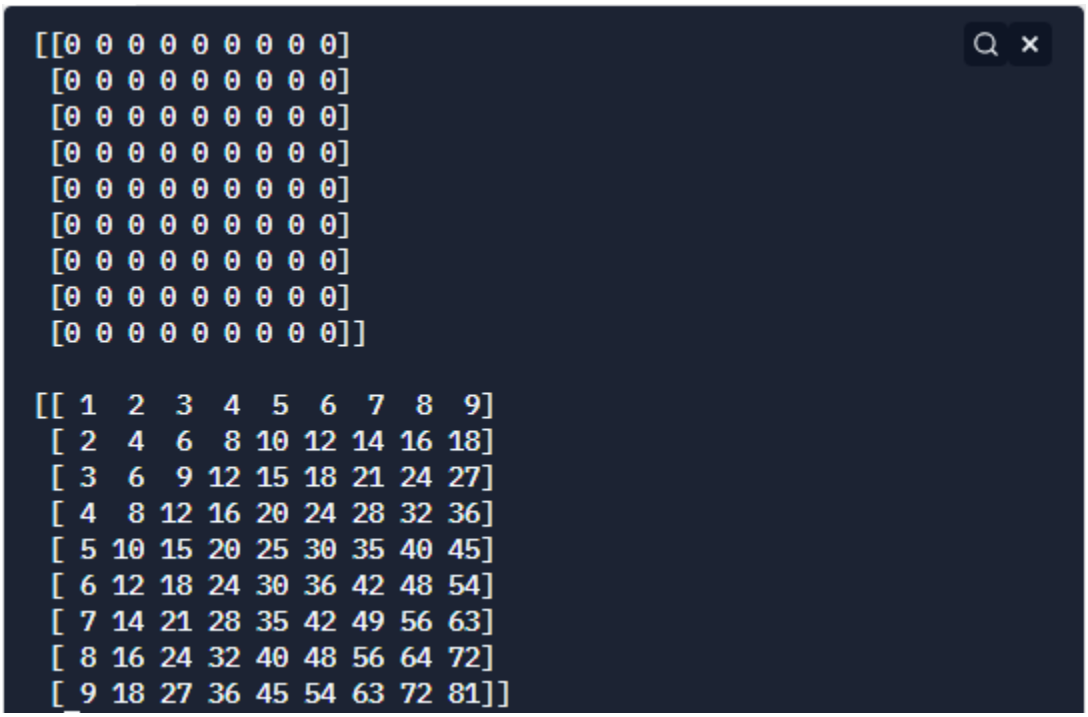
```
import numpy as np
thislist = []
length = int(input("Enter Length: "))
index = int(input("Enter Index: "))
arr = np.array(["" for i in range (length)])
for i in range(length):
        arr[i] = input("Enter Array: ")
for i in range(length):
        thislist.insert(i, arr[i])
print(thislist)
thislist.pop(index)
arr[length-1] = ""
for i in range(length-1):
   arr[i] = thislist[i]
print(arr)
```

```
Enter Length: 5
Enter Index: 0
Enter Array: i
Enter Array: Z
Enter Array: a
Enter Array: i
Enter Array: d
['i', 'Z', 'a', 'i', 'd']
['Z' 'a' 'i' 'd' '']
```

Lab 3:-

Question 1:-

```
from numpy import array
Array_1 = array([[0 for i in range(1,10)]for j in range(1,10)])
print(Array_1)
for i in range(0,9):
        for j in range(0,9):
                Array_1[i][j] = (i+1)*(j+1);
print()
print(Array_1)
```



```
[[0 0 0 0 0 0 0 0 0]
 [0 0 0 0 0 0 0 0 0]
 [0 0 0 0 0 0 0 0 0]
 [0 0 0 0 0 0 0 0 0]
 [0 0 0 0 0 0 0 0 0]
 [0 0 0 0 0 0 0 0 0]
 [0 0 0 0 0 0 0 0 0]
 [0 0 0 0 0 0 0 0 0]
 [0 0 0 0 0 0 0 0 0]]

[[ 1  2  3  4  5  6  7  8  9]
 [ 2  4  6  8 10 12 14 16 18]
 [ 3  6  9 12 15 18 21 24 27]
 [ 4  8 12 16 20 24 28 32 36]
 [ 5 10 15 20 25 30 35 40 45]
 [ 6 12 18 24 30 36 42 48 54]
 [ 7 14 21 28 35 42 49 56 63]
 [ 8 16 24 32 40 48 56 64 72]
 [ 9 18 27 36 45 54 63 72 81]]
```

Question 2:-

```
from numpy import array
m1 = array([[1,2,3,4],[5,6,7,8]])
m2 = array([[1,2,3],[4,5,6],[7,8,9],[10,11,12]])
m = array([[0 for i in range(3)]for j in range(2)],dtype = object)
for i in range(2):
        for j in range(4):
                for k in range(3):
                        m[i][k] = m[i][k] + (m1[i][j] * m2[j][k])
print(m)
```

```
[[70 80 90]
 [158 184 210]]
```

Question 3:-

```
from numpy import array
Array_1 = array([[1,2,3],[4,5,6],[9,8,9]])
Value = 0
Value0 = 0
for i in range(3):
        Value = Value + Array_1[i][i]
t = 2
for i in range(3):
        Value0 = Value0 + Array_1[i][t]
        t = t -1
Value = Value - Value0
if Value < 0:
        Value = -1 * Value
print(Value)
```

```
2 _
```

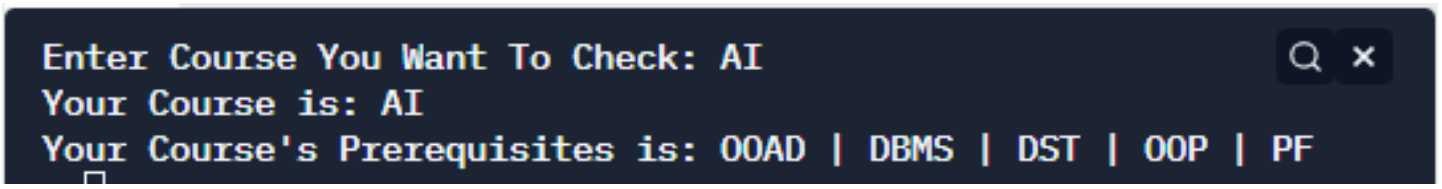
Lab7:-

Question 1:-

```
class Node:
  def __init__(self, data):
    self.data = data
    self.next = None
    self.prev = None
class LinkedList:
        def __init__(self):
                self.head = None
        def PrintList(self, course):
                temp = self.head
                        if(temp != None):
                                while (temp != None):
                                if(temp.data == course):
                                        print("Your Course is:",temp.data)
                                        print("Your Course's Prerequisites is: ",end="")
                        while(temp.prev != None):
                                temp = temp.prev
                                if (temp.prev != None):
                                                print(f"{temp.data}",end=" | ")
                                        break
                                temp = temp.next
                        print(temp.data)
                else:
                        print("The list is empty.")

MyList = LinkedList()
first = Node("PF")
MyList.head = first
second = Node("OOP")
second.prev = first
first.next = second
third = Node("DST")
third.prev = second
second.next = third
fourth = Node("DBMS")
fourth.prev = third
third.next = fourth
fifth = Node("OOAD")
fifth.prev = fourth
fourth.next = fifth
```

```
sixth = Node("AI")
sixth.prev = fifth
fifth.next = sixth
seventh = Node("DP")
seventh.prev = seventh
sixth.next = seventh
MyList.PrintList(input("Enter Course You Want To Check: "))
```



Question 2:-

```
class Node:
        def __init__(self, data):
        self.data = data
         self.next = None
        self.prev = None
class LinkedList:
        def __init__(self):
                self.head = None
        def push_back(self, newElement):
                newNode = Node(newElement)
                 if(self.head == None):
                        self.head = newNode
                        return
                else:
                        temp = self.head
                        while(temp.next != None):
                                temp = temp.next
                        temp.next = newNode
                        newNode.prev = temp
        def push_at(self):
                nodeToDelete = self.head
                self.head = nodeToDelete.next
                self.head.prev = None
                nodeToDelete = None
                temp = self.head
                while(temp.next != None):
```

```
                    temp = temp.next
                    temp = temp.prev
                    temp.next = 0
        def PrintList(self):
            temp = self.head
        if(temp != None):
            print("The list contains:", end=" ")
            while (temp != None):
                if (temp == 0):
                    break
                else:
                    print(temp.data, end=" ")
                    temp = temp.next
                print()
        else:
            print("The list is empty.")
MyList = LinkedList()
MyList.push_back(10)
MyList.push_back(20)
MyList.push_back(30)
MyList.PrintList()
MyList.push_at()
MyList.PrintList()
```

```
The list contains: 10 20 30
The list contains: 20 30
```

Lab8:-

Question 1:-

```
class Node:
    def __init__(self, data):
        self.data = data
        self.next = None
class LinkedList:
    def __init__(self):
        self.start = None
    def Push(self, value):
        newNode = Node(value)
        if(self.start == None):
            self.start = newNode
            return
        else:
            temp = self.start
        while(temp.next != None):
            temp = temp.next
        temp.next = newNode
    def Print(self):
        temp = self.start
        i = 1
        if(temp != None):
            while (temp != None):
                print(f"{i}.",temp.data, end = " \t")
                i = i + 1
                temp = temp.next
        else:
            print("The list is now empty.")
        print()
        print()
    def Pop(self):
        temp0 = self.start
        temp1 = temp0.next
        if(temp0 != None):
            while (temp1.next != None):
                temp0 = temp0.next
                if(temp0.data == self.start):
                    break
                temp1 = temp0.next

            temp0.next = None
```

```
        print("Your Poped Item is:",temp1.data)
        temp1.next = None
MyList = LinkedList()
MyList.Push(10)
MyList.Push(20)
MyList.Push(30)
MyList.Pop()
MyList.Pop()
```

```
Your Poped Item is: 30
Your Poped Item is: 20
```

Question 2:-

```
def Push(array, top, max, item):
   if(top == max):
      print("Sorry :( Your Stack is Full")
   else:
      top[0] += 1
      array[top[0]] = item
def Pop(array, top):
   item = 0
   if(top[0] == -1):
      print("Enter Elemet First")
   else:
      for x in range(top[0],-1,-1):
         print(array[top[0]],end="")
         array[top[0]] = 0
         top[0] -= 1
max = int(input("Enter Number Of Element: "))
array = [0 for i in range(max)]
top = [-1]
for i in range(max):
   Push(array,top, max-1, input("Enter Item: "))
print("Your Array in reverse Order is: ",end="")
Pop(array, top)
print()
```

```
Enter Number Of Element: 5
Enter Item: 1
Enter Item: 2
Enter Item: 3
Enter Item: 4
Enter Item: 5
Your Array in reverse Order is: 54321
```