a) Write a python program to store roll numbers of student in array who attended training program in random order. Write function for searching whether particular student attended training program or not, using Linear search and Sentinel search.

```python
1  def LinearSearch(arr,x):
2    for i in range(len(arr)):
3      if arr[i] == x:
4        return x
5    return -1
6
7  def sentinelSearch(arr,key):
8      n = len(arr)
9      # Last element of the array
10     last = arr[n - 1]
11     # Element to be searched is
12     # placed at the last index
13     arr[n - 1] = key
14     i = 0
15     while (arr[i] != key):
16         i += 1
17
18     # Put the last element back
19     arr[n - 1] = last
20     if ((i < n - 1) or (arr[n - 1] == key)):
21         print("\nrollno "+str(key)+" attended training program"
            )
```

```python
22        else:
23            print("rollno "+str(key)+" not attended training
                    program")
24  def Continue():
25      ch=int(input("\nIf you want to Continue Enter 1:- \n"))
26      if ch==1:
27        menu()
28      else:
29        quit()
30
31  def menu():
32        arr = []
33        print("-_-_--_-_- Select Yor Choice -_-_--_-_-")
34        print("1. Linear Search")
35        print("2. Sentinel Search")
36        print("3. Exit")
37        ch=int(input("\nEnter Your Choice:- "))
38
39
```

```python
40        # Linear Search
41     if ch==1:
42         noofStudents = int(input("Enter total number of
                students:- "))
43         for i in range(noofStudents):
44           p=i+1
45           arr.append(int(input("Enter the rollno of "+str(p)+ "
                Students:- ")))
46
47         x=int(input("Enter rollno for Linear Search:- "))
48         print("\n-_-_- Entered list -_-_-\n",arr)
49         r= LinearSearch(arr,x)
50         if(r==x):
51           print("\nrollno "+str(r)+" attended training program"
                )
52         else:
53           print("\nrollno "+str(x)+" not attended training
                program")
54
55        # Sentinel Search
56     elif ch == 2:
57         noofStudents = int(input("Enter total number of
                students:- "))
58         for i in range(noofStudents):
59             p=i+1
60             arr.append(float(input("Enter the rollno of "+str(p
                )+ " Students:- ")))
61         x=int(input("Enter rollno for sentinel Search:- "))
62         print("\n-_-_- Entered list -_-_-\n",arr)
63         sentinelSearch(arr,x)
64
65        # Exit
66     elif ch==3:
67         quit()
68     Continue()
69  menu()
70  Continue()
71
```

```
-_-_--_-_- Select Yor Choice -_-_--_-_-
1. Linear Search
2. Sentinel Search
3. Exit


Enter Your Choice:-
```

b) Write a python program to store roll numbers of student array who attended training program in sorted order. Write function for searching whether particular student attended training program or not, using Binary search and Fibonacci search

```python
 1  def BinarySearch(arr,n):
 2     l = 0
 3     u = len(arr)-1
 4     while l <= u:
 5        mid = (l+u)//2
 6
 7        if arr[mid] == n:
 8            print("\nrollno "+str(n)+" attended training program")
 9            return True
10        else:
11            if arr[mid]< n:
12               l = mid + 1
13            else:
14               u = mid - 1
15     return False
16
17  def fibonacci_search(lst, target):
18      size = len(lst)
19      start = -1
20      f0 = 0
21      f1 = 1
```

```python
22          f2 = 1
23      while(f2 < size):
24          f0 = f1
25          f1 = f2
26          f2 = f1 + f0
27      while(f2 > 1):
28          index = min(start + f0, size - 1)
29          if lst[index] < target:
30              f2 = f1
31              f1 = f0
32              f0 = f2 - f1
33              start = index
34          elif lst[index] > target:
35              f2 = f0
36              f1 = f1 - f0
37              f0 = f2 - f1
38          else:
39              return True
40      if (f1) and (lst[size - 1] == target):
41
42      return None
43
44  def Continue():
45      ch=int(input("\nIf you want to Continue Enter 1:- \n"))
46      if ch==1:
47          menu()
48      else:
49          quit()
50
51  def menu():
52    arr = []
53    print("-_-_--_-_- Select Yor Choice -_-_--_-_-")
54    print("1. Binary Search")
55    print("2. Fibonacci Search")
56    print("3. Exit")
57
58    ch=int(input("\nEnter Your Choice:- "))
59    # Binary Search
60    if ch==1:
61        noofStudents = int(input("Enter total number of students:- "))
62
```

```python
62        for i in range(noofStudents):
63            p=i+1
64            arr.append(int(input("Enter the rollno of "+str(p)+ "
                 Students:- ")))
65        x=int(input("Enter rollno for Binary Search:- "))
66        print("\n-_-_- Entered list -_-_-\n",arr)
67        r= BinarySearch(arr,x)
68
69        if(r==False):
70            print("\nrollno", x ,"not attended training program")
71
72    # Fibonacci Search
73    elif ch==2:
74        noofStudents = int(input("Enter total number of students:- "))

75        for i in range(noofStudents):
76            p=i+1
77            arr.append(float(input("Enter the rollno of "+str(p)+ "
                 Students:- ")))
78        x=int(input("Enter rollno for fibonacci Search:- "))
79        print("\n-_-_- Entered list -_-_-\n",arr)
80        r = fibonacci_search(arr,x)
81        if(r==True):
82            print("\nrollno ",x," attended training program")
83        else:
84            print("\nrollno ",x," not attended training program")
85    # Exit
86
87    elif ch==3:
88            quit()
89            Continue()
90    menu()
91    Continue()
```