

```
# DSL - ASSIGNMENT 4 - B11
```

```
def linearSearch(arr, n):  
    val = int(input('Enter the Roll no you want to search using linear search: '))  
  
    for i in range(n):  
        if arr[i] == val:  
            print(f'Roll no {val} found at position {i + 1}')  
            return  
  
    print(f'Roll no {val} not found')  
    return
```

```
def sentinelSearch(arr, n):  
    val = int(input('\n\nEnter the Roll no you want to search using sentinal search: '))  
  
    last = arr[n - 1]  
  
    arr[n - 1] = val  
    i = 0  
  
    while (arr[i] != val):  
        i += 1  
  
    arr[n - 1] = last  
  
    if ((i < n - 1) or (val == arr[n - 1])):  
        print(f'Roll no {val} found at position {i + 1}')  
        return  
    else:  
        print(f'Roll no {val} not found')  
        return
```

```

def binarySearch(arr, n):
    val = int(input('Enter the Roll no you want to search using binary search: '))

    s = 0
    while s <= n:
        mid = (s + n) // 2
        if arr[mid] == val:
            print(f'Roll no {val} found at position {mid + 1}')
            return

        elif arr[mid] < val:
            s = mid + 1

        else:
            n = mid - 1

    print(f'Roll no {val} not found')
    return

def fibonacciSearch(arr, n):
    val = int(input('\n\nEnter the Roll no you want to search using fibonacci search: '))

    fib_2 = 0
    fib_1 = 1
    fib_N = fib_1 + fib_2

    if n == 0:
        return 0

    while fib_N < n:
        fib_2 = fib_1
        fib_1 = fib_N
        fib_N = fib_1 + fib_2

    index = -1

    while fib_N > 1:
        i = min(index + fib_2, (n - 1))
        if arr[i] < val:
            fib_N = fib_1
            fib_1 = fib_2
            fib_2 = fib_N - fib_1
            index = i
        elif arr[i] > val:
            fib_N = fib_2
            fib_1 = fib_1 - fib_2
            fib_2 = fib_N - fib_1
        else:
            print(f'Roll no {val} found at position {i + 1}')
            return

```

```
if (fib_1 and index < n - 1) and (arr[index + 1] == val):  
    print(f'Roll no {val} found at position {index + 2}')  
    return
```

```
print(f'Roll no {val} not found')  
return
```

```
def putdata(arr, n):  
    print('\n\nFollowing are the student\'s roll no who have attended training program... \n')  
    print('*****')  
    print('|    Position    |    Roll No    |')  
    print('*****')
```

```
for i in range(n):  
    print(f'| {i + 1} | {arr[i]} |')  
print('————— \n\n')
```

```
def main():  
    n = int(input('\nEnter the total strenght that have attended training program: '))  
    arr = []
```

```
for i in range(n):  
    arr.append(int(input(f'Enter the roll numbers: ')))  
putdata(arr, n)
```

```
linearSearch(arr, n)
```

```
sentinelSearch(arr, n)
```

```
arr.sort()  
print('\n\nSorting the roll numbers gives:')  
putdata(arr, n)
```

```
binarySearch(arr, n - 1)
```

```
fibonacciSearch(arr, n)
```

```
if __name__ == "__main__":  
    main()
```

"""

OUTPUT

Enter the total strenght that have attended training program: 10

Enter the roll numbers: 12

Enter the roll numbers: 82

Enter the roll numbers: 73

Enter the roll numbers: 34

Enter the roll numbers: 14

Enter the roll numbers: 98

Enter the roll numbers: 89

Enter the roll numbers: 11

Enter the roll numbers: 45

Enter the roll numbers: 29

Following are the student's roll no who have attended training program...

Position	Roll No
1	12
2	82
3	73
4	34
5	14
6	98
7	89
8	11
9	45
10	29

Enter the Roll no you want to search using linear search: 11

Roll no 11 found at position 8

Enter the Roll no you want to search using sentinal search: 14

Roll no 14 found at position 5

Sorting the roll numbers gives:

Following are the student's roll no who have attended training program...

Position	Roll No

1	11
2	12
3	14
4	29
5	34
6	45
7	73
8	82
9	89
10	98

Enter the Roll no you want to search using binary search: 12
Roll no 12 found at position 2

Enter the Roll no you want to search using fibonacci search: 98
Roll no 98 found at position 10

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