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Class: BCSE II Sem:First
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Assignment Set: 1 **Problem No.** 3

Problem Statement: Write programs for linear search and binary search for searching integers, floating point numbers and words in arrays of respective types.

Solution Approach:

- Linear search – Traverse the array and look for the element
- Binary search – Traverse the sorted array , start from the middle, if middle element is bigger , search in the first half only. Thus continue. If found , return index, else return -1

Structured Pseudocode:

1. **Linear Search**

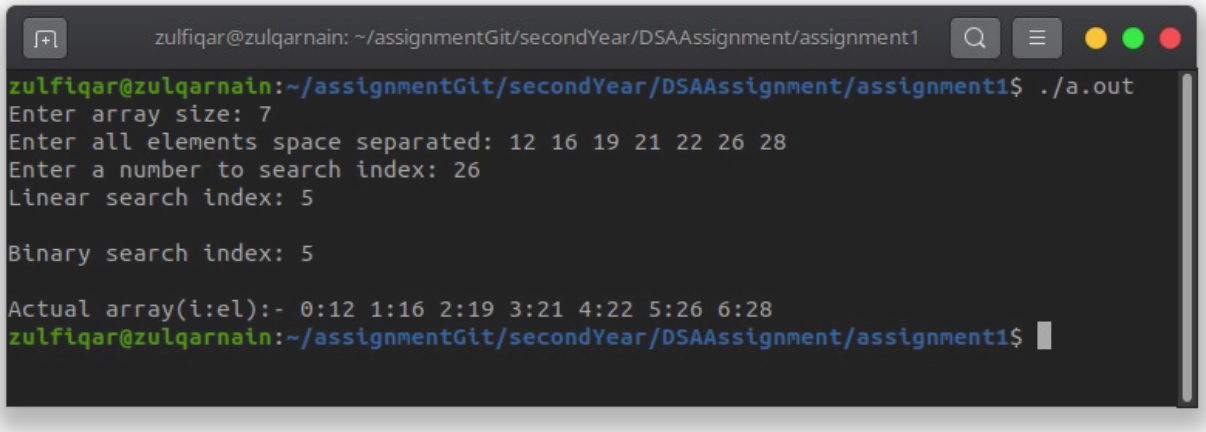
```
Read arr[n]
Read element
for i=1 to n :
   if(arr[i] == element):
      return i
return -1
```

2. **Binary Search**

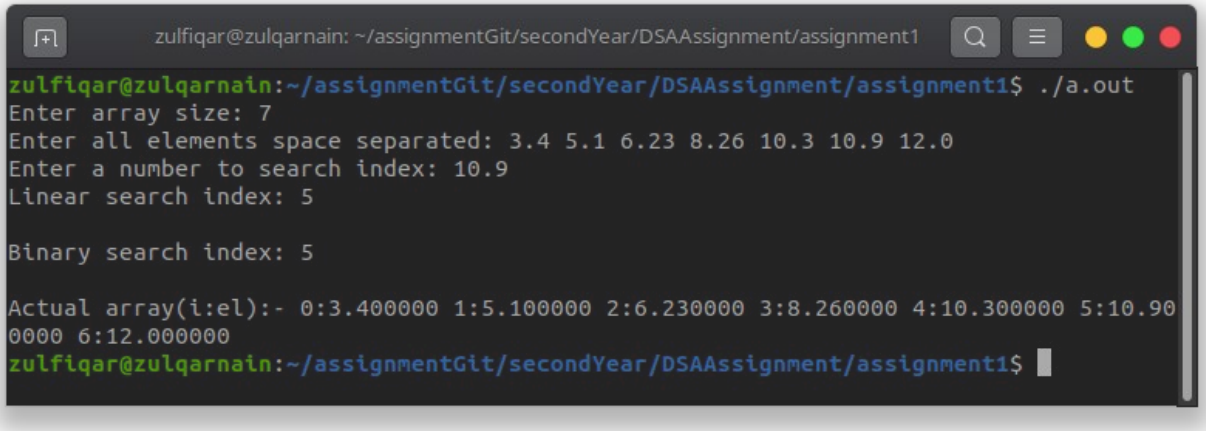
```
Read arr[n]
Read element
lower_bound = 1
higher_bound = n
while element not found:
        if(lower_bound > higher_bound)
           print " element does not exist"
           exit program

        middle = (lower_bound + higher_bound)/2
        if arr[middle] == element
           print "Element Found"
           exit program
        else if arr[middle] > element
           higher_bound = middle
        else
           lower_bound = middle
        end if
end while
end program
```

Results:

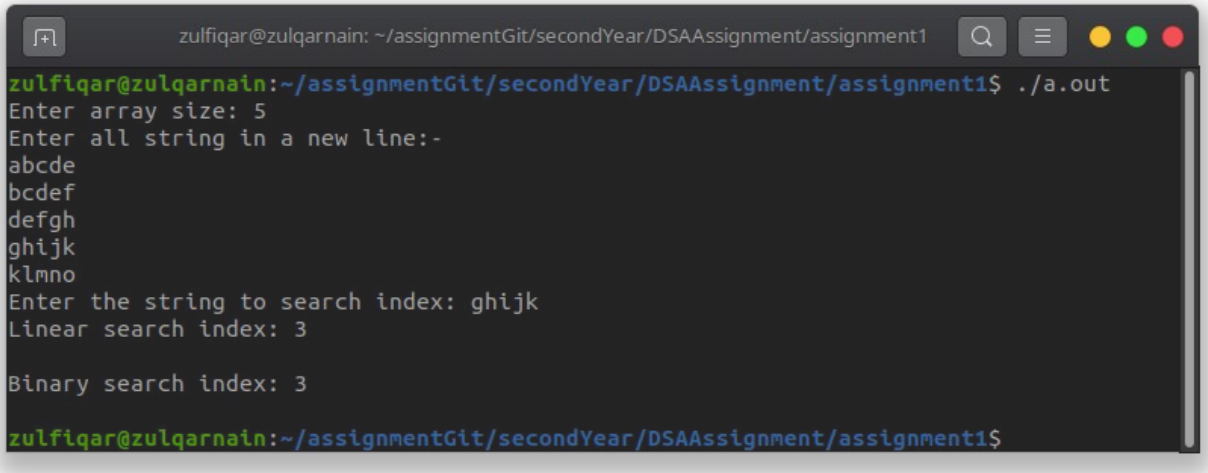
output1: For integer



output2: For float



output3: For string



Discussion
Code is implemented following the psueodo code.
Separate function are defined to check equality of two strings.

Separate files containing commented source code: Two source code are attached,:
assaignment3-a.c :- It implements binary and linear search for Integer.

assaignment3-b.c :- It implements binary and linear search for Floats.
assaignment3-c.c :- It implements binary and linear search for String.