/**********************************ASSIGNMENT1***
Write a menu based program
a)Write a program to strore roll number of student in array who attanded a trining program in random order. write a function for searching whether a particular student attended a training program or not , using linear search.

b)Write a program to store roll number of student in array who attended a training program in random order.write a function for searchng whether a particular student attended a training program or not , using binary search.

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***/

```
#include <stdio.h>

// Function for Linear Search
int linearsearch(int arr[], int size, int key)
{
  for (int i = 0; i < size; i++)
  {
     if (arr[i] == key)
        return i;  // found match
  }
  return -1;  // not found match
}

// Function for  Binary Search
int binarysearch(int arr[], int size, int key)
{
  int low = 0, high = size - 1;

  while (low <= high)
  {
     int mid = (low + high) / 2;

     if (arr[mid] == key)
        return mid;  // Element found at index mid
     else if (arr[mid] < key)
        low = mid + 1;  // Search in right half
     else
```

```
        high = mid - 1;  // Search in left half
  }
  return -1;  // Element not found
}


// Function to sort the array for binary search
void sortarray(int arr[], int size)
{
  for (int i = 0; i < size ; i++)
  {
     for (int j = i + 1; j < size; j++)
     {
        if (arr[i] > arr[j])
        {
           // Swap elements
           int temp = arr[i];
           arr[i] = arr[j];
           arr[j] = temp;
        }
     }
  }
}


//  to print the array
void printarray(int arr[], int size)
{
  for (int i = 0; i < size; i++)
     printf("%d ", arr[i]);
  printf("\n");
}


// Main Function
int main()
{
  int arr[100], size, choice, key, result;


  // Input number of students
  printf("Enter the number of students: ");
  scanf("%d", &size);


  // Input the  roll numbers
  printf("Enter roll numbers (unsorted):\n");
  for (int i = 0; i < size; i++) {
     printf("Roll number %d: ", i + 1);
     scanf("%d", &arr[i]);
}
```

```
  // Menu-driven based  program
  do {
     printf("\n--- Menu ---\n");
     printf("1. Linear Search\n");
     printf("2. Binary Search\n");
     printf("3. Exit\n");
     printf("Enter your choice: ");
     scanf("%d", &choice);


     switch (choice)
     {
        case 1:  // Linear Search
           printf("Enter the roll number to search: ");
           scanf("%d", &key);
           result = linearsearch(arr, size, key);
           if (result != -1)
              printf("Roll number %d  is attendeding the training program.\n", key);
           else
              printf("Roll number %d is not attending the training program.\n", key);
           break;


        case 2:  // Binary Search
           sortarray(arr, size);  // Sort before binary search
           printf("Sorted roll numbers: ");
           printarray(arr, size);
           printf("Enter the roll number to search: ");
           scanf("%d", &key);
           result = binarysearch(arr, size, key);
           if (result != -1)
              printf("Roll number %d attending the training program.\n", key);
           else
              printf("Roll number %d is not attending the training program.\n", key);
           break;


        case 3:  // Exit
           printf("Exiting program.\n");
           break;


        default:
           printf("Invalid choice. Please try again.\n");
     }


  } while (choice != 3);  // Repeat until user chooses to exit


  return 0;
}
```

/**OUTPUT***
student@student-OptiPlex-3000:~$ ./Tanishq
Enter the number of students: 5
Enter roll numbers (unsorted):
Roll number 1: 11
Roll number 2: 12
Roll number 3: 13
Roll number 4: 14
Roll number 5: 15

--- Menu ---
1. Linear Search
2. Binary Search
3. Exit
Enter your choice: 1
Enter the roll number to search: 14
Roll number 14 is attendeding the training program.

--- Menu ---
1. Linear Search
2. Binary Search
3. Exit
Enter your choice: 2
Sorted roll numbers: 11 12 13 14 15
Enter the roll number to search: 14
Roll number 14 attending the training program.

--- Menu ---
1. Linear Search
2. Binary Search
3. Exit
Enter your choice: 3
Exiting program.
student@student-OptiPlex-3000:~$ ./Tanishq
Enter the number of students: 5
Enter roll numbers (unsorted):
Roll number 1: 11
Roll number 2: 12
Roll number 3: 13
Roll number 4: 14
Roll number 5: 15

--- Menu ---
1. Linear Search
2. Binary Search
3. Exit
Enter your choice: 1
Enter the roll number to search: 11
Roll number 11 is attendeding the training program.

--- Menu ---
1. Linear Search
2. Binary Search
3. Exit
Enter your choice: 1
Enter the roll number to search: 16
Roll number 16 is not attending the training program.

--- Menu ---
1. Linear Search
2. Binary Search
3. Exit
Enter your choice: 2
Sorted roll numbers: 11 12 13 14 15
Enter the roll number to search: 13
Roll number 13 attending the training program.

--- Menu ---
1. Linear Search
2. Binary Search
3. Exit
Enter your choice: 2
Sorted roll numbers: 11 12 13 14 15
Enter the roll number to search: 18
Roll number 18 is not attending the training program.

--- Menu ---
1. Linear Search
2. Binary Search
3. Exit
Enter your choice: 3
Exiting program.
student@student-OptiPlex-3000:~$

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