AGNIM GUPTA
2028083
DSA LAB

Q1

3rd semister > DSA lab > class 1 > C class1_q1.c > main()

```c
#include <stdio.h>

int main(){
    int i;
    char c;
    double f;
    float t;
    printf("Size of int: %d bytes\n", sizeof(i));
    printf("Size of float: %f bytes\n", sizeof(c));
    printf("Size of char: %c bytes\n", sizeof(f));
    printf("Size of double: %lf bytes\n", sizeof(t));

}
```

OUTPUT

```
PS C:\Users\KIIT\Documents\coding\3rd semister\DSA
 lab\class 1> cd "c:\Users\KIIT\Documents\coding\3
rd semister\DSA lab\class 1\" ; if ($?) { gcc clas
s1_q1.c -o class1_q1 } ; if ($?) { .\class1_q1 }
Size of int: 4 bytes
Size of float: 0.000000 bytes
Size of char: bytes
Size of double: 0.000000 bytes
PS C:\Users\KIIT\Documents\coding\3rd semister\DSA
 lab\class 1>
```

Q2

3rd semister > DSA lab > class 1 > C class1_q2.c > main()

```c
#include <stdio.h>

int main()
{
    int arr[10]={23, 53, 12, 33, 23, 29, 17, 47, 63, 20};
    int size=10, i,max, min;
    max = arr[0];
    for(i = 1; i < size; i++){
        if(max < arr[i])
        max= arr[i];
    }
    printf("The largest element is: %d\n", max);
    min = arr[0];
    for(i = 1; i < size; i++){
        if(min>arr[i])
        min= arr[i];
    }
    printf("The smallest element is: %d", min);
}
```

OUTPUT

```
PS C:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1> c
d "c:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1\"
; if ($?) { gcc class1_q2.c -o class1_q2 } ; if ($?) { .\class1_q
2 }
The largest element is: 63
The smallest element is: 12
PS C:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1>
```

Q3

3rd semister > DSA lab > class 1 > C class1_q3.c > main()

```c
#include<stdio.h>

int main()
{
    int i, n, lar,sm, elem;
    printf ("Enter number of elements in array: ");
    scanf ("%d", &elem);
    printf ("Enter elements in array: ");
    scanf ("%d", &n);
    lar = n;
    sm=n;
    for (i=1; i<= elem -1 ; i++)
    {
        //printf ("Enter another number:");
        scanf ("%d",&n);
        if (n>lar)
        lar=n;
        if (n<sm)
        sm=n;
    }
    printf ("The largest number is %d\n", lar);
    printf ("The smallest number is %d", sm);
    return 0;
}
```

OUTPUT

```
PS C:\Users\KIIT\Documents\coding\3rd semister\DSA lab\cl> cd "c:\Users\KIIT\Documents\
coding\3rd semister\DSA lab\class 1\" ; if ($?) { gcc class1_q3.c -o class1_q3 } ; if (
$?) { .\class1_q3 }
Enter number of elements in array: 5
Enter elements in array: 34
23
53
78
34
The largest number is 78
The smallest number is 23
PS C:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1>
```

Q4

3rd semister > DSA lab > class 1 > class1_q4.c > main()

```c
#include <stdio.h>
#include <stdlib.h>

int main(){
      int *p,n,i;
      printf("How many numbers you want to enter: ");
      scanf("%d",&n);
      p=(int*)malloc(n * sizeof(int));
      printf("Enter %d Numbers:",n);
      for(i=0;i<n;i++)
      {
            scanf("%d",p+i);
      }
      printf("Array in Reverse Order: ");
      for(i=n-1;i>=0;i--)
      {
            printf(" %d",*(p+i));
      }
      return 0;
}
```

OUTPUT

```
PS C:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1> cd "c:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1\" ; if ($?) { gcc class1_q4.c -o class1_q4 } ; if ($?) { .\class1_q4 }
How many numbers you want to enter: 5
Enter 5 Numbers:23
45
23
87
34
Array in Reverse Order:  34 87 23 45 23
PS C:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1>
```

Q5A

3rd semister > DSA lab > class 1 > C class1_q5a.c > main()

```c
#include <stdio.h>

int main()
{
    int i, arr[10], search, first, last, middle;
    printf("Enter 10 elements (in ascending order): ");
    for(i=0; i<10; i++)
    {
        scanf("%d", &arr[i]);
    }
    printf("\nEnter element to be search: ");
    scanf("%d", &search);
    first = 0;
    last = 9;
    middle = (first+last)/2;
    while(first <= last)
    {
        if(arr[middle]<search)
        {
            first = middle+1;
        }
        else if(arr[middle]==search)
        {
            printf("\nThe number, %d found at Position %d", search, middle+1);
            break;
        }
        else
            last = middle-1;
        middle = (first+last)/2;
    }
    if(first>last)
        printf("\nThe number, %d is not found in given Array", search);
    return 0;
}
```

OUTPUT

```
PS C:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1> cd "
c:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1\" ; if (
$?) { gcc class1_q5a.c -o class1_q5a } ; if ($?) { .\class1_q5a }
Enter 10 elements (in ascending order): 21
22
23
24
25
26
27
28
29
30

Enter element to be search: 25

The number, 25 found at Position 5
PS C:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1>
```

Q5B

3rd semister > DSA lab > class 1 > class1_q5b.c > main(void)

```c
#include <stdio.h>
#include <math.h>
#include <stdlib.h>
#define MAX_SIZE 101
#define SWAP(x,y,t) ((t) = (x), (x) = (y), (y) = (t))
void sort(int [],int);
void main(void)
{
    int i,n, search;
    int list[MAX_SIZE];
    printf("Enter the number of numbers to generate: ");
    scanf("%d",&n);
    if(n<1 || n > MAX_SIZE){
        printf("Improper value of n\n");
    }
    for(i=0; i<n; i++){
        list[i] = rand() % 1000;
        printf("%d ",list[i]);
    }
    sort(list,n);
    printf("\nSorted array: \n");
    for(i=0;i<n;i++)
    {
    printf("%d ",list[i]);
    }
    printf("\n");
    printf("enter number to be searched: \n");
    scanf("%d", &search);
    for(i=0;i<n;i++)
    {
        if(list[i]==search)
        {
            printf("number found at %d:", i+1);
        }
    }
}
void sort(int list[],int n)
{
 int i,j,min,temp;
 for(i=0;i<n-1;i++)
 {
  min = i;
  for(j = i+1;j<n;j++)
  if(list[j] < list[min]){
   min = j;
  }
  SWAP(list[i],list[min],temp);
  }
 }
```

OUTPUT

```
PS C:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1> cd "c:\Users\KIIT\Documents
\coding\3rd semister\DSA lab\class 1\" ; if ($?) { gcc class1_q5b.c -o class1_q5b } ; if ($
?) { .\class1_q5b }
Enter the number of numbers to generate: 5
41 467 334 500 169
Sorted array:
41 169 334 467 500
enter number to be searched:
169
number found at 2:
PS C:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1>
```

Q6

3rd semister > DSA lab > class 1 > class1_q6.c > sort(int [], int)

```c
#include <stdio.h>

void sort(int arr[], int n){
    int i, j;
    for (i = 0; i < n-1; i++){
        for (j = 0; j < n-i-1; j++){
            if (arr[j] > arr[j+1]){
                int temp = arr[j];
                arr[j] = arr[j+1];
                arr[j+1] = temp;
            }
        }
    }
}

int main(){
    int n,i;
    printf("Enter the number of elements : ");
    scanf("%d",&n);
    int arr[n];
    printf("Input the array elements : ");
    for(i = 0; i < n; i++){
        scanf("%d",&arr[i]);
    }
    sort(arr, n);
    printf("The second smallest element is %d \n",arr[1]);
    printf("The second largest element is %d ",arr[n-2]);
    return 0;
}
```

OUTPUT

```
PS C:\Users\KIIT\Documen> cd "c:\Users\KIIT\Documents\coding\3rd sem
ister\DSA lab\class 1\" ; if ($?) { gcc class1_q6.c -o class1_q6 } ;
 if ($?) { .\class1_q6 }
Enter the number of elements : 5
Input the array elements : 23
42
56
78
23
The second smallest element is 23
The second largest element is 56
PS C:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1>
```

Q7

3rd semister > DSA lab > class 1 > C class1_q7.c > main()

```c
#include <stdio.h>

int main()
{
    int n, i, a, b, c=0, d=2;
    printf("enter size of array:");
    scanf("%d", &n);
    printf("enter value of array:");
    int arr[n];
    for(i=0;i<n;i++)
    {
        scanf("%d", &arr[i]);
    }
    printf("\n enter lowest and highest value");
    scanf("%d %d", &a, &b);
    for(i=0;i<n;i++)
    {
        if(arr[i]==a || arr[i]==b)
        {
            c++;
            d=0;
        }
        if(arr[i]>a && arr[i]<b)
        {
            c++;
        }
    }
    printf("Number of elements in between two elements (Inclusive) = %d",c+d);
}
```

OUTPUT

```
PS C:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1> cd "c:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1\" ; if ($?) { gcc class1_q7.c -o class1_q7 } ; if ($?) { .\class1_q7 }
enter size of array:5
enter value of array:1
2
3
4
5

 enter lowest and highest value2
5
Number of elements in between two elements (Inclusive) = 4
PS C:\Users\KIIT\Documents\coding\3rd semister\DSA lab\class 1>
```

Ln 29, Col 2 Spaces: 4 UTF-8 CRLF C Win32