

VASAVI COLLEGE OF ENGINEERING

(AUTONOMOUS)

(Affiliated to Osmania University)

Hyderabad - 500031

DEPARTMENT OF CSE

NAME OF LABORATORY PPS LAB

86

Name: K. SREE INDIRA SIVANI Roll No: 1602-21-733-D5 Page No:

PRELAB QUESTIONS-7:

1) How do you pass a 1D array to the function?

A: We can pass an array to a function by:

```
void array(a[], #include <stdio.h>
void array(int a[], int size);
int main()
{
    int rno[5];
    array(rno, 5);
    return 0;
}.
```

void array(int a[], int size)

```
{ int i;
for(i=0; i<5; i++)
{ printf("%d", a[i]);
}
}.
```

2) Give the syntax for declaration of an array:

A: Syntax: datatype arrayname[size];

Eg: double cgpa[5];

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DEPARTMENT OF CSE

NAME OF LABORATORY PPSLAB

Name: K SREE INDRA SIVANI Roll No: 1602-21-733-052 Page No: 87

3) How do you initialize an 1D array?

A: datatype arrayname [size] = {a, b, c....., size terms};
e.g: int rollno[4] = {25, 27, 12, 40};

4) Define searching:

A: Searching is the process used to find the location of a target among a list of subjects.

In an array; searching means that given a value; we want to find the location of the first element in the array that contains that value.

5) Explain binary search mechanism with an example:

A: When a given array is sorted; we use an efficient algorithm called binary search which starts with searching for a middle term of the array; with which we could decide if the given element to search is in first half or second half. If it is in 1st half; there is no need to check 2nd half and vice versa. We repeat this process until we find the target element.

e.g: void binarySearch(int list[], int end, int target, int locn)

```
{ int first=0;  
  int mid;  
  int last = end;
```

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DEPARTMENT OF

CSE

NAME OF THE LABORATORY

PPS LAB

Name

K SREE INDIRASIVANI

Roll No. 1602-21-733-052

Page No

88

```
while(first <= last)
{ mid = (first+last)/2;
if(target > list[mid])
    first = mid + 1;
else if(target < list[mid])
    last = mid - 1;
else
    first = last + 1;
}
locn = mid;
return target == list[mid];
}.
```

6) Compare linear and binary search:

Linear Search	Binary search
1) It is used when the order of list is not specific.	1) It is used when the order of the list is sorted.
2) It is used for small lists.	2) It is used for lists containing more than 50 elements.
3) This search starts from beginning & continues till we find target.	3) This search begins from mid term & continues further.

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DEPARTMENT OF CSE

NAME OF LABORATORY PPS LAB

Name: K. SREE INDIRA SIVANI Roll No: 1602-21-733-D52 Page No: 89

7) Compare different storage classes in C:

A:

Storage Classes	Storage Value	Default value	Scope	Life-time
auto	RAM	Garbage value	Local	Within function
extern	RAM	0	Global	Till end of main program
static	RAM	0	local	Till end of main program, retains value between multiple calls
register	Register	Garbage value	local	Within function

8) Define array:

A: An array is a datastructure which is a collection of elements of same data-type.

PRELAB PROGRAMS: 7

1) Program to count the no. of duplicate elements in the array:

```
#include <stdio.h>
void duplicate(int d[], int s, int k);
int main()
{ int n,i;
  int origin[10];
  printf("Enter the number of terms: ");
```

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DEPARTMENT OF CSE

NAME OF LABORATORY PPS LAB

Name: K.SREE INDIRA SIVANI Roll No: 1602-21-733-052 Page No: 90

```
scanf ("%d", &n);
printf ("Enter the %d terms\n", n);
for (i=0; i<n; i++)
{
    scanf ("%d", &origin[i]);
}
duplicate (origin, n, i);
return 0;
}

void duplicate (int d[], int s, int k)
{
    int j, count=0;
    for(k=0; k<s; k++)
    {
        for(j=k+1; j<s; j++)
        {
            if (d[k] == d[j])
            {
                count++;
                break;
            }
        }
    }
    printf ("No. of duplicate terms = %d", count);
}
```

→ OUTPUT:

Enter the number
of terms: 6

Enter the 6 terms

10

16

8

8

10

15

No. of duplicate
terms = 2.

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DEPARTMENT OF CSE

NAME OF LABORATORY PPSLAB

Name: K SREE INDIRA SIVANI Roll No: 1602-21-733-052 Page No: 91

2) Program to put even and odd elements of array in 2 separate arrays.

```
#include <stdio.h>
void array(int t[], int e, int o, int s);
int main()
{ int s, e=0, o=0;
  int t[15];
  printf("Enter the number of terms: ");
  scanf("%d", &s);
  printf("Enter the terms: \n");
  for(i=0; i<s; i++)
  { scanf("%d", &t[i]);
    (t[i] % 2 == 0) ? e++ : o++;
  }
  array(t, e, o, s);
  return 0;
}
```

```
void array(int t[], int e, int o, int s)
{ int even[10];
  int odd[10];
  int i, j, k;
  for(i=0, j=0, k=0; i<s; i++)
  { if(t[i] % 2 == 0)
      even[j] = t[i];
    else
      odd[k] = t[i];
    j++;
    k++;
  }
```

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DEPARTMENT OF CSE

NAME OF LABORATORY PPS LAB

Name: K SREE INDIRA SIVANI Roll No: 1602-21-733-052 Page No: 92

```
{ if((t[i] % 2 == 0))  
{ even[j] = t[i];  
j++; }  
else  
{ odd[k] = t[i];  
k++; }  
}  
printf("Even numbers: ");  
for(i=0; i<e; i++)  
{ printf("%d,", even[i]);}  
{ printf(" Odd numbers: ");  
for(i=0; i<o; i++)  
{ printf("%d,", odd[i]);}  
}
```

→ OUTPUT:

Enter the number of terms: 5

Enter the terms

10
14
25
16
27

Even numbers: 10,14,16

Odd numbers: 25,27,

- 3) Program to insert a particular element in a specified position in a given array.

```
#include <stdio.h>  
void insert(int a[], int s);  
int main()
```

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DEPARTMENT OF CSE

NAME OF LABORATORY PPS LAB

Name: K SREE INDIRA SIVANI Roll No: 1602-21-733-052 Page No: 93

```
int i, n, r, k;
int array[20];
printf("Enter the number of terms:");
scanf("%d", &n);
printf("Enter the terms:\n");
for(i=0; i<n; i++)
{
    scanf("%d", &array[i]);
}
insert(array, n);
printf("New array:\n");
for(i=0; i<n; i++)
{
    printf("%d, ", array[i]);
}
return 0;
}

void insert(int a[], int s)
{
    int r, k;
    printf("Enter the index:");
    scanf("%d", &k);
    printf("Enter the term to be printed:");
    scanf("%d", &r);
    if (k>=0 && k<=s-1)
    {
        a[k] = r;
    }
}
```

→ OUTPUT:

Enter the number of
terms: 5

Enter the terms:

12

14

19

28

38

Enter the index: 2

Enter the term to be
printed: 25

New array:

12, 14, 25, 28, 38.

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DEPARTMENT OF CSE

NAME OF LABORATORY PPSLAB.

94

Name: 1602-K-SREE INDIRA SIVANI Roll No: 1602-21-733-052 Page No:

→ AIM: Program to illustrate arrays.
PRINT MINIMUM AND MAXIMUM CGPA:

→ PROBLEM STATEMENT: Write a program to read the CGPA of the students in a class and print the minimum and maximum CGPA.

→ PROGRAM:

```
#include <stdio.h>
int main()
{
    int num,i;
    float max,min;
    printf("Enter the class strength : ");
    scanf("%d", &num);
    float cgpa[10];
    for(i=0; i<num; i++)
    {
        printf("Enter the cgpa: ");
        scanf("\n%f", &cgpa[i]);
    }
    max = min = cgpa[0];
    for(i=1; i<num; i++)
    {
        max = max > cgpa[i] ? max : cgpa[i];
        min = min < cgpa[i] ? min : cgpa[i];
    }
    printf("maximum cgpa=%f\n", max);
    printf("minimum cgpa=%f\n", min);
    return 0;
}
```

→ OUTPUT:

Enter the class strength : 5

Enter the CGPA : 10

Enter the CGPA : 2

Enter the CGPA : 5

Enter the CGPA : 3

Enter the CGPA : 8

maximum cgpa = 10.000000

minimum cgpa = 2.000000

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(AUTONOMOUS)

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Hyderabad - 500031

DEPARTMENT OF CSE

NAME OF LABORATORY PPS LAB

Name: K. SREE INDIRA SIVANI Roll No: 1602-21-733-052 Page No: 95

→ AIM: Program to illustrate the use of array.

PRINT THE TOTAL MARKS AND PERCENTAGE

→ PROBLEM STATEMENT: Write a program to read the number of subjects and internal 1 marks scored in all the subjects. Calculate the total marks and calculate the percentage.

→ PROGRAM:

```
#include <stdio.h>
int main()
{ int i,n;
float sum=0,percentage;
float marks[10];
printf("Enter the number of subjects : ");
scanf("%d", &n);
for(i=0; i<n; i++)
{
    printf("Enter the subject marks out of 30 : ");
    scanf("%f", &marks[i]);
    sum+=marks[i];
}
printf("sum=%f\n", sum);
percentage = (sum*100)/(n*30);
printf("percentage = %.0f, percentage");
return 0; }
```

→ OUTPUT:

Enter the number of subjects : 5

Enter the subject marks out of 30 : 26

Enter the subject marks out of 30 : 25

Enter the subject marks out of 30 : 30

Enter the subject marks out of 30 : 29

Enter the subject marks out of 30 : 21

Sum = 131.000000

percentage = 87.333

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DEPARTMENT OF CSE

NAME OF LABORATORY PPS LAB

Name: K'SREE INDIRA SIVANI Roll No: 1602-21-733-052 Page No:

96

→ AIM: Program to illustrate linear search.

PROGRAM ON LINEAR SEARCH

→ PROBLEM STATEMENT: Write a program to store the roll numbers of students participating in college fest.

Given a roll number; check whether the student is participating in the fest or not.

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

```
int search(int a[], int s, int c)
{ int i;
  for(i=0; i<s; i++)
  { if(a[i] == c)
    return i;
  return -1;
}
```

```
int main()
{ int n, i, c, r;
  int part[20];
```

```
printf("Enter the number of students:");
scanf("%d", &n);
```

```
for(i=0; i<n; i++)
{
```

```
  printf("Enter the roll numbers:");
  scanf("%d", &part[i]);
}
```

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(AUTONOMOUS)

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Hyderabad - 500031

DEPARTMENT OF CSE

NAME OF LABORATORY PPS LAB

Name: K.SREE INDIRA SIVANI Roll No: 1602-21-733-052 Page No:

97

```
printf("Enter the roll number of student to be verified:");
scanf("%d",&c);
r=search(part,n,c);
if(r== -1)
{ printf("%d is not participating in the fest",c);
}
else
{ printf("%d is participating in the fest",c);
}
return 0;
}.
```

→ OUTPUT:

- 1) Enter the number of students : 5
Enter the roll number : 29
Enter the roll number : 21
Enter the roll number : 33
Enter the roll number : 41
Enter the roll number : 58
Enter the roll number of the student to be verified : 52
52 is not participating in the fest.

- 2) Enter the number of students : 4
Enter the roll number : 26
Enter the roll number : 51
Enter the roll number : 23
Enter the roll number : 15
Enter the roll number of the student to be verified : 23
23 is participating in the fest.

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DEPARTMENT OF CSE

NAME OF LABORATORY PPS LAB

Name: K.SREE INDIRA SIVANI Roll No: 1602-21-733-D52 Page No: 98

→ AIM: Program to illustrate linear search with recursion.
PROGRAM ON LINEAR SEARCH WITH RECURSION:

→ PROBLEM STATEMENT: Write a program to find out whether the given roll no. student is participating in the fest or not with recursive linear search function.

→ PROGRAM:

```
#include <stdio.h>
int search(int a[], int s, int c)
{
    int i;
    if (s == 0)
        for { printf("%d is not participating in the fest\n", c);
               return; }

    if (a[s] == c)
        { printf("%d is participating in the fest\n", c);
          return; }
    search(a, s-1, c);
}

int main()
{
    int n, i, c;
    int arr[20];
    printf("Enter the number of students :");
```

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(AUTONOMOUS)

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DEPARTMENT OF CSE

NAME OF LABORATORY PPS LAB.

Name: K.SREE INDIRA SIVANI Roll No: 1602-21-733-052 Page No: 99

```
scanf("%d", &part[i]);
scanf("%d", &n);
for(i=0;i<n;i++)
{
    printf("Enter the roll numbers:");
    scanf("%d", &part[i]);
}
printf("Enter the roll number of student to be verified:");
scanf("%d", &c);
Search(part, n, c);
return 0;
}
```

→ OUTPUT:

1) Enter the number of students : 5

Enter the roll numbers : 26

Enter the roll numbers : 51

Enter the roll numbers : 8

Enter the roll numbers : 14

Enter the roll number : 66

Enter the roll number of the student to be verified : 53

53 is not participating in the fest.

2) Enter the number of students : 4

Enter the roll number : 12

Enter the roll number : 8

Enter the roll number : 45

Enter the roll number : 52

Enter the roll number of student to be verified : 45

45 is participating in the fest.

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DEPARTMENT OF CSE

NAME OF LABORATORY PPS LAB

Name: K.SREEINDIRA SIVANI Roll No: 1602-21-733-052 Page No: 100

→ AIM: Program to illustrate the use of binary search.

PROGRAM ON BINARY SEARCH:

→ PROBLEM STATEMENT: Write a program to store the roll numbers of the students absent for PPS class. Given a roll no. check whether the student is present or absent using binary search.

→ PROGRAM:

```
#include <stdio.h>
int binarysearch(int a[], int s, int c).
{
    int mid;
    int l=0;
    int h = s-1;
    while(l<=h)
    {
        mid = (l+h)/2;
        if(c==a[mid])
        {
            printf("Student is absent");
            return mid;
        }
        else if(c<a[mid])
        {
            h = mid-1;
        }
        else
        {
            l = mid+1;
        }
    }
}
```

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(AUTONOMOUS)

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Hyderabad - 500031

DEPARTMENT OF CSE

NAME OF LABORATORY PPS LAB

Name: K SREE INDIRA SIVANI Roll No: 1602-21-733-052 Page No: 101

```
return -1; }  
int main()  
{ int i, c, r, n;  
int sorted[10];  
printf("Enter the number of students absent for  
PPS class:");  
scanf("%d", &n);  
for(i=0; i<n; i++)  
{ printf("Enter the roll number:");  
scanf("%d", &sorted[i]);  
}  
printf("Enter the roll number to be checked:");  
scanf("%d", &c);  
r = binarysearch(sorted, n, c);  
if(r == -1)  
{ printf("Student is present");  
}  
return 0;  
}
```

→ OUTPUT:

1) Enter the number of students absent for PPS class: 5

Enter the roll number: 4

Enter the roll number: 12

Enter the roll number: 18

Enter the roll number: 29

Enter the roll number: 30

Enter the roll number to be checked: 54

Student is present.

2) Enter the number of students absent for PPS class: 4

Enter the roll number: 12

Enter the roll number: 16

Enter the roll number: 39

Enter the roll number: 66.

Enter the roll number to be checked: 66.

Student is absent.

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(AUTONOMOUS)

(Affiliated to Osmania University)

Hyderabad - 500031

DEPARTMENT OF CSE

NAME OF LABORATORY PPS LAB

Name: K · SREE INDIRA SIVANI Roll No: 1602-21-733-052 Page No: 102

→ AIM: Program to illustrate binary search with recursion.

PROGRAM ON BINARY SEARCH WITH RECURSION:

→ PROBLEM STATEMENT: Write a program to store the roll numbers of the students absent for PPS class. Given a roll no. check whether the given roll no. is present or absent with recursive binary search function.

→ PROGRAM:

```
# include <stdio.h>
void binarysearch(int a[], int l, int h, int c);
int main()
{
    int i, n;
    int sorted[10];
    printf("Enter the number of students absent for PPS class:");
    scanf("%d", &n);
    for (i = 0; i < n; i++)
    {
        printf("Enter the roll number:");
        scanf("%d", &sorted[i]);
    }
    printf("Enter the roll number to be checked:");
    scanf("%d", &c);
    binarysearch(sorted, 0, n, c);
```

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(AUTONOMOUS)

(Affiliated to Osmania University)

Hyderabad - 500031

DEPARTMENT OF CSE

NAME OF LABORATORY PPS LAB

Name: K.SREE INDIRA SIVANI Roll No: 1602-21-733-052 Page No: 103

return 0;

}

void binarysearch(int a[], int l, int h, int c)

{

int mid;

mid = (l+h)/2;

if (a[mid] == c)

{

printf("Student is absent");

return;

}

if (l > h)

{

printf("Student is present");

return;

}

if (c < a[mid])

{ h = mid - 1;

binarysearch(a, l, mid-1, c);

}

if (c > a[mid]).

{ l = mid + 1;

binarysearch(a, mid+1, h, c); } }.

→ OUTPUT:

1) Enter the number of students absent for PPS class:4

Enter the roll number:12

Enter the roll number:16

Enter the roll number:19

Enter the roll number:27

Enter the roll number to be checked:55.

Student is present.

2) Enter the number of students absent for PPS class:5

Enter the roll number:1

Enter the roll number:6

Enter the roll number:19

Enter the roll number:28

Enter the roll number:33

Enter the roll number to be checked:33

Student is absent.