Practical-3

1. Write a program in C to implement arrays of pointers and pointers to arrays.

Aim:

To differentiate between the concept of array of pointers and pointer to array .

Theory:

In this practical we took an array of pointers and stored the address of the values entered by the user also we displayed them in the output using a single pointer to access other elements of the array.

Program/Code:

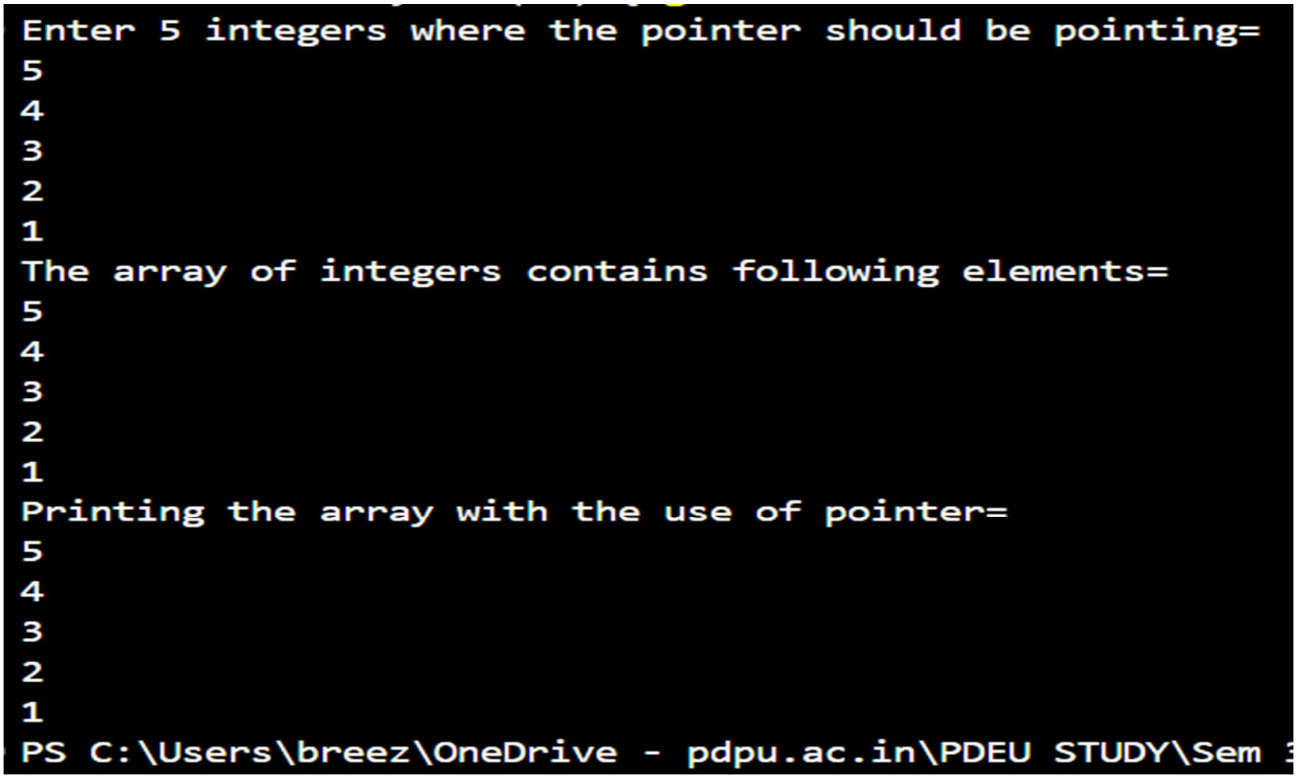
```
#include <stdio.h>


int main()
{
   // array of pointers
   int *p[5];
   int arr[5];
   printf("Enter 5 integers where the pointer should be pointing=\n");
   for (int i=0;i<5;i++)
   {
      scanf("%d",&arr[i]);
   }
   for(int i=0;i<5;i++)
   {
      p[i]=&arr[i];
   }
   printf("The array of integers contains following elements=\n");
   for (int i=0;i<5;i++)
   {
```

```
    printf("%d\n",*p[i]);
  }

  // pointer to array
  int *q=arr;
  printf("Printing the array with the use of pointer=");
  for (int i=0;i<5;i++)
  {
    printf("\n%d",*(q+i));
  }
}
```

Output:



Time Complexity:

O(1)

2. Write a program in C to implement pointers to structures.

Aim:

To showcase the implementation of the pointers in structure.

Theory:

In this practical we used pointer to point to the values stored in the address of struct by passing the address to the function and storing it to a pointer.

Program/Code:

```
#include <stdio.h>

struct student

{

   char student_name[100];

   int student_rollno;

   char student_address[100];

};


void print_info(struct student *s1)

{

   printf("Name of student is= %s \n",(*s1).student_name);

   printf("Roll no of student = %d \n",(*s1).student_rollno);

   printf("The address of student is = %s \n",(*s1).student_address);

}


void main()

{

   struct student s;

   printf("Enter the name of the student=\n");

   scanf("%s",s.student_name);

   printf("Enter the roll no of student=\n");

   scanf("%d",&s.student_rollno);
```

```
    printf("Enter the address of the student=\n");
    scanf("%s",s.student_address);
    print_info(&s);
}
```

Output:

```
Enter the name of the student=
Panav
Enter the roll no of student=
25
Enter the address of the student=
PDEU
Name of student is= Panav
Roll no of student = 25
The address of student is = PDEU
PS C:\Users\breez\OneDrive - pdpu.
```

Time Complexity:

O(n)

Link for all the code:

https://github.com/PanavPatel06/DSA-Lab/tree/main/Practise-3

3. Write a program in C to perform swapping of two numbers by passing addresses of the variables to the functions.

Aim:

To swap the integer using pointers.

Theory:

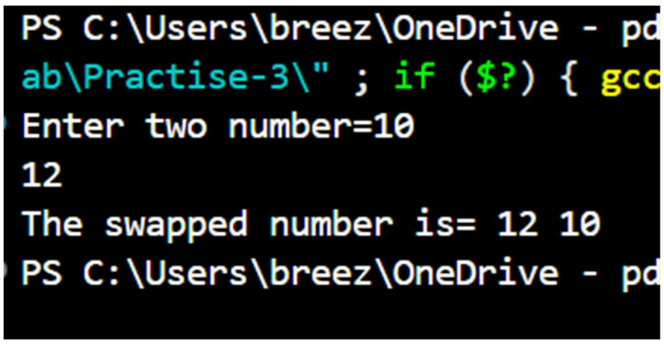
In this practical we swapped numbers using the address of it .

Program/Code:

```
#include<stdio.h>
int swap(int *a,int *b)
{
  int temp=*a;
  *a=*b;
  *b=temp;
  printf("The swapped number is= %d %d",*a,*b);
  return 0;
}

int main()
{
  int p,q;
  printf("Enter two number=");
  scanf("%d %d",&p,&q);
  swap(&p,&q);
  return 0;
}
```

Output:



Time Complexity:

O(n)