

## 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++)
```

```
    {
```

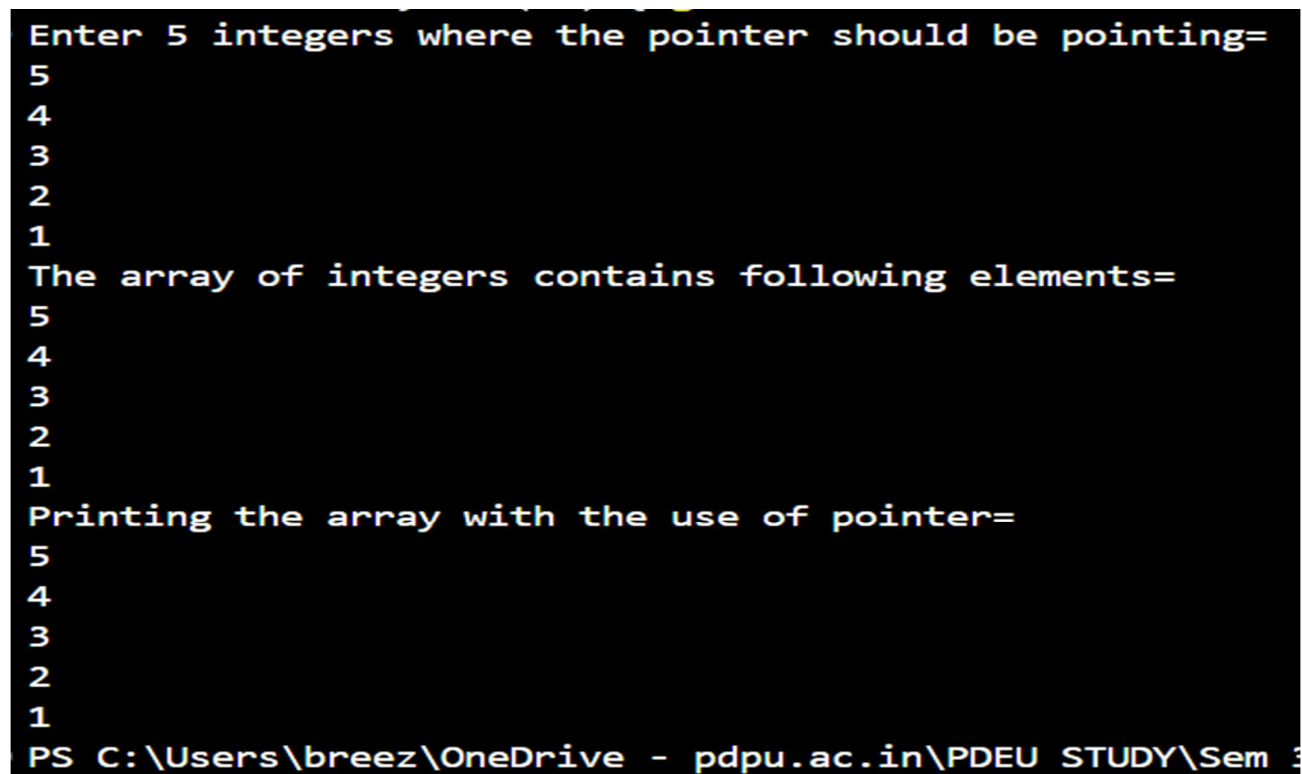
```

        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:



```

Enter 5 integers where the pointer should be pointing=
5
4
3
2
1
The array of integers contains following elements=
5
4
3
2
1
Printing the array with the use of pointer=
5
4
3
2
1
PS C:\Users\breez\OneDrive - pdpu.ac.in\PDEU STUDY\Sem 3

```

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>

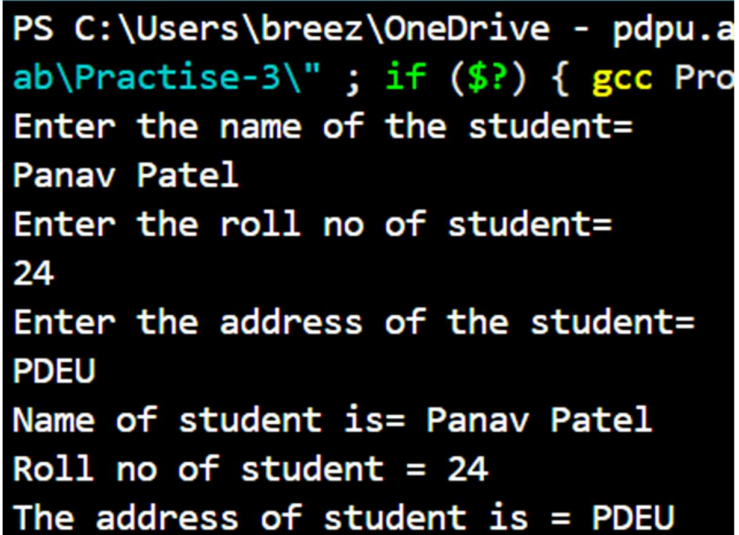
struct student
{
    char student_name[100];
    int student_rollno;
    char student_address[100];
};

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(" %[^\\n]",s.student_address);  
print_info(&s);  
}
```

Output:



```
PS C:\Users\breez\OneDrive - pdpu.aab\Practise-3\" ; if ($?) { gcc Pro  
Enter the name of the student=  
Panav Patel  
Enter the roll no of student=  
24  
Enter the address of the student=  
PDEU  
Name of student is= Panav Patel  
Roll no of student = 24  
The address of student is = PDEU
```

Time Complexity:

$O(n)$

### **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:

```
PS C:\Users\breez\OneDrive - pd
ab\Practise-3\" ; if ($?) { gcc
Enter two number=10
12
The swapped number is= 12 10
PS C:\Users\breez\OneDrive - pd
```

Time Complexity:

$O(n)$

Link for all the code:

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