EE4013 Assignment-1

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1 PROBLEM

Consider the following C program

```c
#include <stdio.h>
int main ()
{
        int arr[] = {1,2,3,4,5,6,7,8,9,0,1,2,5}, *ip
            = arr + 4;
        printf("%d\n",ip[1]);
        return 0;
}
```

The number that will be dispalyed on the execution of the program is :

2 SOLUTION

The output of the given C program is

6

Initially we defined an integer array by name *arr* of size 13.

int arr[] = {1,2,3,4,5,6,7,8,9,0,1,2,5};

An array in C or be it in any programming language is a collection of similar data items stored at contiguous memory locations and elements can be accessed randomly using indices of an array. They can be used to store collection of primitive data types such as int, float, double, char, etc of any particular type.
The created array will be created as shown in Fig.0

Given Array

Fig. 0: Given Input array

By default while creating an array, a pointer as the name of the array i.e., *arr* is created and it stores the address of the first element in the arr.
This is shown in below Fig.0
Then we initialized a pointer *ip* as

int *ip = arr + 4;

The above line of code creates a pointer such that it points to the 4th element from the element pointed by pointer *arr* i.e., the pointer *ip* stores the address of the element present in 5th index of array arr. This is pictured in Fig.0
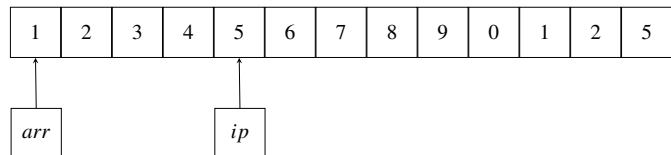

Fig. 0: Pointer pointing to an element in array

Now the final line of code is:

printf("%d\n",ip[1]);

Using this line of code we are printing the element present in *ip*[1]. The value of *ip*[1] i.e ($*(ip + 1)$) is equivalent to element present in memory address pointed by the pointer $ip + 1$.
The element pointed by pointer $ip + 1$ is shown in Fig. 0
So, now the above printf line prints the integer stored at the address, the pointer $ip + 1$ points in the terminal i.e., **6**.
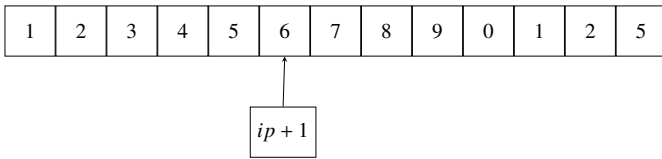
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 5 |

$ip + 1$

Fig. 0