

Indian Institute of Engineering Science and Technology, Shibpur

Information Technology

Programming Lab Assignment-3

23-09-2021

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2020ITB065-HY

```
/*Programming Lab Assignment-3 23-09-2021 Tathagata Ghosh 2020ITB065*/

/*Q1) Write a program in C to demonstrate how to swap the values of two variables using a function.
Write the function in two ways. One using a pass by value and another using a pass by reference.*/

#include<stdio.h>

void swap( int *a , int *b )
{
    *a = *a + *b ;
    *b = *a - *b ;
    *a = *a - *b ;
    return;
}

void swap1(int a, int b)
{
    int t=a;
    a=b;
    b=t;
    printf("After swapping by call by value:\n");
    printf("a=%d\nb=%d\n",a,b);
    return;
}

int main()
{
    int a , b ;
    printf("Enter 2 numbers : ");
    scanf("%d %d", &a , &b );
    int *aptr = &a ;
    int *bptr = &b ;
    printf("a=%d & b=%d before swapping.\n", *aptr , *bptr );
    int ch;
    do
    {
        printf("Enter your choice:\n 1.Swap (call by reference)\n 2.Swap (call by value)\n 3.Exit\n");
        scanf("%d",&ch);
```

```

switch(ch)
{
    case 1:swap( aptr , bptr );
        printf("After swapping by call by reference:\n");
        printf("a=%d\nb=%d\n",*aptr,*bptr);
        break;
    case 2:swap1(a,b);
        break;
    case 3: break;
    default: printf("---Invalid Input---\n");
        break;
}
} while (ch!=3);
return 0;
}

```

The screenshot shows a Visual Studio Code editor with a C program file named 'Swap_2.c'. The terminal window is open, showing the execution of the program. The user has entered '1' to select 'Swap (call by reference)'. The program outputs 'After swapping by call by reference: a=21 b=12'. The user has then entered '2' to select 'Swap (call by value)'. The program outputs 'After swapping by call by value: a=12 b=21'. The user has then entered '3' to select 'Exit'.

```

PS D:\C Programs> cd "d:\C Programs\" ; if ($?) { gcc Swap_2.c -o Swap_2 } ; if ($?) { .\Swap_2 }
Enter 2 numbers : 12 21
a=12 & b=21 before swapping.
Enter your choice:
1.Swap (call by reference)
2.Swap (call by value)
3.Exit
1
After swapping by call by reference:
a=21
b=12
Enter your choice:
1.Swap (call by reference)
2.Swap (call by value)
3.Exit
2
After swapping by call by value:
a=12
b=21
Enter your choice:
1.Swap (call by reference)
2.Swap (call by value)
3.Exit
3
PS D:\C Programs>

```

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/*Q2) Demonstrate using a C program how the pointer to an array and array of pointers work.*/

```

#include<stdio.h>
const int SIZE = 5;
int main()
{
    int *ptr;
    int b[5] = {10,20,30,40,50};
    ptr = &b;
    printf("Printing elements in an array using pointer to an array:\n");
    for (int i = 0; i < 5; i++)

```

```
{
    printf("b[%d]=%d\n",i, *(ptr + i));
}
printf("Printing elements of an array using array of pointers:\n");
int *a[5];
for (int i = 0; i < SIZE; i++)
{
    a[i] = &b[i];
}
for (int i = 0; i < SIZE; i++)
{
    printf(" b[%d] = %d\n", i, *a[i]);
}
return 0;
}
```

arr_pointer.c - C Programs - Visual Studio Code

PROBLEMS 12 OUTPUT DEBUG CONSOLE TERMINAL

Windows PowerShell
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Install the latest PowerShell for new features and improvements! <https://aka.ms/PSWindows>

PS D:\C Programs> cd "d:\C Programs\" ; if (\$?) { gcc Swap_2.c -o Swap_2 } ; if (\$?) { .\Swap_2 }

Enter 2 numbers : 12 21
a=12 & b=21 before swapping.
Enter your choice:
1.Swap (call by reference)
2.Swap (call by value)
b[0]=10
b[1]=20
b[2]=30
b[3]=40
b[4]=50
Printing elements of an array using array of pointers:
b[0] = 10
b[1] = 20
b[2] = 30
b[3] = 40
b[4] = 50
PS D:\C Programs>

Ln 23, Col 36 Spaces: 4 UTF-8 CRLF c 2 Spell Win32 23:38 23-09-2021