

Programming Fundamentals

Lab Report

Lab 08



Group Members Name & Reg #:	<u>Muhammad Haris Irfan</u> (FA18-BCE-090)
Class	Programming Fundamentals CSC103 (BCE-2B)
Instructor's Name	Dilshad Sabir

In Lab Tasks

Question no: 1

For the given program find (and print) the addresses assigned to all the variables against their names.

```
#include<stdio.h>
void test(void);

int m = 22, n = 44;
float a = 50.5, b = 8.79;

int main()
{
    int x, y=5, z = -5;
    test();
}

void test()
{
    char ch1 = 'F', ch2 = 69, ch3 = 100;
    int x = 5, y = 55, z = 8;
}
```

Solution:

The Code for the following code is attached below,

```

4   void test(void);
5
6   int m = 22, n = 44;
7   float a = 50.5, b = 8.79;
8
9   int main()
10  {
11      int x, y = 5, z = -5;
12      int *ptr1 = &x;
13      int *ptr2 = &y;
14      int *ptr3 = &z;
15
16      printf("The value of local variable x is %d at address %u\n\n", *ptr1, ptr1);
17      printf("The value of local variable y is %d at address %u\n\n", *ptr2, ptr2);
18      printf("The value of local variable z is %d at address %u\n\n", *ptr3, ptr3);
19      printf("The value of global variable m is %d at address %u\n\n", m, &m);
20      printf("The value of global variable n is %d at address %u\n\n", n, &n);
21      printf("The value of global variable a is %f at address %u\n\n", a, &a);
22      printf("The value of global variable b is %f at address %u\n\n", b, &b);
23      test();
24  }
25
26  void test()
27  {
28      char ch1 = 'F', ch2 = 69, ch3 = 100;
29      int x = 5, y = 55, z = 8;
30
31      printf("The value of local variable ch1 is %c at address %u\n\n", ch1, &ch1);
32      printf("The value of local variable ch2 is %c at address %u\n\n", ch2, &ch2);
33      printf("The value of local variable ch3 is %c at address %u\n\n", ch3, &ch3);
34      printf("The value of local variable x is %d at address %u\n\n", x, &x);
35      printf("The value of local variable y is %d at address %u\n\n", y, &y);
36      printf("The value of local variable z is %d at address %u\n\n", z, &z);
37  }

```

The Result of the following code is attached below:

```

The value of local variable x is 4201216 at address 6422304
The value of local variable y is 5 at address 6422300
The value of local variable z is -5 at address 6422296
The value of global variable m is 22 at address 4210692
The value of global variable n is 44 at address 4210696
The value of global variable a is 50.500000 at address 4210700
The value of global variable b is 8.790000 at address 4210704
The value of local variable ch1 is F at address 6422255
The value of local variable ch2 is E at address 6422254
The value of local variable ch3 is d at address 6422253
The value of local variable x is 5 at address 6422248
The value of local variable y is 55 at address 6422244
The value of local variable z is 8 at address 6422240

Process returned 0 (0x0)   execution time : 0.123 s
Press any key to continue.

```

Question no: 2

Write a C function which takes three integer inputs, corresponding to RGB components of a colored pixel, and converts them to the YUV color space. The function should have the following prototype.

void rgb2ycbcr(int r, int g, int b, float * y, float * Cr, float * Cb);

Solution

The code added in main.c file is shown below.

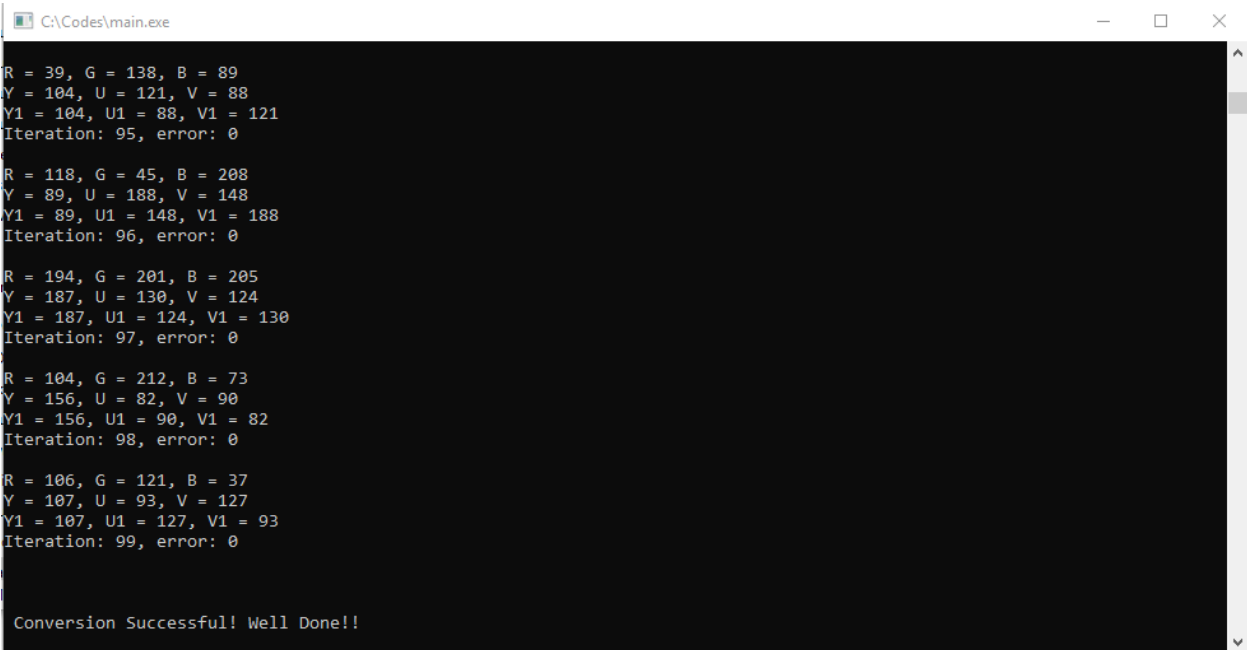
```
#include <stdio.h>
#include "my_lib.h"

int main (void)
{
    int m;
    printf("Program to test color space conversion\n\n");

    printf("Testing color space conversion code: \n\n");
    if(test_code() == 0)
        printf("\n\n Conversion Successful! Well Done!!\n");
    else
        printf("\n\nOops! Conversion failed!!!\n\n");
    scanf("%d",&m);
}

void rgb2ycbcr(int r, int g, int b, int * y, int * cb, int * cr)
{
    * y = (int)(16 + (0.257*r)+(0.504*g)+(0.098*b));
    * cb = (int)(128 + (-0.148*r)+(-0.291*g)+(0.439*b));
    * cr = (int)(128 + (0.439*r)+(-0.368*g)+(-0.071*b));
}
```

After adding this code, we saved the main.c file and generated a executable file for main.c file named main.exe, the result of main.exe is attached below.



```
C:\Codes\main.exe

R = 39, G = 138, B = 89
Y = 104, U = 121, V = 88
Y1 = 104, U1 = 88, V1 = 121
Iteration: 95, error: 0

R = 118, G = 45, B = 208
Y = 89, U = 188, V = 148
Y1 = 89, U1 = 148, V1 = 188
Iteration: 96, error: 0

R = 194, G = 201, B = 205
Y = 187, U = 130, V = 124
Y1 = 187, U1 = 124, V1 = 130
Iteration: 97, error: 0

R = 104, G = 212, B = 73
Y = 156, U = 82, V = 90
Y1 = 156, U1 = 90, V1 = 82
Iteration: 98, error: 0

R = 106, G = 121, B = 37
Y = 107, U = 93, V = 127
Y1 = 107, U1 = 127, V1 = 93
Iteration: 99, error: 0

Conversion Successful! Well Done!!
```

Post Lab Task

Question:

Write a recursive version of the Fibonacci function developed in class.

Solution

The code for this program is attached below,

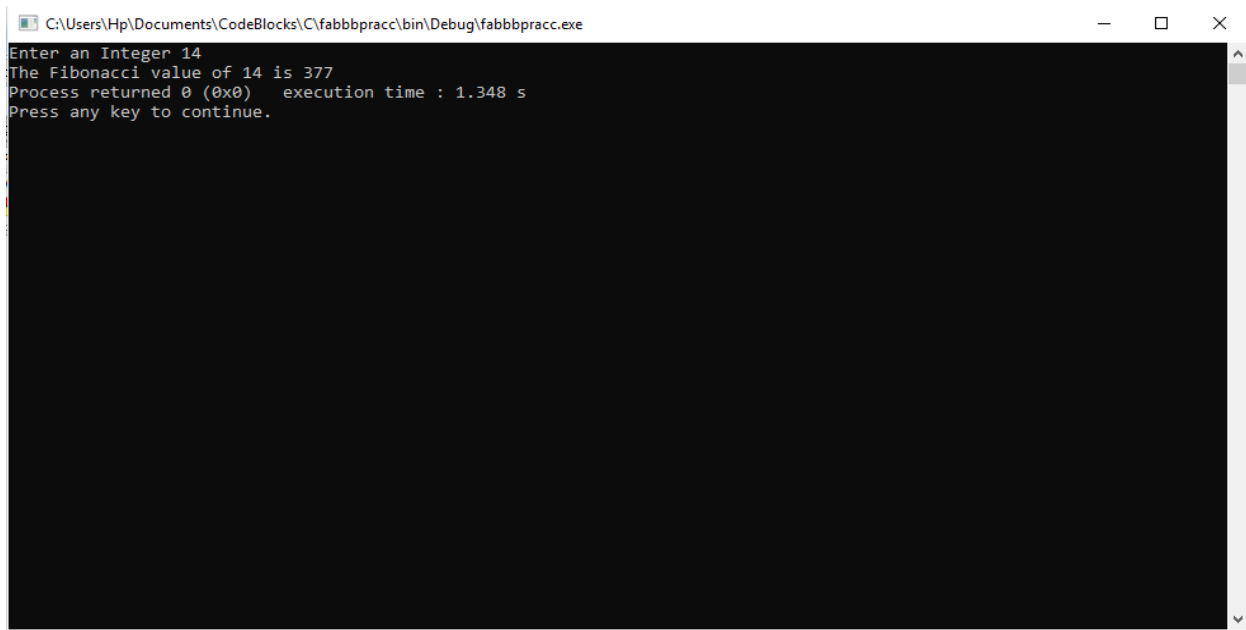
```
int fab_series(int n)
{
    int a=0;
    int b=1;
    int z=0;

    if(n==0)
    {
        z=0;
    }
    if(n==1)
    {
        z=1;
    }
    if(n==2)
    {
        z=1;
    }
    for (int i=2; i<=n;i++)
    {
        z=a+b;
        a=b;
        b=z;
    }
    return z;
}

int main()
{
    int n,result;
    printf("Enter an Integer ");
    scanf("%d",&n);
    result=fab_series(n);

    printf("The Fibonacci value of %d is %d",n,result);
}
```

The Result of this program is attached below,



A screenshot of a Windows command prompt window. The title bar shows the file path: C:\Users\Hp\Documents\CodeBlocks\C\fabbbpracc\bin\Debug\fabbbpracc.exe. The window contains the following text: "Enter an Integer 14", "The Fibonacci value of 14 is 377", "Process returned 0 (0x0) execution time : 1.348 s", and "Press any key to continue.". The rest of the window is black.

```
C:\Users\Hp\Documents\CodeBlocks\C\fabbbpracc\bin\Debug\fabbbpracc.exe
Enter an Integer 14
The Fibonacci value of 14 is 377
Process returned 0 (0x0) execution time : 1.348 s
Press any key to continue.
```

This result verifies that our code is correct as the Fibonacci value for integer 14 is 377.

THE END