Programming Fundamentals

Lab Report

Lab 08

Group Members Name & Reg #:	**Muhammad Haris Irfan** **(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,

```c
void test(void);

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

int main()
{
    int x, y = 5, z = -5;
    int *ptr1 = &x;
    int *ptr2 = &y;
    int *ptr3 = &z;

    printf("The value of local variable x is %d at address %u\n\n",*ptr1,ptr1);
    printf("The value of local variable y is %d at address %u\n\n",*ptr2,ptr2);
    printf("The value of local variable z is %d at address %u\n\n",*ptr3,ptr3);
    printf("The value of global variable m is %d at address %u\n\n",m,&m);
    printf("The value of global variable n is %d at address %u\n\n",n,&n);
    printf("The value of global variable a is %f at address %u\n\n",a,&a);
    printf("The value of global variable b is %f at address %u\n\n",b,&b);
    test();
}

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

    printf("The value of local variable ch1 is %c at address %u\n\n",ch1,&ch1);
    printf("The value of local variable ch2 is %c at address %u\n\n",ch2,&ch2);
    printf("The value of local variable ch3 is %c at address %u\n\n",ch3,&ch3);
    printf("The value of local variable x is %d at address %u\n\n",x,&x);
    printf("The value of local variable y is %d at address %u\n\n",y,&y);
    printf("The value of local variable z is %d at address %u\n\n",z,&z);
}
```

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 coverts 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.

Post Lab Task

Question:

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

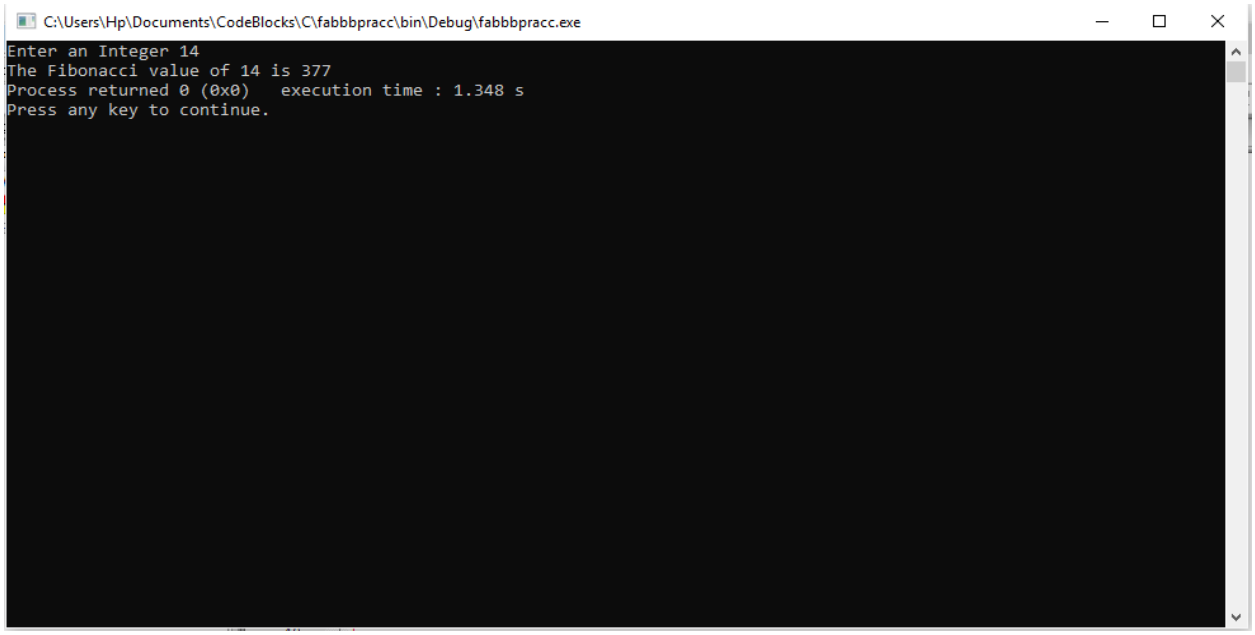
Solution

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,



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

THE END