

## Assignment C/C++:

Q1) Consider the following C function :

```
void fun (int x)
{
    int a, b, c, d;
    d = 1;

    for (a = 1 ; a <= x ; a ++)
    {
        b = a;
        c = 1;
        while (b > 0)
        {
            c &= b % 2; b /= 2;
        }
        d += c;
    }
    printf ("%d\n", d);
}
```

- (a) How many different input values x cause the function to print the result 8 ?
- (b) Write a function with the same behavior but only one loop (of any type) and no library call except for the print statement.

Q2) Improve the enclosed Legacy code(Legacy.cpp), originally designed for Single Threaded machine.

Improvement in the following Areas are Needed :-

- (1) Identify sequential tasks and modify them by enabling multithreading(You can use any multithreading library).
- (2) Modify/add new code as asked in between the existing code.

Q3) While working on Car Simulation project, During the development of "FerrariEngine" plugin (.dll), Engineer forgot include Car's "Power" attribute along with "Timestamp" in its Temperature Logging routine. Also, due to time constraints, Instead of logging temperature data into some file/database, he redirected temperature data to the computer screen through std::cout.

Due to some reasons, modifications into "FerrariEngine"'s source code is not possible now. You have given this Car Simulation project(Find the Enclosed **CarGame** project) and the Incomplete "FerrariEngine" plugin (.dll). Link this **FerrariEngine.dll** with the Car Simulation Project.

Your task :-

Enable logging of Power and Timestamp(HH::MM::SS) attributes as well in CSV format in **a file on disk**. Implement a Thread safe logger class(find the enclosed empty Logger.cpp class) for logging purpose in this task.

Time-Stamp, Power, Temperature

e,g : **14:22:41, 200 Hp, 38 degrees**

**Guidelines :-**

- In the CarGame project, you can add/modify any class/ function etc, in order to capture Power attribute for logging. Modifications in FerrariEngine(**FerrariEngine.cpp**) project is not allowed.
- If the given **FerrariEngine.dll** doesn't link with the **CarGame** project at your end. Then , try to build FerrariEngine project at your end and then link the newly generated/compiled **FerrariEngine.dll** at your end.