Homework #1

The questions in this homework assignment guide you through the process of implementing a function that converts an entire string into upper-case letters, integrated in an execution environment that allows you to test its correct behavior.

Question 1 (2 pt.)

Write a header file that declares a function named `upper_case`, which returns no value, and takes a C string (null-terminated sequence of characters) as its first and only argument. Don't forget the include guards in the header file. Upload this file as attachment on Blackboard, using `UpperCase.h` as the file name.

Question 2 (2 pt.)

Write a C source file that contains an implementation of function `upper_case` written in C. Each line of code associated to a basic block in the equivalent LLVM code of question 4 should be followed by a comment in the same line indicating this label, as done in class. For example:

```
if (x > 10)               // Label 'cond'
      a++;                // Label 'then'
```

Attach this file as `UpperCase.c` on Blackboard.

Question 3 (2 pt.)

Write a main program that takes one argument from the command line, converts it to upper-case characters by invoking function `upper_case`, and prints the resulting string. Attach this file as `main.c`.

Assuming that files `UpperCase.c`, `UpperCase.h`, and `main.c` are located in the same directory, your source code should compile and run without any kind of modifications by invoking the following commands:

```
$ gcc main.c UpperCase.c -o main
$ ./main Hello123
HELLO123
```

Question 4 (4 pt.)

Write an LLVM version of function `upper_case`, and upload it in a file named `UpperCase.ll`. Your program should compile correctly without any modifications, and should provide the same exact output as question 3 by running the following commands:

```
$ llc UpperCase.ll
$ gcc UpperCase.s main.c -o main
$ ./main Hello123
HELLO123
```