**­Computer Architecture Lab (CS 341)**

**Assignment 1: Review of Number Representations** Due Date: 30/08/20

(Lab Assignment 1)

1. Write a C/C++ program to find the internal representation of a given integer (int type). Use your program to answer each of the following.

What is the largest integer (**LI**) that may be represented (express in hex)?

What is the smallest integer (**SI**) that may be represented (express in hex)?

Your program should initiate the following dialogue with the user

Program enters:Enter I or LI or SI or Q

User enters **I** 15

Program enters:………

User enters **I** -67

Program enters:………

User enters **LI**

Program enters:………

User enters **SI**

Program enters:………

User enters **Q**

2. Write a C/C++ program to find the internal representation of floating point (**F**) numbers. Express the representation as a string of 8 hex characters. (You may use a program that you find on the internet but you should understand how and why it works.)

Given a decimal number, use the program to obtain its single precision FP representation.

Also use the program to find or verify:

* The largest integer (**LI**) that may be represented(express in hex).
* The smallest positive (**SP**) number that may be represented(express in hex).
* The smallest positive integer (**SI**) x such that x can be exactly represented but x+1 cannot(express in hex).

Your program should initiate the following dialogue with the user

Program enters: Enter F or LI or SP or SI or Q

User enters **F** 1.5

Program enters: ………

User enters **F** -9876543

Program enters: ………

User enters **LI**

Program enters: ………

User enters **SP**

Program enters: ………

User enters **SI**

Program enters: ………

User enters **Q**

**Output format(for both questions):**

* Regardless of endianness, you should convert the representation so that **the LS byte appears in the rightmost position.**
* For hex string, **DO NOT** print ‘0x’ at the start. **Ex. 0000007C**