**CSE222 Digital Design and Computer Architecture**

**Project 01: Write MIPS program to convert numbers**

**(Spring 2023, SCCC)**

* **Function**

Write a MIPS program to implement functions to convert a number from one number system to another.

* **Requirement:**

1. Write a MIPS program to:
2. Convert binary number to decimal and hexadecimal number
3. Convert decimal number to binary and hexadecimal number
4. Convert hexadecimal number to binary and decimal number
5. The MIPS program **repeatedly** displays the following menu:
6. **Binary to hexadecimal and decimal**
7. **Hexadecimal to binary and decimal**
8. **Decimal to binary and hexadecimal**
9. **Exit**

User enters a number (1 to 3) to select one item from the meu to perform a conversion: once a menu item is selected, user is prompt to enter a number (**in string**) which is the source value. If this source is valid, it will be converted to destination numbers. Display message: **source number, destination-1 number, destination-2 number**. For example, if menu item 1 is select, the message will be:

**Binary number: [*binary-number*]**

**Decimal number: [*decimal-number*]**

**Hexadecimal number: [*hexadecimal-number*]**

After this message is displayed, the menu will be displayed again, so user can select another item.

If menu item 4 is entered, the program will be terminated.

The program should **validate the input string**. For example, if menu item 1 is selected, all characters in the string must be ‘0’ or ‘1’; if item 2 is selected, all characters in the string must be hexadecimal characters ({**‘0’, ‘1’, ‘2’, … ‘9’, ‘A’, ‘B’,…, ‘F’** }). The program will ask user to re-input if the string is invalid.

* **Submission**

A runnable MIPS program.

* **Due**

04/15/2023