# CS101- Algorithms and Programming I

## Lab 03

**Lab Objectives:** Selection statements: if/else if /else, nested if. Comparing numbers, characters, strings.

For all labs in CS 101, your solutions must conform to the CS101 style guidelines (rules!)

1. Write a Java program, Lab03_Q1.java, that calculates and displays the rounded sum of 2 values input by the user, according to the following.
   - An int value is rounded up to the next multiple of 10 if its right-most digit is 5 or more.
   - If the right-most digit is less than 5 it is rounded down to the previous multiple of 10.
   - If the first *rounded* value is a multiple of 3, the second value will not be rounded before adding to the sum.

   **Sample Runs:**
   ```
   Enter 2 numbers: 15 12
   The sum of the rounded values of 15 and 12: 30

   Enter 2 numbers: 34 12
   The sum of the rounded values of 34 and 12: 42
   ```

2. Write a Java program, Lab03_Q2.java, that determines the *age dependency category* for a given country using the information below. Your program should input the required data from the user.

   **Formulas:**
   **Child Dependency:** number of children (age < 15) per each 100 working adults (15-64)
   **Senior Dependency:** number of seniors (age > 64) per each 100 working adults (15-64).

   | Senior Dependency | Child Dependency | Age Dependency Category |
   |---|---|---|
   | Less than 15 | <29 | Low Overall Dependency |
   | | [29 - 45] | Moderate Child Dependency |
   | | > 45 | High Child Dependency |
   | 15 or over | >=29 | Double Dependency |
   | | <29 | High Old-age Dependency |

   **Sample Run:**
   ```
   Enter number citizen under 15: 24391039
   Enter number citizen between 15 and 64: 65374000
   Enter number citizen over 64: 7969090

   Child Dependency: 37.3
   Senior Dependency: 12.2
   Age Dependency Category: Moderate Child Dependency
   ```

3. Write a Java program, Lab03_Q1.java, that inputs a string and an integer value, n, from the user. The program should output an appropriate message if the first and last n characters of the string are the same (case and order). If the last character of the string is punctuation (assume non-alphabetic), the last n characters compared should not include the punctuation symbol.

**Data validation:**
  - If n  is outside the bounds of the string, display an appropriate error message.
  - If n is not an integer, display an appropriate error message.
  - Do not use data structures other than strings or loops in your solution.

**Sample Runs:**

```
Enter a sentence: abcdefgh
Enter an integer value between 1 and 8: 2
First and last 2 characters are not the same

Enter a sentence: abcdefghab
Enter an integer value between 1 and 10: 2
First and last 2 characters are the same

Enter a sentence: abcdefghab.
Enter an integer value between 1 and 11: 2
First and last 2 characters are the same

Enter a sentence: abcd
Enter an integer value between 1 and 4: 5
Error - value must be between 1 and 4

Enter a sentence: abcdef
Enter an integer value between 1 and 6: 5.8
Error - value must be an integer
```