

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. Create a project, Lab03_Q1 in your Lab03 folder. Write a Java program 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. Create a project, Lab03_Q2 in your Lab03 folder. Write a Java program Write a program 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. Create a project, Lab03_Q3 in your Lab03 folder. Write a Java program 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 period.

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.

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
```