The University of Winnipeg

Introduction to Java Programming

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**Assignment 2: decision statements and methods Weight: 20%**

**Project 1: discount**

A department store owner decided to implement a discount system for his employees. The system, which will be developed in Java, will work as follows:

* 10% discount for supervisors.
* 15% discount for sales representatives.
* 20% discount for other employees.
* Managers cannot participate in the discount system.

**System requirements**

* Print a welcome message.
* Ask for the employee's job title.
* Ask for the price of the item the employee wants to buy. System will skip this step if the employee is a manager.
* Print either the new price or a message to managers ("Managers cannot participate in the discount system").

**Rubrics**

* Code in a single Java file.
* A method named *checkDiscount*.
* A switch-case statement in checkDiscount().
* Program does not ask for the item when the employee is a manager.
* Formatted outputs (ex. $30.45 instead of $30.444444447).
* Program works and delivers the expected results.
* Code style (naming conventions, indentation, meaningful comments, etc.).

**Project 2: population**

A research laboratory needs a computer program to predict the size of a population of organisms. The program should ask for the starting number of organisms, their average daily population increase (as a percentage), and the number of days they will multiply. For example, a population might begin with two organisms, have an average daily increase of 50 percent, and will be allowed to multiply for seven days. The program should use a loop to display the size of the population for each day.

Day 1: 2.0 organisms

Day 2: 3.0 organisms

Day 3: 4.5 organisms

Day 4: 6.75 organisms

...

**Input validation**

* Do not accept a number less than 2 for the starting size of the population.
* Do not accept a negative number for average daily population increase.
* Do not accept a number less than 1 for the number of days they will multiply.

**Rubrics**

* Code in a single Java file.
* Program works and delivers the expected results.
* Code style (naming conventions, indentation, meaningful comments, etc.).

**Project 3: converter**

Engineering students need a computer program to convert meters into different units of measurement. The program should ask the user to enter a distance in meters and then present the following menu of selections:

1. Convert to kilometers
2. Convert to inches
3. Convert to feet
4. Quit the program

**System requirements**

* The program will convert the distance to kilometers, inches, or feet.
* The program should continue to display the menu until the user enters '4' to quit the program.
* The program should not accept negative numbers for the distance in meters.
* If the user selects an invalid choice from the menu, the program should display an error message.

**Required methods**

A void method named *showKilometers*, which accepts the number of meters as an argument. The method should display the argument converted to kilometers. Use the following formula:

kilometers = meters \* 0.001

A void method named *showInches*, which accepts the number of meters as an argument. The method should display the argument converted to inches. Use the following formula:

inches = meters \* 39.37

A void method named *showFeet*, which accepts the number of meters as an argument. The method should display the argument converted to feet. Use the following formula:

feet = meters \* 3.281

A void method named *menu* that displays the menu of selections. This method should not accept any arguments.

**Rubrics**

* Code in a single Java file.
* All required methods are implemented.
* Formatted outputs (ex. 12.45 instead of 11.444444447).
* Program works and delivers the expected results.
* Code style (naming conventions, indentation, meaningful comments, etc.).

**Submission guidelines**

Upload your files to the Dropbox folder (Nexus 🡪 Assignments 🡪 Assignment 2) as a zipped folder (with 3 Java files). This file should be named as follows: *your\_full\_name\_java\_assignment\_2*.