

Chapter 3 Assignment A

This assignment consists of a series of problems that can be solved with a computer program. Your objective is to create a program for each problem presented below. Use RubyMine to create a project that contains a source file for each problem. When finished, you will compress the project folder into a single file and submit that file within Blackboard. The assignment consists of 5 problems, each worth 20 points, for a total of 100 points possible.

Getting Started

To begin, open RubyMine and create a new project named `Asg3a`. For each problem, add a file to the project named `Asg3aExn.rb`, where `n` is the problem number. For example, the first problem should be represented by `Asg3aEx1.rb`. Within the file, add a comment block at the top that contains the program's name, your name, date, the course title, your instructor's name, the assignment number, the problem number, and a brief description of the program's purpose.

Below the comment header block, enter in the algorithm, which should consist of a series of steps that, when followed in the order presented, solve the problem. Each step should be a comment within the program. Once the algorithm steps exist, implement each of the steps using actual Ruby code. Run your program using a variety of inputs and make sure you get the expected results based on the data provided.

Problems

1. Create a program that asks the user for the average temperature of the coldest months of the year, i.e. November through February. Then, calculate and display the average temperature over those four months.
2. Create a program that calculates and displays the gas mileage for a vehicle. The user shouldn't have to do any calculations; the program should ask the user to provide the values the program needs to calculate the mileage, do the calculations, and display the result.
3. Create a program that tells the user how much it will cost to fertilize a rectangular yard. Assume the yard has a house and driveway on the lot, both rectangular, that should be subtracted from the total area of the lot. Assume the user must buy fertilizer in bags. The user must enter the cost per bag and the number of square feet of fertilizer per bag. The dimensions of the yard, driveway, and house should also be entered in units of feet.

4. Write a program that determines the tip for a meal. Ask the user for the cost of the meal, and the percentage to tip. The program should then calculate and display the amount of the tip and the total cost of the meal with the tip included.
5. Write a program that determines an individual's body mass index (BMI), which is a statistical measure that compares a person's weight and height. The BMI is determined by dividing the weight (in kilograms) by the height in meters squared. Ask the user for a height in inches and weight in pounds. There are 2.54 centimeters in an inch, 100 centimeters in a meter, 453.59 grams in a pound, and 1,000 grams in a kilogram. Use named constants whenever you think they are appropriate. There are websites that compute the BMI which you can use to verify your answer is correct.

Submitting Your Work

Open Windows Explorer and find the project folder that contains your problem files. Compress the entire folder into a single zip file. Name the file using your last name and first initial, i.e. [SmithK.zip](#). Attach this file to your assignment when submitting it within the course in Blackboard.