

HST 952 Homework 1

1. A physician with a small practice wants you to write a program that calculates the number of minutes he can spend per appointment. He sees 20 patients each day and works an 8 hour day. He needs 20 minutes for lunch, and 5 minutes after each patient visit to write up notes. You may assume for this exercise that each patient gets an equal amount of time with the physician. Write a simple Java program that prints out three lines:
 - a) the number of minutes the physician spends with a patient
 - b) the total number of minutes the physician spends a day seeing all 20 patients
 - c) the total number of minutes the physician spends a day writing notes
2. A computer program is intended to take as input a spreadsheet/table (see illustration below for an idea of the spreadsheet/table's properties) containing 50 patient lab values. Lab values for different types of tests may be stored in the same table. The program should search the table for the potassium lab value of a patient with patient ID 1919, and if found, store the value to a variable called potassiumValue. Write out an algorithm in plain English that describes the steps the computer program should follow to find and store patient 1919's potassium value.

	Patient ID	Test type	Value
1	4312	Sodium	144
2	2123	Potassium	4
3	8465	Sodium	132
...
50	8465	Potassium	3

3. Imagine that in designing a particular hospital's information system, you are asked to come up with an object-oriented model for representing patients at the hospital. Name at least five attributes that a patient might have according to your OO model. For the same hospital information system, you are asked to come up with an object-oriented representation for nurses employed at the hospital. Name five or more attributes that a nurse might have. You should have at least two attributes for a nurse that you did not list as attributes for a patient. Which attributes of your nurses and patients are common to all people? If you were asked to add a representation of physicians to your OO design, how would you do this in such a way that you avoid re-listing those attributes that are common to all people?
4. The product of two numbers **m** and **n**, where **m** and **n** are both greater than or equal to 0 can be calculated using addition by observing the following: **m*n** can be found by adding **m n**'s together (e.g., $2*3$ can be found by adding three 2's together: $2 + 2 + 2 = 6$) or by adding **n m**'s together. Using the observation above, write in pseudo-code
 - a) an imperative programming style algorithm for determining the product of two numbers using addition (in your algorithm, you should make use of variables and assignment)
 - b) a declarative programming style algorithm for determining the product of two numbers using addition (in this algorithm, you may not make use of variables or assignment)

(Hint: you may want to review the factorial example shown in class)