CS520 Module 1 Assignment

General Rules for Homework Assignments

- You are strongly encouraged to add comments throughout the program. Doing so will help your facilitator to understand your programming logic and grade you more accurately.
- You must work on your assignments individually. You are not allowed to copy the answers from the others. *However*, you are encouraged to discuss approaches to the homework assignment with your section mates and the facilitator in your section via the discussion board.
- Each assignment has a strict deadline. However, you are still allowed to submit your assignment within 2 days after the deadline with a penalty. 15% of the credit will be deducted unless you made previous arrangements with your facilitator and professor. Assignments submitted 2 days after the deadline would not be graded.
- When the term *lastName* is referenced in an assignment, please replace it with your last name.

You are strongly encouraged to add comments into your program.

Part1 (50 Points)

Our bank ATM stores the money in the following denominations -- *hundreds*, *fifties*, *twenties*, *tens*, *fives*, *twos*, and *ones*. The bank has the following policy. When a customer withdraws money, the ATM dispenses the amount using the maximum bills from the highest to the lowest denominations. For example, if the customer requests an amount of 293, the ATM dispenses 2 hundreds, 1 fifties, 2 twenties, 1 twos, and 1 ones. Program the ATM using the following guidelines.

1. Create a new Java Project in Eclipse named HW1_*lastName* and complete the following requirements:

   a. Create a package named *cs520.hw1*

   b. Create a class named *Banking* under the above package with the *main* method.

   c. The code in the *main* method should do the following:
      i. Prompt the user for a string input value for the amount in dollars and store it in a variable named *input*.
      ii. Convert the string to an integer and store it in the variable named *amount*. You can assume that the user enters a valid integer number.
      iii. Print the converted integer value to the console.
      iv. Declare the integer variables named *hundreds*, *fifties*, *twenties*, *tens*, *fives*, *twos*, and *ones*.
      v. Declare another integer variable named *remainingAmount*.

vi. Compute the *hundreds* and the *remainingAmount*. Print the information to the console.

vii. Compute the *fifties* and the *remainingAmount*. Print the information to the console.

viii. Compute the *twenties* and the *remainingAmount*. Print the information to the console.

ix. Compute the *tens* and the *remainingAmount*. Print the information to the console.

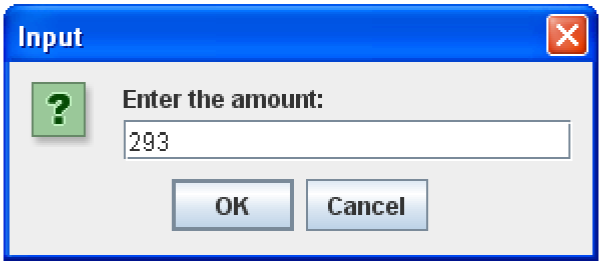
x. Compute the *fives* and the *remainingAmount*. Print the information to the console.

xi. Compute the *twos* and the *remainingAmount*. Print the information to the console.

xii. Compute the *ones*. Print the information to the console.

xiii. Using a message dialog, show the summary of the above values to the user. See the sample input and output below.

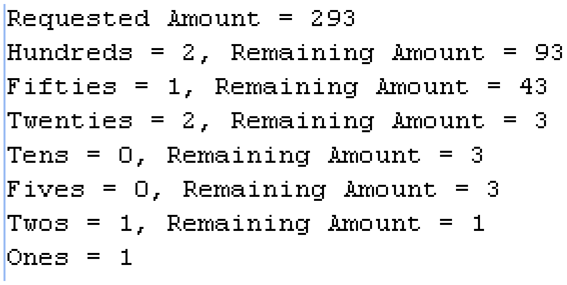
Sample Input:



Enter the amount:

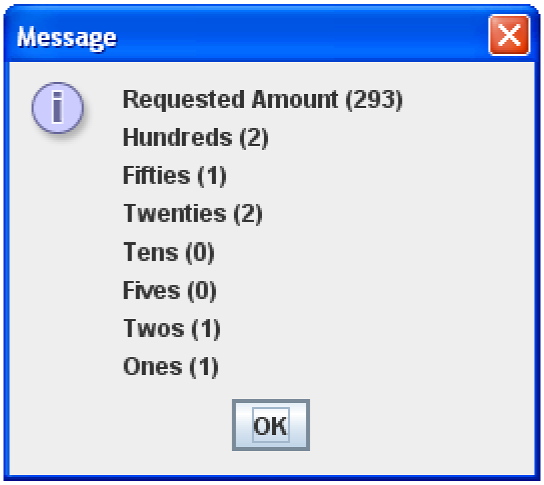
293

Sample Console Output:



```
Requested Amount = 293
Hundreds = 2, Remaining Amount = 93
Fifties = 1, Remaining Amount = 43
Twenties = 2, Remaining Amount = 3
Tens = 0, Remaining Amount = 3
Fives = 0, Remaining Amount = 3
Twos = 1, Remaining Amount = 1
Ones = 1
```

Sample Dialog Output:



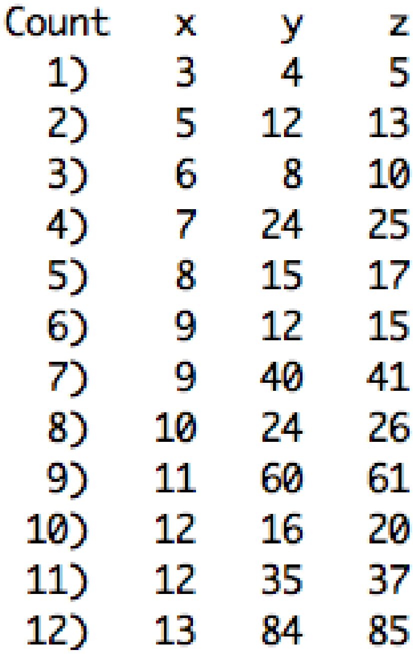
Requested Amount (293)
Hundreds (2)
Fifties (1)
Twenties (2)
Tens (0)
Fives (0)
Twos (1)
Ones (1)

Part2 (50 Points)

Three integer numbers (***x***, ***y***, ***z***) are known as a Pythagorean Triple if the three numbers satisfy the following criterion:

$$x^2 + y^2 = z^2$$

The first few triples are as shown below.



```
Count    x    y    z
  1)     3    4    5
  2)     5   12   13
  3)     6    8   10
  4)     7   24   25
  5)     8   15   17
  6)     9   12   15
  7)     9   40   41
  8)    10   24   26
  9)    11   60   61
 10)    12   16   20
 11)    12   35   37
 12)    13   84   85
```

The program should generate all such numbers where ***x*** and ***y*** are in the range 1 to 100 using the following guidelines:

2. Create a class named *Triples* with the *main* method using the same package as in Part 1.
    a. Use a loop to generate the values for ***x*** in the range 1 to 100.
    b. Now, use a nested loop to generate the values for ***y.*** Your loop should not generate duplicates – for e.g., (3, 4, 5) and (4, 3, 5) are the same.
    c. Calculate the sum of the squares of the values ***x*** and ***y***.
    d. Using the Math.sqrt method, calculate the square root of the above sum. The Math.sqrt method returns a *double* type. (For e..g, Math.sqrt(13) would return 3.6055…)
    e. Cast the above double value to an integer, say ***z***. Now, check if the square of this integer is the same as the value from step (c)
    f. If the above test is true, the pair (x, y, z) is a Pythagorean triple. Print the values to the console.

Submission:

Create an archive of your Eclipse project using the following steps. Select the HW1_*lastName* project in the Eclipse IDE's *Package Explorer* or the *Navigator* window.

Click *File->Export*. Select the *General->Archive File* option. Click *Next*.

Specify the "*To archive file:"* entry as say, C:\Temp\HW1_*lastName*.zip.

The zip file will be created and stored in the C:\Temp folder.

Submit this zip file as an attachment in the Assignment Section.