Homework 2, Due Date: 10:00am 02/13/2014, Cutoff Date: 10:00am 02/18/2014
Submission: Upload all source code (.java) files to Blackboard, and java programs (.class files) to EC2 instances
(Part II will be a required task in the next assignment, please make sure your both EC2 instances work before HW3.)

Part I: Write a client program and a server program to implement the following protocol on top of UDP service.
Client Program:

1. Display a message to ask the User to input the DNS or IP of the machine on which the Server Program runs.
2. Display the following table on the standard output:

Item ID	Item Description
00001	New Inspiron 15
00002	New Inspiron 17
00003	New Inspiron 15R
00004	New Inspiron 15z Ultrabook
00005	XPS 14 Ultrabook
00006	New XPS 12 UltrabookXPS

3. Display a message on the standard output to ask the User to input an Item ID, and validate the user input. If the input is not a valid Item ID, ask the User to re-type it.
4. Once getting a valid item ID from the User, send a request including this Item ID (e.g., 00005 or "00005") to the Server program to ask for a quote, and record the local time right before send such request.
5. Receive and interpret the response from the Server program, get the local time right after such response is received, and display the following information on the standard output, (e.g., if 00005 were provided by the User earlier on)

Item ID	Item Description	Unit Price	Inventory	RTT of Query
00005	XPS 14 Ultrabook	$999.99	261	… ms

   where "RTT of Query" is the difference between the time in Steps 4 and 3 in millisecond.
6. Display a message on the standard output to ask the User whether to continue. If yes, repeat steps 2 through 4. Otherwise, close the socket and terminate the Client program.

- Server Program:
  1. Maintain the following information using an appropriate data structure of your choice (i.e., an array of a Class you defined). You do not have to place it in a file although you certainly can if you like.

Item ID	**Item Description**	**Unit Price**	**Inventory**
00001	New Inspiron 15	$379.99	157
00002	New Inspiron 17	$449.99	128
00003	New Inspiron 15R	$549.99	202
00004	New Inspiron 15z Ultrabook	$749.99	315
00005	XPS 14 Ultrabook	$999.99	261
00006	New XPS 12 UltrabookXPS	$1199.99	178

  2. Wait for receiving a packet from a Client.
  3. Once a packet is received from a Client, retrieve the information relevant to the requested Item ID from the data structure you used in Step 1 and send back such information to the Client.
  4. Repeat Step 3 infinitely until an exception is caught.
  5. Close the datagram socket.

Part II: Test your programs with multiple clients using the Amazon EC2 Cloud. (10 Extra Bonus Points)
(Please don't delete your programs on EC2 instances. The instructor will start your instances and test your programs to give credits for Part II. The latest time of your .class files on your EC2 instances is considered as the submission time of part II.)

1. Make a directory "**HW02**" under your home directory on each of your EC2 instances.
2. Upload the ***server*** program under "HW02" on your instance in *N. Virginia* and the ***client*** program under "HW02" on your instance in *Sydney*.
3. Run the server program. Meanwhile, run the client program on your computer or lab computer and, simultaneously, on your EC2 instance in *Sydney* to test all the possible cases.

 Please STOP your ec2 instances whenever you are NOT working on them. Please do NOT start or stop ec2 instances whose names do not contain your user name. Thank you!