

## CSE 142 Section Handout #5

### Challenge Sheet

*You are not expected or required to solve these problems. These problems are designed for students who want a fun, extra challenge to test their skills on harder programming problems.*

*Have fun!*

In this problem, you will be simulating a very basic stock that goes up or down a random amount once every day. You will then be given the choice to buy one stock, sell one stock, or do nothing for each day that passes. This simulation should continue until you reach a specific target amount or you have no cash. You are allowed to buy stock even when you don't have the cash for it but you should not be able to sell stock when you have no stock to sell. The user should input "sell" to sell stock, "buy" to buy stock, and enter nothing to do nothing. You will start with one stock and zero dollars in this simulation. Each day, we want to print out the current stock price, the amount of cash we have, and the number of stocks we hold. At the end of the simulation, we want to display how much cash we have at the end.

The stock should be updated once every day given the following formula given a random object `r` and an integer variance:

```
(int) Math.round(r.nextGaussian() * Math.sqrt(variance));
```

This update should be added to the stock price every day.

The method itself should be named `stonks` and should take in 5 parameters: a random object, a scanner that reads input from console, an integer representing the initial stock price, an integer representing the target amount we want to reach, and an integer that determines the variance of our stock graph. An example call of `stonks(r, console, 100, 25, 120)` is shown below with user input highlighted in bold below:

```
Today's Price: 110
Current Cash: 0
Current Number of Stocks: 1
What would you like to do? sell
Today's Price: 97
Current Cash: 110
Current Number of Stocks: 0
What would you like to do? buy
Today's Price: 97
Current Cash: 13
Current Number of Stocks: 1
What would you like to do?
Today's Price: 102
Current Cash: 13
Current Number of Stocks: 1
What would you like to do?
Today's Price: 111
Current Cash: 13
Current Number of Stocks: 1
What would you like to do? sell
You ended with $124
```

## CSE 142 Section Handout #5

### Solutions (One Possible Solution Provided)

1.

```
public static void stonks (Random r, Scanner console, int
stockPrice, int target, int variance) {
    int cash = 0;
    int stockNum = 1;
    while(cash > 0 && cash < target) {
        stockPrice += (int) Math.round(r.nextGaussian() *
Math.sqrt(variance));
        System.out.println("Today's Price: " + stockPrice);
        System.out.println("Current Cash: " + cash);
        System.out.println("Current Number of Stocks: " + stockNum);

        System.out.print("What would you like to do? ");
        String answer = console.nextLine();
        if (answer.equals("buy")) {
            cash -= stockPrice;
            stockNum++;
        } else if (answer.equals("sell") && stockNum > 0) {
            cash += stockPrice;
            stockNum--;
        }
    }

    System.out.println("You ended with $" + cash);
}
```