

Since this is the week after a test, and also because there have been some people raising concerns that their struggles in this course don't relate to the material but relate to how to apply it, I've decided to try something a bit different. First, read the assignment specifications fully. Please take some time to think about and try to implement each program before reading the hints here. If you find yourself struggling too much with the concepts of how to even begin implementing a program, though, you can use the hints below to help direct you. Try reading one hint at a time, then returning to working on the program for a while before reading the next. Your goal should be to read as few hints as possible to solve the problem. (These hints are listed in order of least to most relevant, so read them in order.)

#### **Number Counting Hints:**

1. Read and process each number one at a time in order.
2. As you loop over the numbers you read in, think of keeping track of the previous number you have seen and the number of times you have seen it.
3. For each number you read, there are two possibilities:
  - a. this number is the same as the previous number
  - b. this number is different from the previous number
4. For each of these cases:
  - a. if this number is the same as the previous, don't output it yet (more may be coming)
  - b. if this number is different from the previous, we're done seeing the previous number, so output it
5. For each of these cases:
  - a. if this number is the same as the previous, we don't want to output it multiple times, so keep waiting to output it and just update the count of this number with this new information.
  - b. if this number is different from the previous, we want to go ahead and output the previous number and its count (since that's the last we'll see of that number), and then update the variables that hold the previous number and count to relate to this new number and its count (1 so far).
6. Don't forget at the end to output the last number and its count, since we won't see a number after it (it's the last), and thus the condition that would output it won't occur.

**Point Plotter Hints:**

1. Think of looping over each row, and inside that looping over each column.
2. More accurately: each row is actually two rows, since you need one row for the divider line and one for the empty space; you can do this by looping over each column twice within each row iteration.
3. Within these loops, you are mostly outputting the same characters each time. You just have to figure out where each character outputs. Think through the process of how the loops run and where you would output each character going left to right, top to bottom.
4. (Get the previous step working before trying this one.) The only change each time the inner loop iterates is that you need to decide within each column when to output an "X" instead of a " ".
5. The decision of when to output an "X" instead of a " " can be done with a simple `if` statement that checks if you are in the same column and row as the point you're plotting in this current iteration of the loops.

**Savings Hint:**

1. First prompt for and input all the values you are told to input.
2. Think about just looping over every month and simulating the changes in the savings account, updating the current balance as you go.
3. Note: the interest rate is annual, so you need to apply only 1 month's worth at a time.
4. The first month (month 0), there's no deposit (since you're depositing the initial amount), but there is a gain of interest at the end of the month.
5. Every month after that (1+), you add the additional amount, output the updated balance, then add the interest to the balance.
6. Your output for each iteration to the file should simply be the month number and the amount.
7. Your output for each iteration to standard output should only occur if you are on a month that starts a year (the number of months left after removing all the whole years is 0 [think modulus]).