In Class 10 Exercises - Arrays

Assignment Overview

Basic use of arrays.

Part A

Declare an array of 100 int elements, and put the value (index*index) into each element. For example, arr[3] should be set be equal to 9, arr[5] equal to 25, etc.. Use a **`for`** loops.

Use a separate for loop to print the array, one element per line, e.g.

```
array[0] = 0
array[1] = 1
array[2] = 4
array[3] = 9
...
array[99] = 9801
```

Part B

1. Declare an array of 100 int elements, or use the same one.
2. Prompt for a filename and open it to read from it
3. Read 1 number at a time into each element of the array.
4. Use a for loop to read 100 numbers; do **not** use a while until end-of-file loop!
5. Print the 11th, 21st, 31st, 41st, 51st numbers (indexing starts at 0!)
    a. You do not need a loop or anything special for these 5 lines, just use 5 cout statements.
6. Output should look like this:

```
Input File Name B: input.txt
array[10] = 11
array[20] = -12
array[30] = 892
array[40] = 28762
array[50] = -1
```

Part C

Copy the code from Part B. Modify the code to read until end-of-file as well as ONLY read 100 numbers, **whichever comes first**. Only print the last element in the array; do not print all of the elements in the array. To test this, create a file with only a few numbers in it.

- Output should look like this for a file with just 12 numbers:

```
Input File Name C: inc.in
array[11] = -9786
```

- Or like this if there are 100 **or more** numbers in the file. You only read the first 100!

```
Input File Name C: inc.in
array[99] = -42
```

- Test this with exactly 100 numbers in the file; also, with 99 numbers; also, with 110 numbers; and make sure your code is correct!

Test Data

```
1 2 3 4 5 6 7 8 9 10
1 2 3 4 5 6 7 8 9 10
1 2 3 4 5 6 7 8 9 10
1 2 3 4 5 6 7 8 9 10
1 2 3 4 5 6 7 8 9 10
1 2 3 4 5 6 7 8 9 10
1 2 3 4 5 6 7 8 9 10
1 2 3 4 5 6 7 8 9 10
1 2 3 4 5 6 7 8 9 10
1 2 3 4 5 96 97 98
```

Submit your work to Web-CAT

Only the first 3 parts will be graded, but problems like Part D have been on the final. This assignment may not be published on Web-CAT until sometime Friday!

Part D

You should work on this problem, but it will not be graded

Use arrays to calculate the Fibonacci sequence. You must set the first 2 elements equal to 0 and 1, then each of the "next elements" are equal to the previous 2 elements added together.

fibArr[0]=0
fibArr[1]=1
fibArr[2]=1
fibArr[3]=2
fibArr[4]=3
fibArr[5]=5
fibArr[6]=8
fibArr[7]=13

fibArr[i]=fibArr[i-1] + fibArr[i-2] ; // This is the code you need in a for loop.

fibArr[8] = fibArr[7] + fibArr[6] ==> 13 + 8 = 21

Start with an array of 100 integer elements. Again, use a for loop to do the calculations, and then use another for loop to print the values. Print the Fibonacci sequence all on 1 line, like this: 0, 1, 1, 2, 3, 5, 8, 13, 21, ...

This programming problem has previously appeared on the final.

Note what happens when the numbers get really big.
Change the data type for the array to **`long long`**, and print them again.

This is the code you should turn in for this part.