

Homework 06

CS-102

Spring 2022

Homework 06A

Judging a Sports or Talent Event

- A particular competition has five judges, each of whom award a score between 0 and 10 to each performer.
- Fractional scores, such as 8.3, are allowed.
- A performer's final score is determined by dropping the highest and lowest score received, then averaging the three remaining scores.
- Write a program that uses this method to calculate a contestant's score. It should include the following functions:

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- **void getJudgeData()** should ask the user for a judge's score, store it in a reference parameter variable, and validate it. This function should be called by **main** once for each of the five judges.
- **void calcScore()** should calculate and display the average of the three scores that remain after dropping the highest and the lowest scores the performer received. This function should be called just once by **main** and should be passed the five scores.
- **double findLowest()** should find and return the lowest of the five scores passed to it.
- **double findHighest()** should find and return the highest of the five scores passed to it.

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- Input Validation: Do not accept judge scores lower than 0 nor higher than 10.
- Sample Input/Output:

```
Grace Hopper's Scoreboard
Enter Score from a Judge: 9.7
Enter Score from a Judge: 6.9
Enter Score from a Judge: 8.4
Enter Score from a Judge: 7.9
Enter Score from a Judge: 8.3
The Mean of the 3 middle scores is: 8.20
```

- Call your program: *YourName-Hwrk06A.cpp*

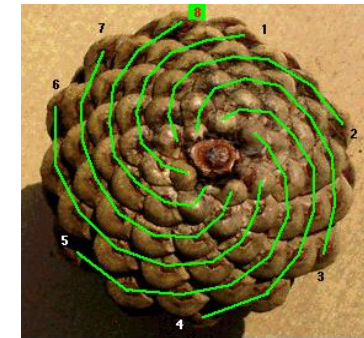
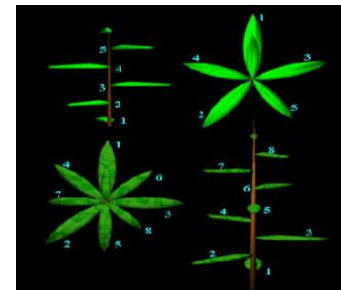
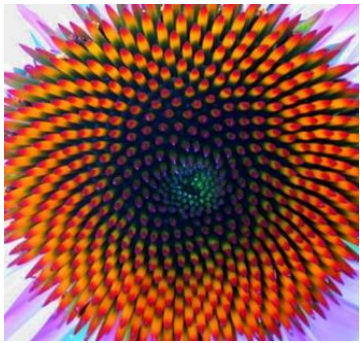
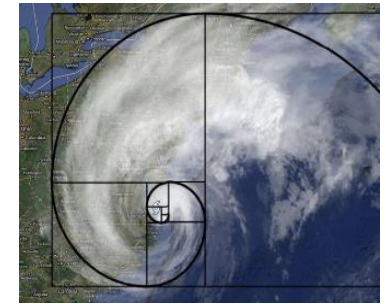
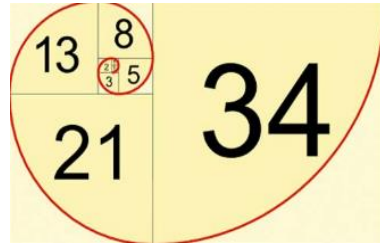
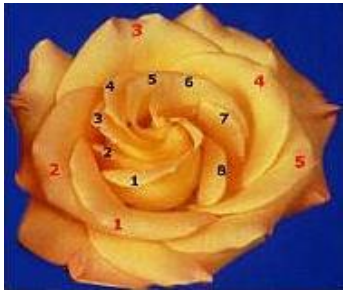
Homework 06B

Fibonacci Sequence

- In the year 1202, the mathematician Fibonacci wrote a paper in which he described numbers having the sequence: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, ...
- A Fibonacci number is always equal to the sum of the previous two Fibonacci numbers (given that the first two Fibonacci numbers are 0 and 1).
- Try it out on the list above, and see if it works.
- These numbers are found everywhere in nature. Here are just a few visual examples:

Homework 06B

Here are just a few visual examples of Fibonacci Sequences



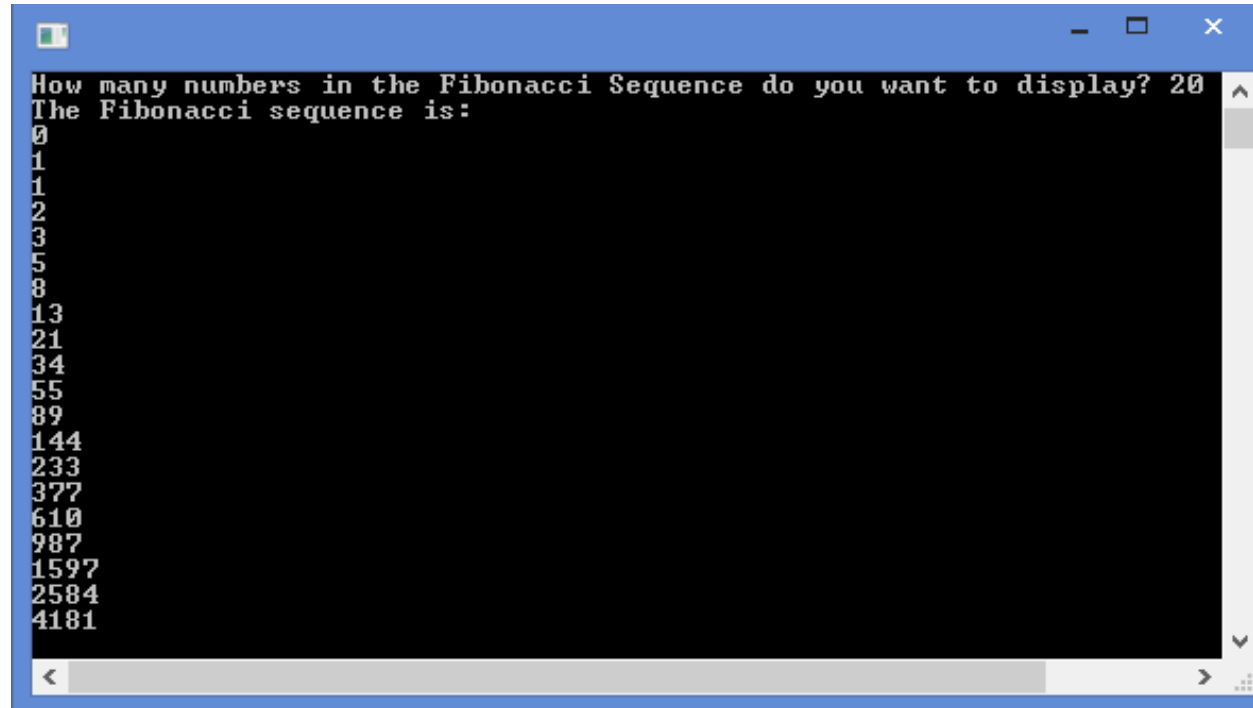
Homework 06B

Fibonacci Sequence

- Create a program which will print out as many numbers in the Fibonacci sequence as you type into the program. Test to be sure that the number you type in is > 1 but < 46 .
- A Fibonacci sequence is defined as follows:
- $F_n = F_{n-1} + F_{n-2}$ In other words, if $n=3$, then F_3 will be given by $F_2 + F_1$ or $1 + 1 = 2$. F_4 will be given by $F_3 + F_2$ or $1 + 2 = 3$. And so forth.
- Create a function called, **nextFibo(int, int)** , which will contain two arguments, F_{n-1} and F_{n-2} . The function will generate the next Fibonacci number in the sequence based on the two previous Fibonacci numbers given as arguments.
- The first two numbers in the sequence are: $F_0 = 0$ and $F_1 = 1$
- Hint: If you make the arguments in nextFibo() reference parameter variables, then you'll shorten your program a bit.

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- Here is some sample input and output:



```
How many numbers in the Fibonacci Sequence do you want to display? 20
The Fibonacci sequence is:
0
1
1
2
3
5
8
13
21
34
55
89
144
233
377
610
987
1597
2584
4181
```

The image shows a terminal window with a blue title bar. The text inside the terminal is white on a black background. It shows a prompt asking for the number of Fibonacci numbers to display, followed by the output of the sequence.

- Call your program: *YourName-Hwrk06B.cpp*