

CSC1321 Final Exam Review

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Web: <http://cs.txwes.edu/csc1321>

Exam Info

1. The final exam is accumulative. It covers all chapters we studied throughout this semester.
2. The final exam consists of two components: programming on computer and paper test.
3. For the programming on computer part, you will write computer programs to solve two problems. The level of difficulty would be the same as that of most lab assignments. To facilitate the programming test, the instructor may help you fix some “major” syntax or grammar errors if you need. Students are responsible for program design, coding and testing. For instructor to be able to help other students during the exam, a student should not “demand” too much time from the instructor.
4. The format of the questions on the paper test part will be similar to that of the homework and previous quizzes.
5. The final exam is open-book and note. Students are allowed to work on the exam as long as they need.
6. The final exam starts at 1:00pm on 12/6 (Tuesday) in SST-111. (<http://www.txwes.edu/registrar>).
7. Messaging and web surfing are not allowed during the exam. Texas Wesleyan’s Academic Integrity rules should be followed.

Topics To Be Covered

1. Functions: basic function declaration and definition. How to call to functions.
2. Loops: while, do-while, and for loops. Be able to use loops to do: read and/or write data from/to files, print out two-dimensional patterns (nested loops), find sum of multiple numbers, and find the largest or smallest number from a list of numbers.
3. Switch statement. Be familiar with the structure of switch statement and programming techniques using switch such as code sharing by multiple cases (or follow through multiple cases), default case, use within a loop.

4. Selection control structures. Boolean expressions (relational and logic), precedences of relational (`==`, `!=`, `>`, `<`, `<=`, `>=`) and logic (`&&`, `||`, `!`) operators. `if` statement without `else`, `if-else`, and nested `if-else`.
5. Input and output: `cin`, `cin.get`, `cin.ignore`, `cout`, `ifstream`, `ofstream`.
6. Strings. `string` data type and its built-in functions such as `length`, `substr`, and `find`.
7. C++ library functions such as `sqrt`, `pow`, `abs`, etc.
8. Output formatting. `setw`, `setprecision`, `showpoint`, `fixed`, etc.

Sample Programming Problems

1. Find the solution to a quadratic equation $ax^2 + bx + c = 0$ using the formula:

$$x = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

2. Write a program using nested loop to print out a triangle.

```

0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0
0 0 0 0 0 0
0 0 0 0 0
0 0 0 0
0 0 0
0 0 0
0 0
0

```

3. Write a program using nested loop to print out a $n \times n$ matrix with 1s on diagonal and zeros in the rest.

```

1 0 0 0 0 0 0 0 0 0
0 1 0 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0 0 0
0 0 0 1 0 0 0 0 0 0
0 0 0 0 1 0 0 0 0 0
0 0 0 0 0 1 0 0 0 0
0 0 0 0 0 0 1 0 0 0
0 0 0 0 0 0 0 1 0 0
0 0 0 0 0 0 0 0 1 0
0 0 0 0 0 0 0 0 0 1

```

4. Write a program using nested loop to print out a $n \times n$ matrix with 1s on diagonal and zeros in the rest.

```
0 0 0 0 0 0 0 0 0 1
0 0 0 0 0 0 0 0 1 0
0 0 0 0 0 0 0 1 0 0
0 0 0 0 0 0 1 0 0 0
0 0 0 0 0 1 0 0 0 0
0 0 0 0 1 0 0 0 0 0
0 0 0 1 0 0 0 0 0 0
0 0 1 0 0 0 0 0 0 0
0 1 0 0 0 0 0 0 0 0
1 0 0 0 0 0 0 0 0 0
```

5. Sum all the integer numbers stored in a file without knowing the contents in the file.
6. Find the largest integer in a file with a number of integers.
7. Write a “robust” interactive temperature converter with a user menu.
8. Write a program to generate a sequence of Fibonacci numbers using loop. The sequence pattern is like:

1, 1, 2, 3, 5, 8, 13, 21, ...

Also calculate the ratios of two successive numbers. The ratios approach a constant called the Golden Ratio (1.618...) when the sequence is very long.

Study Tips

1. You are encouraged to review all the homework and previous tests. The solutions to some problems have been posted on the course website.
2. Memorizing “facts” from textbook or lectures is necessary to learning, but understanding, critical thinking and problem solving skills are more important in learning of mathematics and sciences.
3. Reading textbook definitely helps you understand the subjects.
4. Group study would work well if you study before participating.
5. The last but not least. Learn to ask for help whenever you need.

You can ask a question and look stupid, or not ask a question and be stupid. - Anonymous quotation