

Due Tuesday, 14 Sep 1999, at the beginning of class.

1 Reading

Read Chapter 2 of the textbook.

2 Problems

When submitting a program, please submit the program's code prepended with comments briefly describing its input and output. Please indent your code to make it readable. See Section 2.5 of the textbook for style hints. If you desire, you can also submit examples demonstrating your program's correctness.

1. A sequence begins 0, 1, 1, 2, 3, 5, 8, 13. Write a program producing the first thirty entries in this sequence. What are they?
2. Write a program showing how to add all possible pairs of hexadecimal digits. Print the sums one per line. The first and second lines could be

$$0 + 0 = 0$$

$$0 + 1 = 1.$$

Be sure to print the answer using hexadecimal numbers.

3. Write a program to convert a Fahrenheit temperature to Celsius. The Celsius temperature is $(5/9)(F - 32)$, where F is the Fahrenheit temperature. The program should ask the user for the Fahrenheit temperature and should print the temperature in Celsius.
4. Write a program to determine the largest and smallest possible values that an *int* variable can attain on the computers we use for class. What are the values? Another type is *unsigned int*, which means that it only holds nonnegative values. What is the largest value an *unsigned int* variable can hold?
5. In Norton Juster's children's story *The Phantom Tollbooth*, the Mathemagician gives Milo the following problem to solve:

$$4 + 9 - 2 * 16 + 1 / 3 * 6 - 67 + 8 * 2 - 3 + 26 - 1 / 34 + 3 / 7 + 2 - 5.$$

According to Milo's calculations, which are corroborated by the Mathemagician, this expression "all works out to zero." If you do the calculation, however, the expression comes out to zero only if you start at the beginning and apply all the operators in strict left-to-right order. What would the answer be if the Mathemagician's expression were evaluated using C++'s precedence rules?

In your answer, show the order the operations are performed. An easy way to do this is to copy the entire expression and then replace the performed operation by its value. Copy the resulting expression to the next line and continue. (Using a text editor to copy the expression may be useful.)