Today in CS161

- ***Prepare for the Final***

  - **Reviewing all Topics this term**
    - Variables
    - If Statements
    - Loops (do while, while, for)
    - Functions (pass by value, pass by reference)
    - Arrays (specifically arrays of characters)

How to prepare for the Final Exam

- Best place to start preparing for the final exam is...
  - Homework #6 which has you practice each of the constructs
  - Practice with the demo programs
    - Take them, modify them, replace one loop for one of the other loops
- Final exam is 2 hours long
  - Closed book, Closed notes
  - It will cover: Algorithms, Ethics, Style, and Programming
  - You will NOT be asked to write a complete program (whew!)

Sample Programming Questions

- Write a C++ statement to answer each of the following:

1. Display your name to the screen

2. Let's say you have a variable that contains your age. Show how you would display it on the screen

3. Show how to add 1 to your age

The Basics

- Write a C++ statement to answer each of the following:

1. Show an example of an assignment statement. What goes on the left hand side?

2. What is the difference between integer division and floating point division – can you give an example?

   portion = 10/3;   ←what is the answer?

   portion = 10.0/3.0; ← how is this different?

The Basics

- Write a C++ statement to answer each of the following:

1. Show two example of comments…

2. Where should comments be placed?

3. Assume you have an integer variable "count". Show how to define (create) the variable.

4. Now, show how to add 2 to the variable "count" and store it in the variable "total"

Sample Programming Questions: Math!

- Some math…   given: int count; and, int total;

1. Multiply count by 4 and store it into total

2. Find the remainder of dividing count by 3, output the result

3. How can you find out if count is an even number?

4. What is the difference between the += and the + operations?

Sample Programming Questions: Trivia

- Trivia…

1. What does each C++ statement end with?

2. Does cin do input or output?

3. Variables must start with what …. Show an example

4. The << is for input or output?

5. A group of statements, such as the contents of a function are enclosed by what symbols?

Sample Programming Questions

- Short coding questions

1. Store the integers 62 and 99 in two variables; store the sum of these two in variable total

2. Compute the sales tax on a $52 purchase assuming that sales tax is 4%

3. You have four values (in four different variables). Show how you could calculate the average of all four.

Sample Programming Questions

- Change the previous questions

1. Read in two integer values and store the sum of these two in variable total

2. Read in the amount of purchase and sales tax and compute the amount of tax.

3. You have four values that you read in from the user (in four different variables). Show how you could calculate the average of all four.

If Statements

1. Write an if statement that checks to see if x is 100 or if y is zero

2. Write an if/else statement that displays a message indicating whether chr (a character variable) is one of the following symbols: . ; , or !

3. Write an if statement that displays an error message if the variable "grade" is not 0 through 100 (valid values are 0-100).

If Statements

1. Explain what the || does. Give an example of when it could be used

2. Explain what the && does. Give an example of when it could be used

3. True or False: = and == are the same

4. True or False: all lines in a block {} should be indented after the if

5. True or False: x != y is the same as x > y || x < y

6. True or Fasle: y < x is the same as x >= y

If Statements

1. The following statement should determine if x is not greater than 20. What is wrong with it:

   if (!x > 20)

2. The following statement should determine if count is within the range of 0 through 100. What is wrong with it:

   if (count >= 0 || count <= 100)

3. The following statement should determine if count is within the range of 0 through 100. What is wrong with it:

   if (count < 0 || count > 100)

Loops!

1. Write a while loop that lets the user enters a number. The number should be multiplied by 10 and the result stored in variable product. The loop should continue as long as product contains a value less than 100.

2. Write a for loop that displays 0, 10, 20, 30, 40, 50,…1000

Loops!

1. Write a do while loop that asks the user to enter a number and echoes the number to the screen. It continues to do this as long as a negative value has been entered.

2. Write a loop that displays 10 rows of 15 # signs

Loops!

1. Why should you indent statements in the body of a loop?

2. Which loop would you use if you knew the number of times it was going to iterate (or loop)?

3. Which loop would you use to confirm the user's input?

Loops!

Ask the user to enter in a positive number. Read it in.

1. Then, loop for that many times. Each time through the loop read in a number entered by the user and sum it together with the others.

2. Or, loop for that many times – summing up all of the values from1 until that number. So, if 10 was entered, then it will sum together 1+2+3+4+5+6+7+8+9+10

3. Write a loop to display a-z characters…be creative!

Functions!

1. Explain pass by value

2. Explain pass by reference

3. What data type can be the returned type of a function

4. What does it mean if a function has a void return type

5. The toupper function is a pass by value function. What does that mean since we are trying to upper case a character? How do we call the function to get an upper case character back?

Functions!

1. How many returned values can a function have?

2. Write a prototype for a function named "calculate" that returns a float and has two integer arguments (age and num) passed by value.

3. Write a prototype for a function named "days". It should return an integer and have three integer arguments: years, months, and weeks passed by value.

Functions!

1. What is a local variable?

2. If two functions have the same local variable – does it share the same memory or do they use different memory locations?

3. Why do local variables lose their values between calls to the function in which they are defined?

4. Show how you return a value from a function…

Functions!

1. Given this function prototype – show an example of how to call it…   void showValue (int quantity);

2. The following statement calls a function named "half". This function returns a value that is half that of the argument (a floating point value). Write the prototype:

3. True or False: Function prototypes are terminated with a semicolon

4. True or False: The header of a function (where you write the function) is ended witih a semicolon

Arrays

1. Show how to create an array of 100 characters

2. Create an array big enough to hold the word "hello"

3. What is the index of the first element in an array

4. Show how to read in a sentence and store it in one array. Assume the sentence is no longer than 131 characters and it ends with a period

Arrays

1. Display a message if the first character of the sentence is capitalized

2. Write a loop to find out how many lower case letters are in the array

3. If an array contains the word "fun", what number will strlen return?

4. What is the difference between cin >> array and cin.get(); versus cin.get(array, size);