CSCE 145 Exam 1 Review

What to Expect

- Variables and Basic Computation
- Strings and String Operations
- Branching Statements
- Loops
- Arrays and Multidimensional Arrays
- Anything covered in a virtual lecture or lab, besides sorting arrays.

What will NOT be on the Exam

- Switch statements
- For-each loops
- Enumerations
- Sorting Arrays
Variables, Branching Statements, and Loops

1. Using the provided code, write a program where the user enters a number greater than 0, and the program prints out a right triangle of asterisks (*) where the number is the width of the base and the height. The triangle’s base must be at the top and the point must be at the bottom. If the user enters an invalid value, then the program should print out “Invalid Value” and stop the program.

Solution Tests:
• Does the solution compile?
• Does the solution have your name in the comments?
• Does the solution have a high-level solution description (150-300 words) in the comments?
• If the user enters 5, then does the program print out:
  ****
  ****
  ***
  **
  *

• If the user enters 3, then does the program print out:
  ***
  **
  *

• If the user enters -1, does the program print out “Invalid Value” and stop the program?
2. Using the provided code, write a program where the user enters a number, and then the program adds 10 from that number until the it is greater than 50. It must print out the new value at each step.

Solution Tests:
- Does the solution compile?
- Does the solution have your name in the comments?
- Does the solution have a high-level solution description (150-300 words) in the comments?
- If the user enters 14, then does the program print out:
  
  14
  24
  34
  44

- If the user enters -10, then does the program print out:
  
  -10
  0
  10
  20
  30
  40
  50

- If the user enters 49, does the program print out:
  
  49
3. Write a program that prints out each position per 1.0 simulated second of a
particle given an initial starting x and y position, velocities in the x and y
direction, and a simulated number of positive, non-zero seconds. The equation for
calculating positions are:

Current X = Starting X + Velocity X * Current Simulated Second
Current Y = Starting Y + Velocity Y * Current Simulated Second

Make sure that for each simulated second, including the initial second 0.0, it
prints out on a separate line the current second, the current x position, and the
current y position in the following format:

“Second: "<<current simulated second>>“ x: "<<current x>>“ y: "<<current y>>

Values denoted in “<< >>” represent variable values, and strings in quotations
denote literal values (make sure to follow spelling, capitalization, punctuation,
and spacing exactly). Also, if the number of seconds is less than or equal to 0 then
output “Invalid Value” and stop the program.

Solution Tests:
- Does the solution compile?
- Does the solution have your name in the comments?
- Does the solution have a high-level solution description (150-300 words) in the
  comments?
- If the user enters 0.0 for the starting x, 0.0 for the starting y, 1.0 for the x velocity,
  1.0 for the y velocity, and 10.0 for the number of seconds, then does the program
  print out:

  Second: 0.0 x: 0.0 y: 0.0
  Second: 1.0 x: 1.0 y: 1.0
  Second: 2.0 x: 2.0 y: 2.0
  Second: 3.0 x: 3.0 y: 3.0
  Second: 4.0 x: 4.0 y: 4.0
  Second: 5.0 x: 5.0 y: 5.0
  Second: 6.0 x: 6.0 y: 6.0
  Second: 7.0 x: 7.0 y: 7.0
  Second: 8.0 x: 8.0 y: 8.0
  Second: 9.0 x: 9.0 y: 9.0
  Second: 10.0 x: 10.0 y: 10.0

- If the user enters 1.0 for the starting x, 2.0 for the starting y, 3.0 for the x velocity,
  4.0 for the y velocity, and 5.0 for the number of seconds, then does the program
  print out:

  Second: 0.0 x: 1.0 y: 2.0
• If the user enters 1.0 for the starting x, 2.0 for the starting y, 3.0 for the x velocity, 4.0 for the y velocity, and 0.0 for the number of seconds, then does the program print out:

Invalid Value
Arrays
4. Using the provided code, write a program that finds the minimum and maximum number in an array and then subtracts the maximum from the minimum and prints the result. The first line printed must be in the format:

<<maximum>>“-”<<minimum>>“=”<<result>>

Values denoted in “<< >>” represent variable values, and strings in quotations denote literal values (make sure to follow spelling, capitalization, punctuation, and spacing exactly). You may assume the array’s length is at least 1 and the array has been populated with values. If the array contains the same value, so the min and max are the same, then assume that value is the min and max.

Solution Tests:
• Does the solution compile?
• Does the solution have your name in the comments?
• Does the solution have a high-level solution description (150-300 words) in the comments?
• If the array contains the values {10,4,6,8,2}, then does the program print out:

10-2=8

• If the array contains the values {5,4,3,2,1}, then does the program print out:

5-1=4

• If the array contains the values {2,2,2,2,2}, then does the program print out:

2-2=0
5. Write a program that multiplies all the values in an integer array and then prints out the result. The only information that should be printed is the result of the multiplied values. You may assume the array’s length is at least 1 and the array has been populated with values.

Solution Tests:
- Does the solution compile?
- Does the solution have your name in the comments?
- Does the solution have a high-level solution description (150-300 words) in the comments?
- If the array contains the values {2,4,6,8}, then does the program print out:
  384
- If the array contains the values {1,2,3,4,5}, then does the program print out:
  120
- If the array contains the values {-2,-2,2,-2}, then does the program print out:
  -32
6. Using the provided code, write a program that goes through an array and then changes every instance of an even number into a 0, and then prints out the resulting array. Each value should be separated by a single space (“ ”) in the printout. You may assume the array’s length is at least 1 and the array has been populated with values.

Solution Tests:
- Does the solution compile?
- Does the solution have your name in the comments?
- Does the solution have a high-level solution description (150-300 words) in the comments?
- If the array contains the values {1,2,3,4,5,6,7,8}, then does the program print out:
  
  1 0 3 0 5 0 7 0

- If the array contains the values {2,-2,2,-2,2}, then does the program print out:

  0 0 0 0 0

- If the array contains the values {1,3,5,7,9}, then does the program print out:

  1 3 5 7 9