Intro to Computer Science & Programming in Java

CSCD 210

CSEE Department, Eastern Washington University

Fall 2020

Your name:

Homework #2

Each question is worth 20 points.

1. **Body Mass Index (BMI)** is calculated by taking your weight in kilograms and dividing it by the square of your height in meters. (So, if you are 6'0'', that's about 1.83 meters.) Write a Java program that prompts the user to enter a weight in lbs. and height in inches, and then (after appropriately converting the units) displays the BMI. Consider 1 pound to be equal to 0.45359 kilos and 1 inch to be equal to 0.0254 meters. Include the output of your code for five combinations of (weight, height) in (pounds, inches).

2. A palindrome integer is one that "reads the same" from left to right and from right to left. So, for instance: 121, 12321 and 757 are all palindrome integers. Write a Java program that prompts a user to enter a 3-digit positive integer and determines whether it is a palindrome. Include the output of testing your code on the following input values: 171, 173, 747, 905 and 007.

3. Write a Java program that plays the kids' game rock-paper-scissors (RPS). Assume scissors win vs. paper, paper wins vs. rock and rock wins vs. scissors. The program randomly generates an int among values {0, 1, 2} representing scissors, rock, and paper, respectively. The program prompts the user to enter a value 0, 1 or 2 and then displays a message on who has won, based on the RPS game rules above. Should both the user and the program pick the same choice, the game is tied (i.e., nobody won).

Show the output of your game for five different choices of play (computer, user) where each of computer and user is one of 0, 1 or 2. (For example, (0, 1) means computer played rock and user played paper, so the user would win in that scenario.)

4. Write a Java program that prompts the user to enter a nonnegative integer and then determines whether that integer is divisible by i) 6 and 7, ii) 6 or 7 (one or both), and iii) by exactly one of 6 and 7, but not both. Test run your program on the following input values, and show the output in each case: 7, 18, 23, 42, 50.

5. Write a Java program that prompts the user to enter a hexadecimal number (single-digit, i.e., one of 0, 1, …, 9, A, B, C, D, E, F), converts it to a 4-digit binary number, and displays that binary value. For example, hex 7 is 0111 in binary and hex A is 1010 in binary. Hex digits that are represented as English letters can be either uppercase or lowercase (so, either 'A' or 'a' would stand for (decimal) 10). For an incorrect input (anything that's not a valid hexadecimal digit), your program should notify the user that the input was not valid. Make sure to use the char datatype.

   Show the output of your code for the following input values:
   9, f, 3, G, x