Computer Science Contest #1314-11 Key

January 25, 2014

1) A
2) D
3) E
4) B
5) A
6) D
7) A
8) E
9) D
10) C

11) C
12) E
13) B
14) A
15) D
16) C
17) E
18) B
19) D
20) A

21) B
22) A
23) C
24) D
25) B
26) D
27) B
28) E
29) A
30) C

31) A
32) C
33) A
34) B
35) B
36) C
37) E
38) B
39) D
40) C

Note to Graders:

- All provided code segments are intended to be syntactically correct, unless otherwise stated (e.g. error is an answer). **Ignore any typographical errors.**
- Any necessary Standard Java 2 Packages are assumed to have been imported as needed.
- Assume any undefined (undeclared) variables have been defined as used.

Explanations

1 $204_8 + 100010_2 = 132_{10} + 34_{10} = 166_{10}$. B, C, & D are all = 166_{10}. A = 174_{10}
2 3.2 x 2 = 6.4
3 3 * 3 = 9. D is incorrect because you are multiplying ints, so the answer must be an int
4 Loop carries through 1.0, 0.6, and 0.2.
5 wd starts at position 2, 3rd character starting at 0
6 new int[6] creates an array of length 6 with 0 in all slots
7 (true and false or true) and (true or false and true) are both true
8 Since there are no break commands, the code would continue from the matching case to the end and output the final three lines.
9 An int times a double results in a double, so 6.0 is the correct answer
10 The Chicken class does not have a constructor with a double parameter followed by an int parameter so choice C is not a valid option
11 3 × 2.5 = 7.0, Math.floor() returns a double so 7.0 is correct answer.
12 The loop is calculating the sum of all even members of the matrix;
13 \\ becomes single \, \b is backspace and removes the e, \" is single quote, \\ becomes a single \ and does not escape the next b, \t is tab, \' is single quote
14 %08.3f% is a total of 8 numbers with 3 after the decimal, padded to the left with zeros
15 i starts at 2, i *= i sets i to 4, then 16, then 256.
16 Loops through Hello Bob backwards and appends each character onto o
17 36 = b100100. Shifted 2 to the left is 10010000 = 144
18 true and false is false, and false or false is false; so the whole statement is false
19 lst.remove(2) removes and returns the element in position 2, in this case 3
20 int / int must be int; 39 / 4 is 9;
21 true or false and true is true, so method returns true;
22 true || false and false || true both return true so the only path through the code is the first if.
23
24 b is defined as a Chicken, so the talk method outputs "cluck"
25
26 Integer.MIN_VALUE = -2147483648. Absolute value is 2147483648 which is one higher than Integer.MAX_VALUE so it loops back around to -2147483648. It doesn't overflow.
27 Array is only sorted from positions 2-5 due to the 2nd and 3rd parameters. Remaining positions are unaffected.
28 I is correct; V is also correct because a number that's divisible by 2 and by 3 is also divisible by 6; IV is not correct because a negative int could have a negative remainder - -25 % 6 == -1 which would be true for that condition;
29 Sum needs to increase by i, so only sum += i is correct.
30
31 b010101 = 21dec, 21dec = 15hex
32
33 Only the first 3 are added. The 4th (s.add(1)) would be a duplicate and is not added to the set
34 Stack is [Howdy, Doody, 2, Chicken]. First peek() doesn't change stack. First pop() pulls Chicken off the top. Second pop() returns 2 which is at the top.
35
36 3 is the value in the map associated with key !
37 After 3 adds contents are 2, 3, 7. poll() removes the 2, leaving 3 in the head position
38 The algorithm rounds up to the next power of 2 which is 64
39 w == 1 is true, x <=2 is evaluated and also true, y != 3 is evaluated and false, so b is false
40 c is not correct because the + requires that there be an s, a ? doesn't.