Computer Science Contest #1415-02 Key

October 18, 2014

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

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

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

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

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 10010_2 = 18dec, 63_7 = 45dec, 18dec + 45dec = 63dec = 223_5
2 4*3 is 12, but since one is a double the answer has to be a double
3 x changes by 7 (3 + 4)
4 `Loops 5 times (i=0, 2, 4, 6, & 8)`
5 `indexOf is case sensitive, so b and B are different and indexOf returns -1`
6 Square of each position is put back into the array
7 Evaluates to true or true
8 x > 5 and x == 19 are true, so Hi and No both print. X < 20 is also true, but that condition isn't checked.
9 Order of operations, multiplication comes first
10 Has to be defined public and static to be callable without an instance from another class
11 II / 2 is about 1.57 radians; 1.57 radians is 90; toRadians returns a double;
12 Only I and IV are valid; II – No constructor with just a string; III – Falcon does not have an int, String constructor; V – can't store a Bird in a Falcon instance
13 You cannot assign weaker access privileges.
14 Math.random() return 0 – 0.99999, times 5 is 0-4.99999, plus 2 is 2-6.999999
15 A \n starts a new line, but a \\ becomes a single \ so \\n would not start a new line; there are only 3 \n without another \ in front
16 i starts at 5 and increases 3 each loop (+ 5 – 3 +1 = 3;
17 Code calculates the average, x is 51 at the end, 51 / 9 is 5 (int division)
18 The second parameter in indexOf tells it to start searching at that position so the a in spot 3 is skipped;
19 not true or not true or not false, same as false or false or true
20 100 % 7 = 2, 2 % 2 = 0
21 $175_8 = 125_{10}$ which is the largest of the numbers listed;
22 b is a reference to a so any changes to either affects the other
23 ArrayList.remove removes the first element that matches, so the first "Chicken"
24 Loop reverses the String, but only with characters in even positions
25 Code shifts the bits 3 to the right and then 3 to the left; this changes the last 3 bits to 0;
26 Must loop ones; x goes to 3 then 4, both true for the condition; and ends at 5
27 i becomes > 25 inside of q27_2 which then decrements and returns
28 This results in an else without an if Runtime exception
29 Both i>9 and i>=10 would return true for the same set of integers;
30 x values for each call of something are 8.0, 12.0, 18.0, 27.0, and 40.5. Ends with (int)(40.5 + 12) or 52;
31
32 Arrays.fill fills the entire array with 2s; each position is then replace with 2 * the i value in the loop;
33 Map is abstract and cannot be instantiated; Runtime Exception;
34 1101 shifted 6 bits to the right is 17. 17 in binary is 10001.
35 28/3 does = 9 (int math) so the ternary returns apple
36 getFirst returns the first element, but does not remove
37 Loop iterates 17 times as 1 bit is shifted off 100,000 each time
38 I doesn't work because it would match 32 digits but not the a-f, II wouldn't work because the match is case sensitive.
39 case 5 catches x and increments; because there's no break it falls through to the x++ under case 6
40 All converted to base ten – 27 + 65317 + 52 = 65396