Computer Science Contest #1112-06 Key

November 19, 2011

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

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

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

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

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.

Brief Explanations:

1. A0 = 160, 110001 = 49, 209 = 11010001.
2. m++ occurs after m is multiplied, but it is moot because m is assigned a new value after it is increase by one.
3. The range of the random number is [-10,2), where 2 is exclusive.
4. The print statement is outside of the loop and will print the first value that makes the loop false.
5. str.substring(9,7) will yield a index out of bounds error.
6. The only indicies being used are 0, 1, 2, 3, and 4 because of %5.
7. if a = false, then b must be true and if b = false, then a must be true. The shortest way to write this is a!=b.
8. an int/int yields an int. It does not round, it truncates. Also, break is not after case 4, so x will become the default value.
9. Do not choose %3 because the only values you would get is 0,1,or 2.
10. Returning an int does not indicate the core is depleated, so returning a boolean is a better choice. Further, passing a parameter named core up to the method does not guarantee that it is the same as the private core.
11. Math.pow(x,1/3.0); would have worked but it was not listed.
12. %x in printf takes an int and makes it a hexadecimal.
13. a \n means to go to the next line.
14. add up all the even numbers and subtract the odd numbers
15. -40 is not less than -61. Everyone makes this mistake at least once.
16. remember that Strings are immutable, so replaceAll doesn't change x and y.
17. 80>>3 = $80/2^3$ = 80/8 = 10 = 1010_2. 63 = 111111_2. 1010 & 111111 = 1010_2 = 10.
18. treat && as a * and || as a +, then you see you can distribute out the A.
19. make sure you pay close attention to what is an add, set, and remove.
20. remember that you are adding an int to a String so it stays a String.
21. eventually, substring(1,0) will be called and that gives the error.
22. the first conditional statement is true, and jumps out of the loop.
23. to get a grand slam, wait for a high fast ball. x has to be greater than 18 first, then y must exceed 4.
24. A subclass cannot instantiate its parent class.
25. A subclass does not have access to its parent's private instances.
26. it pulls from the back, and then it calls the parent class to return the value.
27. A complex way of doing a binary search tree.
28. a max heap's parent must be larger than it's children, visa versa for a min heap.
29. solving mystery(-1) solves m(0) solves m(1) solves m(2) solves m(3) solves m(4).
30. continue what you started on 29.
31. a merge sort is O(n log n) while the rest are no better than $O(n^2)$.
32. a max heap will have a parent value greater than the two child values.
33. peek looks at the top of the stack
34. the stack prints out from bottom to top in the toString() method.
35. you must check to make sure there is a top to peek at before you peek.
36. the next() method grabs the next value in the linked list
37. once an iterator is created for a linked list, that linked list cannot be alter and still use the same iterator. The iterator must be instantiated again.
38. << means * 2^x, so $28*2^4$
39. it must start with an a and end with a d, but anything goes in between
40. this splits on the s and the y.