

Answers and Solutions

SECTION I: MULTIPLE CHOICE

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|-------|-------|-------|-------|
| 1. D | 11. E | 21. E | 31. E |
| 2. B | 12. D | 22. C | 32. A |
| 3. C | 13. C | 23. E | 33. E |
| 4. A | 14. C | 24. E | 34. C |
| 5. D | 15. B | 25. C | 35. A |
| 6. B | 16. E | 26. E | 36. A |
| 7. A | 17. B | 27. A | 37. A |
| 8. A | 18. D | 28. B | 38. B |
| 9. B | 19. C | 29. D | 39. C |
| 10. D | 20. B | 30. E | 40. D |

Notes:

1. `len` is passed by value.
4. `Fun` can have a `compareTo` method but not implement `Comparable<Fun>`.
8. `url.substring(0, 0)` returns an empty string.
14. 4 times within each pair + 2 times within each quadruplet + 1 time at the top level.
15. $40 + 40$ to sort both halves + $0.01 * 2000 = 20$ to merge.
19. Superclass's `compareTo` will be called, which returns the difference in sizes, $2000 - 1800 = 200$.
20. Can't assign a `House` to a `HouseForSale`.
23. Use De Morgan's laws and note short-circuit evaluation.
25. When the bug cannot move, `act` calls `turn` twice, because `super.act` calls `turn`. It calls `turn` of the `SuperBug`, which overrides `turn` in `Bug`.
27. `ChameleonCriticter`'s default no-args constructor calls `Criticter`'s default no-args constructor, which in turn calls `Actor`'s constructor.
32. In II and III, a local variable `s` is modified but not the corresponding element of the list.
35. For Operation 3, finding both players in a sorted list (Design B) using binary searches takes less time than finding even the first player in Design I.
40. Option I is already guaranteed — no change is necessary for that.