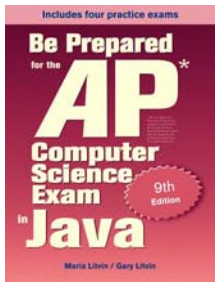

Ninth Edition

Be Prepared
for the
AP
Computer Science Exam in Java

Chapter 5: Annotated Solutions to Past Free-Response Questions

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www.skylit.com/beprepared/x2025all.zip contains complete Java code, including solutions and test programs for runnable projects.

The free-response questions for this exam are posted on AP Central:
https://apcentral.collegeboard.org/courses/ap-computer-science-a/exam/past-exam-questions

Scoring guidelines for teachers are usually posted over the summer.

Question 1

Part (a)

```
public int walkDogs(int hour)
{
  int numWalked = Math.min(maxDogs,
                           company.numAvailableDogs(hour)); [1]
  company.updateDogs(hour, numWalked);
  return numWalked;
}
```

Notes:

1. Or, to stay within the Quick Reference:

```
int numWalked = company.numAvailableDogs(hour);
if (numWalked > maxDogs)
  numWalked = maxDogs;
```

Part (b)

```
public int dogWalkShift(int startHour, int endHour)
{
  int totalPay = 0;

  for (int hour = startHour; hour <= endHour; hour++)
  {
    int numWalked = walkDogs(hour);
    totalPay += 5*numWalked;
    if (numWalked == maxDogs || (hour >= 9 && hour <= 17)) [1]
      totalPay += 3;
  }
  return totalPay;
}
```

Notes:

1. The set of parentheses around the `&&` expression is optional.

Question 2

```
public class SignedText
{
  private String firstName, lastName;

  public SignedText(String first, String last)
  {
    firstName = first;
    lastName = last;
  }

  public String getSignature()
  {
    if (firstName.length() == 0) [1]
      return lastName;
    else
      return firstName.substring(0, 1) + "-" + lastName; [2]
  } [3]

  public String addSignature(String text)
  {
    String sig = getSignature();

    int pos = text.indexOf(sig);
    if (pos == -1)
      return text + sig;
    else if (pos > 0) [4]
      return text;
    else
      return text.substring(sig.length()) + sig;
  }
}
```

Notes:

1. Or:
   `if (firstName.equals(""))`
2. `firstName.charAt(0)` instead of `firstName.substring(0, 1)` would earn full credit.
3. In an alternative solution, the signature would be calculated in the constructor and saved in an instance variable; the `getSignature` method would just return that value.
4. The question states that the signature occurs at the beginning or at the end of `text` — it cannot be in the middle.

Question 3

Part (a)

```
public Round(String[] names)
{
  competitorList = new ArrayList<Competitor>();

  for (int i = 0; i < names.length; i++)
    competitorList.add(new Competitor(names[i], i+1));
}
```

Part (b)

```
public ArrayList<Match> buildMatches()
{
  ArrayList<Match> matches = new ArrayList<Match>();

  int i = 0;
  if (competitorList.size() % 2 == 1)
    i = 1; [1]

  int j = competitorList.size() - 1;

  while (i < j)
  {
    matches.add(new Match(competitorList.get(i),
                          competitorList.get(j)));
    i++;
    j--;
  }

  return matches;
}
```

Notes:

1. Or:

```
int i = competitorList.size() % 2;
```

Question 4

Part (a)

```
public SumOrSameGame(int numRows, int numCols)
{
  puzzle = new int[numRows][numCols];

  for (int r = 0; r < numRows; r++)
  {
    for (int c = 0; c < numCols; c++)
    {
      puzzle[r][c] = (int)(9*Math.random()) + 1;
    }
  }
}
```

Part (b)

```
public boolean clearPair(int row, int col)
{
  for (int r = row; r < puzzle.length; r++)
  {
    for (int c = 0; c < puzzle[0].length; c++)
    {
      if ((r != row || c != col) [1]
          && (puzzle[row][col] == puzzle[r][c] ||
              puzzle[row][col] + puzzle[r][c] == 10))
      {
        puzzle[row][col] = 0;
        puzzle[r][c] = 0;
        return true;
      }
    }
  }
  return false;
}
```

Notes:

1. It is important not to compare the element of `puzzle` to itself.