

# SAT: Code Coverage

Consider the following piece of code, which plays a game of Blackjack:

```
1 public int play(int left, int right) {  
2     int ln = left;  
3     int rn = right;  
4     if (ln > 21)  
5         ln = 0;  
6     if (rn > 21)  
7         rn = 0;  
8     if (ln > rn)  
9         return ln;  
10    else  
11        return rn;  
12 }
```

1. What is the minimum number of tests needed for 100%:
  - a) ... line coverage?      ... branch coverage?
  - b) ... branch+condition coverage?      ... path coverage?
2. You have written only one test where left=22 and right=21.
  - a) What is the line coverage?
  - b) What is the branch coverage?
  - c) What is the branch+condition coverage?
  - d) What is the path coverage?

**Note:** You may draw the control flow diagram to reason about the different coverage criterion.

Consider the following method:

```
1 public String sameEnds(String string) {
2     int length = string.length();
3     int half = length / 2;
4     String left = "";
5     String right = "";
6     int size = 0;
7     for (int i = 0; i < half; i++) {
8         left = left + string.charAt(i);
9         right = string.charAt(length - 1 - i) + right;
10        if (left.equals(right)) {
11            size = left.length();
12        }
13    }
14    return string.substring(0, size);
15 }
```

3. What is the minimum number of tests needed for 100%:

- a) ... line coverage?      ... branch coverage?
- b) ... branch+condition coverage?      ... path coverage?

4. How many tests are needed to satisfy the *loop boundary adequacy criterion*? What are these tests? Give concrete examples.

**Note:** You may draw the control flow diagram to reason about the different coverage criterion.