

# SAT: Property-based Testing

1. Write property-based tests for the following procedure:

```
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 }
```

2. Write property-based tests for the following procedure:

```
1 public static boolean isLeapYear(int year) {
2     if (year % 400 == 0)
3         return true;
4     if (year % 100 == 0)
5         return false;
6     return year % 4 == 0;
7 }
```

3. Write property-based tests for the following procedure:

```
1  public enum TYPE {
2      NONE,
3      SCALENE,
4      ISOSCELES,
5      EQUILATERAL
6  }
7
8  public static TYPE checkTriangle(int s1, int s2, int s3) {
9      if (!isValidTriangle(s1, s2, s3))
10         return TYPE.NONE;
11     else if (isEquilateral(s1, s2, s3))
12         return TYPE.EQUILATERAL;
13     else if (isIsosceles(s1, s2, s3))
14         return TYPE.ISOSCELES;
15     else
16         return TYPE.SCALENE;
17 }
18 public static boolean isValidTriangle(int a, int b, int c) {
19     return (a + b > c && b + c > a && c + a > b);
20 }
21 public static boolean isEquilateral(int a, int b, int c) {
22     return (a == b && b == c);
23 }
24 public static boolean isIsosceles(int a, int b, int c) {
25     return (a == b || b == c || a == c);
26 }
```