SAT: Specification-based Testing

1. A game has the following condition: `numberOfPoints <= 570`. Perform boundary analysis on the condition. What are the on and off points?

```
on point 570
off point 1000
```

2. Perform boundary analysis on the following equality: `x == 10`. What are the on and off points?

```
on point 10
off point 9 and 11
```

3. A program called FizzBuzz does the following: given an integer n, return the string formed from the number followed by "!". If the number is divisible by 3, use "Fizz" instead of the number; and if the number is divisible by 5, use "Buzz" instead of the number, and if the number is divisible by both 3 and 5, use "Fizz- Buzz" instead of the number. What is a good test suite and why?

```
see answer key for lab 4
```

4. How many parameters should be considered when designing specification-based tests for the following code snippet? What is a good test suite and why?

```
/**
  * Puts the supplied value into the Map,
  * mapped by the supplied key.
  * If the key is already in the map, its
  * value will be replaced by the new value.
  *
  * NOTE: Nulls are not accepted as keys;
  *  a RuntimeException is thrown when key is null.
  *
  * @param key the key used to locate the value
  * @param value the value to be stored in the HashMap
  * @return the prior mapping of the key,
  *  or null if there was none.
 */
 public V put(K key, V value) {
   // implementation here
 }
```

```
Parameters (3): the implicit object parameter (map), key and value
Partitions:
- map:
empty map
has one element
has multiple elements
- key
null
not in map
key in map
- value
null
non-null
-outcomes
1.RuntimeException
2.Add a new (key,value) pair
3.Update the value of an existing key
Boundaries:
between 1 and 2
between 2 and 3
Testcases (String,String)
start with an empty map, key = "1", value = "one" -> {"1":"one"}
{"1":"one"}, key = null, value = "null" -> RuntimeException
{"1":"one"}, key = "2", value = null -> {"1":"one", "2":null}
{"1":"one", "2":null}, key = "2", value = "two" -> {"1":"one", "2":"two"}
```

5. Postal codes in some imaginary country are always composed of four numbers and two letters: for example, 2628CD. Numbers are in the range [1000, 4000]. Letters are in the range [C, M]. Consider a program that receives two inputs—an integer (for the four numbers) and a string (for the two letters)—and returns true (valid postal code) or false (invalid postal code). What is a good test suite and why?

```
see answer key for lab 4
```