Aviel Resnick

13.5 Problem Set

Exercise 7.7:

1. Write appropriate input assertions and output assertions for the following loops.

a. score = reader.nextInt();

while (score != -999) {

numScores = numScores + 1;

sum = sum + score;

System.out.print(“Enter a score; -999 to quit: “);

score = reader.nextInt();

}

b. count = 0;

power2 = 1;

while (power2 < 100) {

System.out.println(power2);

power2 = power2 \* 2;

count = count + 1;

}

For A:

- INPUT: Assert sum != -999;

- OUTPUT: Assert sum >= score;

For B:

- INPUT: Assert power2 == 1; Assert count == 0;

- OUTPUT: Assert power2 == Math.pow(2, count);

2. Write appropriate loop invariant and loop variant assertions for each of the loops in

Question 1 above.

a.

- INVARIANT: sum is the sum of all previous values

VARIANT: numScore increases by 1, sum increases by score

b.

- INVARIANT: power2 == Math.pow(2, count)

VARIANT: power2 grows exponentially, count increments by 1

Exercise 7.8:

1. Indicate the outputs of the following code segments.

a. String str = "The rain in Spain falls mainly on the plain";

System.out.println(str.indexOf(' '));

- Output: 3

b. String str = "The rain in Spain falls mainly on the plain";

System.out.println(str.indexOf(' ', 4));

- Output: 8

c. String str = "The rain in Spain falls mainly on the plain";

System.out.println(str.substring(4));

- Output: rain in Spain falls mainly on the plain

d. String str = "The rain in Spain falls mainly on the plain";

System.out.println(str.substring(4, 8));

- Output: rain

e. String str = "The rain in Spain falls mainly on the plain";

int begin = 0;

while (begin < str.length()) {

int end = str.indexOf(' ', begin);

if (end == -1)

end = str.length();

String word = str.substring(begin, end);

System.out.println(word);

begin = end + 1;

}

- Output:

The

rain

in

spain

falls

mainly

on

the

plain