SWE 3643 – Homework 5

by: Kevin Nolan

Part 1

A.) if (x < 12 || (r – 3 > 12))

Valid Mutants

1. if(x == 12 || (r-3 > 12)) **[ROR]**
2. if(x < 12 || (r + 3 > 12)) **[AOR]**
3. if(x < 12 && (r - 3> 12)) **[COR]**

Invalid Mutants

1. if (x **=** 12 || (r – 3 > 12)) **[ROR]**
2. if(x < 12 **>** (r – 3 > 12)) **[COR]**
3. if(x < 12 || (r – 3 **>** "cookie")) **[SVR]**

B.) ROOT ::= SUB1 SUB2 | SUB2 SUB1 | SUB1 | SUB2
SUB1 ::= "1" | "3" | "5" | "7" | "9"
SUB2 ::= "K" | "S" | "U" | "P"

1.) How many unique non-terminal symbols?

Root,Sub1 and Sub2 are all non-terminal symbols so there are 3.

2.) How many unique terminal symbols?

1,3,5,7,9 and K,S,U,P are all terminal symbols so there are 9.

3.) Example of a valid string and an invalid string?

Valid String

Root -> Sub1Sub2 -> "3" Sub2 -> "3" "U" -> 3 P

Invalid String

KSU -> SUB2 SUB2 SUB2 != any terminals in Root so invalid string!

Part 2

A.) **Six Mutant Lines of Code:**

1. if (right > 0) **[changed == to >]**
   {
   rslt = 1;
   }

2. for (int i = 2; i >= right; i++) **[changed <= to >=]**
   {
   rslt = rslt * left;
   }

3. rslt = right; **[changed variable from left to right]**

4. for (int i = 2; i <= right; i++) **[changed rslt = to left =]**
   {
   left = rslt * left;
   }

5. if (right == 0) **[changed rslt = 1 to +=1]**
   {
   rslt += 1;
   }

6. for (int i = 2; i <= right; i++) **[changed rslt * left to +]**
   {
   rslt = rslt + left;
   }