17-355/17-655/17-819: Program Analysis
Lecture 19, Concolic Testing
In-Class Exercises
April 2, 2019 **Andrew ID: _____**

1. Use concolic testing to find the error. Show each of your test cases and the path condition used to generate the test case (this will be "true" for the first test).

```
void bar(x,y,z)
  if (x > 3 * y + 1) {
    if (x * x == z - 2) {
      ERROR
    }
  }
```

2. Sometimes it's hard to solve for a variable in a path condition because doing so would require inverting a function that is not easily invertible (such as cryptography or even multiplication by something that's not a constant). Which of the following examples are likely too hard for a concolic tester? For those that not too hard, how could a testing tool solve the path condition?

```
void foo(x,y)
  if (x == crypt(y))
    ERROR
  else
    return x
```

```
void foo(x,y)
  if (crypt(x) == crypt(y))
    ERROR
  else
    return x
```

```
void foo(y)
  if (10 == crypt(y))
    ERROR
  else
    return x
```

```
void foo(x,y,z)
  if (x*x == crypt(y) + z)
    ERROR
  else
    return x
```