**CS 211 HW 3 – Sang Park**

A number x with a ten’s digit and a one’s digit can be written as 10a + b, where a is the ten’s digit and b is the one’s digit. A perfect square would be x \* x. If we substitute 10a + b and distribute, we get 100a^2 + 20ab + b^2. Now we analyze this formula. Any perfect square must fit this formula. For any integer a, 100a^2 must be a number whose ten’s and one’s digits are both 0. For any integer a and b, 20ab will be an even number in both the ten’s and the one’s digit. Now that we know that the first two terms are even, b^2 is the only term that can possibly be odd and in order for the one’s digit of b^2 to be odd, b must be 1, 2, 5, 7, or 9, which all produce an even ten’s digit. Because the ten’s digit can never be odd for an odd one’s digit, the program will run for an infinite amount of time.