Wu, Jiao 2/3/2015 Assignment 3 perfect square-prove the computation time estimate.

1^2=1

2^2=2

3^2=9

4^2=16

5^2=25

6^2=36

7^2=49

8^2=64

9^2=81

Among square of one digit number, there is no perfect square whose last two digits are both odd.

In order to find out whether there is perfect square of two digit number whose last two digits are both odd, we express two digit number as (10a+b).

So perfect square of two digit number = (10a+b)^2

If b^2≤9, then (10a+b)^2=(10a)^2+20ab+b^2, since b^2≤9, b^2 does not influence the tens digit and (10a)^2 also does not influence the last two digits. So the tens digit will be always even because of 20ab term.

Next, (10a+4)^2=(10a)^2+80a+16. Since the last digit is always 6, the last two digits of (10a+4)^2 are not both odd.

(10a+5)^2=(10a)^2+100a+25, the last two digits of this square will be always 25.

(10a+6)^2=(10a)^2+120a+36, the last digit is always 6.

(10a+7)^2=(10a)^2+140a+49, the tens digit is always even.

(10a+8)^2=(10a)^2+160a+64, the last digit is always 4.

(10a+9)^2=(10a)^2+180a+81, the tens digit is always even.

Therefore, among perfect square of two digits number, there is no perfect square whose last two digits are both odd.

If the number is three digit number, the three digit number is expressed as “abc”

(abc)^2 =( a\*100+bc)^2=(100a)^2+200abc+(bc)^2

Because (100a)^2 and 200abc do not influence the last two digits, so the last two digit depends on (bc)^2.

Since we already proved there was not perfect square whose last two digits are both odd among (bc)^2. Therefore, among perfect square of three digit number, there is also no perfect square whose last two digits are both odd.

Likewise, the last two digits of the perfect square of any number with more than three digits depends on the perfect square of the last two digits of these numbers. For example, abcd is the four digit number. The last two digits of (abcd)^2 depends on (cd)^2. Thus, there is no perfect square whose last two digits are both odd among.

Together, the program will be run for infinite time.