Programming Code:

/\*

\* Fermat's Last Theorem - Near Miss

\* File Holding the Program: PossibleSmallestMiss

\*

\* Programmers Names:

\* 1. Shivasai Priyatham Kota(ShivasaiPriyathamK@lewisu.edu)

\* 2. Akshitha Prasad Thakur (AkshithaPrasadThak@lewisu.edu)

\*

\* Course: FA22-CPSC-60500-004

\*

\* November 20, 2022

\*

\* Explanation: first of all setting he upper and lower limit of k, and according to that limit range, x and y values are generating according to the k vallue. Value of n is randomly generating with in

\* the limit 2<n<12. then according to the method of finding the near miss, we followed the method the equation and calculating the near miss vlue, and at the end also finding the nearest miss.

\*

\* Resources: Youtube video to understand the concept of the theorem. https://www.youtube.com/watch?v=ReOQ300AcSU

\*

\*/

**import** java.util.Scanner;

**import** java.lang.Math;

**import** java.util.Random;

**public** **class** PossibleSmallestMiss {

//Main Function to compute the results

**public** **static** **void** main(String[] args)

{

**int** x=0;

**int** y = 0;

**int** z = 0;

**int** n = 0;

// This lower limit is for K variable

**int** lower\_limit = 10;

// THis upper limit is for variable K

**int** upper\_limit = 42;

Scanner userinput = **new** Scanner(System.***in***);

//Here taking user input, to solve the equations multiple times, and how many times it will solve, this we are taking from user

System.***out***.print("Please Enter the number of how many times you want to run the program = ");

**int** count = userinput.nextInt();

**double** smallestmiss = 99999999.99;

//for loop will execute count times, and will compute the near miss count times

**for** (**int** i =0; i<count; i++)

{

x = (**int**) ((Math.*random*() \* (upper\_limit - lower\_limit)) + lower\_limit);

y = (**int**) ((Math.*random*() \* (upper\_limit - lower\_limit)) + lower\_limit);

n = (**int**) ((Math.*random*() \* (11 - 3)) + 3);

System.***out***.print("The Value of x = " + x + "\n");

System.***out***.print("The Value of y = " + y + "\n");

System.***out***.print("The Value of n = " + n + "\n");

//x^n + y^n

**int** xnplusyn = (**int**)((Math.*pow* (x, n))+(Math.*pow* (y, n)));

//To make the equation in the form of fermat's equation as mentioned in instructions we are taking nth root

z = (**int**) Math.*pow* (xnplusyn, 1.0/n);

//if we subtract z power n from sum of x power of n and y of power of n we get the near miss value

**int** nearmiss = (**int**)(xnplusyn - Math.*pow* (z, n));

//By following the instructions how can we find the relative miss, applying same thing here to find out the relative miss

**double** relativemiss = 100. \* nearmiss / xnplusyn;

System.***out***.println("\n\nNear Miss = "+nearmiss+" \nRelative Miss = "+relativemiss);

//to find out the smallest possible miss, comparing relative miss with smallest miss

**if**(relativemiss<smallestmiss)

{

smallestmiss=relativemiss;

}

System.***out***.println("Smallest Possible Miss = "+smallestmiss);

System.***out***.println("\n");

}

}

}

Output:

