**Fermat's Last Theorem Near Misses Finder**

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**Introduction**

A Python program called the Fermat's Last Theorem Near Misses Finder enables users to look for "near misses" in the equation 'xn + yn = zn'. It aids in the investigation of the relationships between the positive integers (x, y, z, n, k) where "2 n 12," "10 = x = k," and "10 = y = k." A near miss is described as a very slight deviation between "(xn + yn)" and "zn." A binary search technique is employed by the program to systematically locate x, y, and z combinations that are "almost right." It determines "(xn + yn)" for each feasible x, y combination and then searches for whole integers "z" and "(z + 1)" that "bracket" "(xn + yn)" such that "zn (xn + yn) (z + 1)n". The "miss" is then chosen as the smaller of these two values: "[(z + 1)n - (x + y + n)" or "[(z + 1)n - (x + y + n)". The relative magnitude of the miss is calculated by dividing the miss by "(xn + yn)". The program shows the appropriate x, y, and z coordinates, the actual miss, the relative miss, and the least relative miss so far found on the screen. The application publishes the output with the least miss as the end result after all combinations have been tested.

**How to Use**

1. Make sure you have Python installed on your computer.
2. Download or clone the repository to your local machine.
3. Open a terminal or command prompt and navigate to the folder containing the `fermat\_near\_misses.py` file.
4. Run the program by executing the following command: *python fermat\_near\_misses.py*
5. Follow the prompts to enter the values of `n` and `k`.
6. The program will display the results, including the smallest relative miss.

**Requirements**

* Python 3.x

**Installation**

1. Make sure you have Python 3.x installed on your computer.
2. Download or clone the repository to your local machine.

**Contact**

For any questions or suggestions, please feel free to contact us:

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