# Understanding the Problem:

## Functional requirements of the program:

1. The program should first read the dataset into Python.
2. Next, the user should be prompted to input an energy type from a list of options.
3. Using the dataset, the total increase in world power generation from 2000 to 2021 should be calculated.
4. The program should compute the fraction of total world energy produced from the chosen energy type in 2000 and 2021.
5. Lastly, the program should print the results.

## Assumptions:

1. It is assumed that the user will input a valid energy type from the list provided.

## Inputs:

1. Energy type chosen by the user.

## Outputs:

1. Total world power consumption in 2000 and 2021.
2. Percentage increase in world power generation from 2000 to 2021.
3. Fraction of world energy produced from the chosen energy type in 2000 and 2021.

# Devise a Plan:

## Decisions:

There were no decisions made in the development of this program, as it consists of sequential steps only.

## Sequence of steps:

1. Reading the dataset into Python.
2. Displaying to the user a list of the possible energy types.
3. Getting the user input for energy type.
4. Validating user input and in case of invalid input, the code should handle them.
5. Calculating from the dataset the world power consumption in 2000 and 2021 using defined functions.
6. Calculating the total increase in world power generation from 2000 to 2021.
7. Using defined functions to compute the fraction of total world energy produced from the chosen energy type in 2000 and 2021.
8. Printing the results.

## Calculating power use and total power used by the world:

1. Using the defined function, we can find the power for a given year and energy type.
2. Similarly, we can find the total world power for a given year.
3. By dividing the two values, we can find the fraction of world energy produced from the chosen energy type.

## Handling bad input:

1. The code needs to check whether the user input is in the list of energy types.
2. If not, the user should be prompted to enter an input again.

## Pseudocode:

1. Reading the dataset into Python.
2. Displaying to the user a list of energy types.
3. Prompting the user to input the energy type.
4. WHILE the input is not in the list of energy types, ask the user again for input.
5. Calculating the total increase in world power generation from 2000 to 2021.
6. Calculating the fraction of total world energy produced from the chosen energy type in 2000 and 2021.
7. Printing the results.

## Expected results:

In case of appropriate input by the user:

1. The program is expected to display the total world power consumption in 2000 and 2021.
2. The program is expected to output the percentage increase in world power generation over 20 years from 2000 to 2021.
3. The program is expected to output the fraction of world energy produced from the chosen energy type in 2000 and 2021.

In case of inappropriate input by the user:

1. Keep asking the user to input until the value belongs to the list of possible energy types.

## Other anticipated errors:

1. The user input is not handled properly, leading to errors.
2. Possible issues with the dataset, such as missing values…