Programming Exam 1

Date/Time: 2024.03.12 08:10 – 09:00
(程式檔命名學號_**quiz1.py**，上傳至 Moodle PE1 上傳區)

Problem: Richter Scale Conversion

This problem aims at letting you practice using *print* and *input* functions, along with simple *mathematics* for conversion, especially for *floating point* values. You are asked to write a program to display information about the energy released by earthquakes. Given the Richter scale measurements, your program needs to perform the appropriate calculations and display the equivalent amount of energy in joules, in tons of exploded TNT, and the number of nutritious lunches (營養午餐).

The Richter scale is a way to quantify the magnitude of an earthquake using a base-10 logarithmic scale. The magnitude is defined as the logarithm of the ratio of the amplitude of waves measured by a seismograph to an arbitrarily small amplitude. An earthquake that measures 5.0 on the Richter scale has a shaking amplitude 10 times larger than one that measures 4.0, and corresponds to a 31.6 times larger release of energy. We can calculate the energy in Joules released for a particular Richter scale measurement by the following equation:

$$energy = 10^{(1.5 \times richter) + 4.8}$$

where $energy$ is measured in Joules and $richter$ is the Richter scale measurement, which is a floating point number ranging from 1 to 10.

One ton of exploded TNT yields 4.184×10^9 Joules. One nutritious lunch contains 2930200 Joules. Therefore, you can further convert the energy released in Joules to tons of exploded TNT and the number of nutritious lunches.

Your program will prompt the user to enter a Richter scale measurement, accept a floating point value representing that Richter scale measurement, perform the appropriate calculations, and display the equivalent amount of energy in joules, in tons of exploded TNT, and the number of nutritious lunches.

Sample Input/Output   (以下是你的程式在執行後所必須列印出來的東西)
Please input a Richter scale value: 6.2
Richter scale value: 6.2
Equivalence in Joules: 125892541179417.14062
Equivalence in tons of TNT: 30089.03948
Equivalence in the number of nutritious lunches: 42963804.92097

助教在批改時，會用 python pe1.py 來執行你的程式，你的程式在被執行後，必須先停在 Please input a Richter scale value:，讓助教可以輸入芮氏規模，譬如以下截圖表示助教輸入 6.2。接著才會根據輸入的芮氏規模，列印出後面四行結果，也就是芮氏規模 6.2、等同於多少 Joules、多少噸 TNT、多少份營養午餐。

(繳交是交 pe1.py 檔，不是交截圖)

Note: You are required to write comments (註解) for each part in your code.

```
c:\Python35-32\workspace>python pe1.py
Please input a Richter scale value: 6.2
Richter scale value: 6.2
Equivalence in Joules: 125892541179417.14062
Equivalence in tons of TNT: 30089.03948
Equivalence in the number of nutritious lunches: 42963804.92097
```