Programming task : "Greener & Cleaner"

1. Read the scenario shown below and the example paper-based calculator on the next page.

Scenario

Greener and Cleaner is an environmental group who are trying to raise people's awareness of climate change and take responsibility for their own carbon footprint.

A carbon footprint measures how much carbon dioxide (CO_2) a person produces just by going about their daily life. Travelling to work or taking a holiday flight both rely on the combustion of fossil fuels like oil, coal and gas. When fossil fuels burn, they give off greenhouse gases such as CO_2 that may contribute to climate change. It is thought that ninety-eight percent of atmospheric CO_2 comes from the combustion of fossil fuels.

Greener and Cleaner is keen for people to realise how much CO_2 they contribute to climate change. However, it is quite complicated to carry out the calculations required to arrive at a personal total. They have also realised that people often want to find out what small improvements in their life style can do to improve their carbon footprint.

The group has produced a leaflet covering transport that people can use to calculate their annual transport score in kilograms of CO_2 equivalent. However, many people find the calculations tedious and some lack the number skills needed to do their own calculations.

Greener and Cleaner has decided that more people would calculate their carbon footprint if the process was easier. They hope that by providing a simpler system more people may take responsibility for their carbon emissions.

You have been commissioned by Greener and Cleaner to create a carbon footprint calculator that can be used on an individual's computer which will:

- allow an individual to input details of their current transport use

- calculate their annual transport score

- output the breakdown of their current annual transport score

- allow storage of results

- recall stored results and show the effect of changes.

Credit will be given for the quality of your solution.

Example carbon footprint calculator

Greener and Cleaner
Calculating your Carbon Footprint

How big is your carbon footprint? How could you reduce your greenhouse gas emissions?

This leaflet is designed to let you calculate your transport related carbon footprint.

Transport

a. If you are a regular car user please start with an annual score of:

- For very low mileage drivers (up to 5,000 miles/year)   2075kg

- For typical drivers (up to 10,000 miles/year)   4150kg

- For high mileage drivers (up to 15,000 miles/year)   6200kg

- For very high mileage drivers (more than 15,000 miles/year)   8300kg

If most of your trips are below 3 miles add 25% (extra fuel for cold starts).
If you drive a large car such as a 4 x 4 or people carrier add 50% to your figure so far. If you drive a small car subtract a third.

b. If you use public transport make a calculation based on the fact that a weekly 150 miles by rail or bus produces an annual 700kg.

c. For each hour you spent flying in the last year add 350kg.

Your annual transport score (a + b + c) in kg CO_2 equivalent [ ]

What you need to do

Create a programmed solution to this problem using the Python programming language, that deals with as many of these criteria from the scenario as you can.

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