Eco tracker

By Peter Lee

This eco tracker is a program I have made to allow people to keep track of their daily actions and calculate the amount of carbon emission as well as the amount of carbon prevented from emission. I have decided to develop this program due to the weather getting significantly getting hotter and hotter. After learning about greenhouse effect and how carbon emission greatly affects the weather, leading to not only hot weather, but in many other extreme ways as well, causing natural disasters in some cases. From this I have realised how serious the problem is. With the purpose of reducing the amount of carbon emission, I started to develop this.

Greenhouse gas emissions are one of the biggest reasons for the climate change. Just from burning organic materials, paper, fuel, plastic, etc.., carbon dioxide, which is one of the largest occurring greenhouse gas, can be released from combustion. It contributes to climate change due to greenhouse effect, which is an effect which the greenhouse gas in the atmosphere trap the heat from the sun within the earth’s atmosphere more than the earth is supposed to. This leads to global warming, a phenomenon where the average temperature of the earth getting hotter. Global warming does not only affect people, but the nature as well. Global warming ruins the natural environment, destroying wild animals’ habitats, therefore it has many other negative side effects.

This program will allow the user to input their actions throughout the day, which the program will calculate the amount of carbon emitted from the actions and record it for the user to see. For example, when a user has driven a car for 5 kilometres, the user could input the information that he has ridden a car for 5 kilometres, and the program will fetch the data for the amount of carbon emission per car ride of 1km and calculate using the data to find out the carbon emission for 5km car ride and save the data. Then the user will be able to view the data in the total amount of carbon emitted and saved throughout the day. The user can also set a time range to view the total amount of carbon emitted and saved throughout the time range, carbon emitted and saved for each action throught the time range, as well as a graph to visualise the data.

For the development of this program, I used a python library called streamlit, which is a python library that allows the development of websites using the programming language python. It allows the development of simple web programs, however has a limited functionality, one of them being a lack of customisation when using the streamlit only. Due to its lack of compatibility I have used pandas and plotly. Pandas is a python library which allows the programmers to easily make databases and save them by creating files, allowing the program to save previous user records. And plotly allows more dynamic graphs.

Since this program has the purpose of encouraging the users to reduce carbon emission into the atmosphere, the program doesn’t only track the users’ carbon emission. I have added a section which describes about global warming for education and why it is important to reduce carbon emission to encourage them to do so. Not only that, I have implemented some video game features, which are the goal system and the virtual forest. The goal system is straightforward, which the user can set a goal and the program will motivate the user to achieve the goal by putting a visual progress bar. The virtual forest is a system which creates a virtual tree every time the user reaches a certain amount of carbon saved, and by showing a visual representation of it, it encourages the user to reduce their carbon emission.

Throughout the experience of making this software, I have learnt more about program development, especially web development since this was my first time making a web software. I feel like the programming was not very difficult since I was used to the python language. However learning new libraries were a bit of a struggle, especially when it came to pandas and how it works with databases. However I feel like there are quite some aspects that can be improved in the program.

Overall, this was a very meaningful experience to me getting to learn about web development. This allowed me to become able to make more web programs in the future.