OOPP Group 20

How we calculate the points given. Every kg of CO2 saved is equal to 10 points.

**Taking the bike instead of the car:**

According to source 1 a liter of petrol takes about 2.392 kg CO2/L. If we then look at the average petrol consumption of cars in the netherlands it is about 6.7 L/100 Km right now according to source 2. If we combine these 2 values we find out that per Km of driving an average car, you consume about 0.19 kg CO2. If you were to take the bike instead of the car this would mean you were to save 0.19 kg CO2/Km.

**Eating a vegan meal:**

So because there are degrees to eating vegan (some meat, a lot of meat) we decided to add a slider for people to set their 'level' vegan skills. The lowest meaning there is no meat, and the highest meaning a lot of meat, which we interpret as 400 grams of meat. We looked at source 3 and decided to take the weighted average of these values, after all chicken for example is more popular than lamb is. The weighted average would be about 15 kg CO2/kg. We will assume a regular meal contains about 200 grams of meat. This would mean that a completely vegan meal saves you 3 kg CO2, and thus nets you 3 points.

**Taking the public transport:**

According to source 4, we changed the values to match the metric system. The bus would give us a value of 0.18 Kg CO2/Km, the train 0 Kg CO2/Km (source 11) and lastly the tram about 0.10 Kg CO2/Km. Taking the weighted average of these values gives us about 0.08 Kg CO2/Km. Compared to the car from before we see that you save 0.11 Kg CO2/Km by taking the public transport.

**Local produce:**

In the Netherlands we get our produce from all over the world. Some apples we fly in from Chili, some produce comes from Spain and so on. Most produce however does come from other European countries. Source 5 shows us some examples. As produce isn't conservable for a long time it is usually transported by planes as this is the fastest method. In source 7 it is mentioned that flying produce costs us about 0.997903 Kg CO2/Kg per pound. Convert that to kg and we get roughly 2.2 Kg CO2/Kg of produce. However this is over a disctance of 2500 miles, converted to about 2500 Km, which is more realistic given the distance our produce flies through europe, this would come down to about 1.4 Kg CO2/Kg. This means that per Kg of local produce you buy you'd get 1.4 points.

**Lowering temp:**

We will ask users what temperature they had their thermostat on before and after. According to source 10, a chance of 1 degree results in 453 Kg/year. This is about 1.24 Kg/day. So for example if a user lowers their temp by 4 degrees today they will be awarded with about 5 points in total.

**Solar panels:**

In source 9 we find that, on average a you save 1.2 lbs per kWh the solar panel generates. The reason we award players a large amount of points in 1 action is because we really do want to give players an incentive/reason to get solar panels. Out of all the activities you could argue that solar panels are the best in the long run. For this reason we give the players a year's worth of points. Since we give people a year worth of points we calculate 24\*365\*0.6 to get the points recieved by the player.

Source 1: <http://ecoscore.be/nl/info/ecoscore/co2>

Source 2: <https://www.autoweek.nl/verbruiksmonitor/>

Source 3: <http://www.greeneatz.com/foods-carbon-footprint.html>

Source 4: <http://blog.transitscreen.com/how-public-transit-can-and-must-help-reduce-carbon-pollution>

Source 5: <https://studylibnl.com/doc/1195480/waar-komt-ons-groente-en-fruit-vandaan%3F>

Source 6: <https://www.terrapass.com/eat-your-way-to-a-smaller-carbon-footprint>

Source 7: <https://www.energuide.be/en/questions-answers/how-much-co2-does-my-home-emit/68/>

srouce 8: <https://www.energids.be/nl/vraag-antwoord/hoeveel-co2-stoot-mijn-woning-uit/68/>

Source 9: <https://tennesseesolarsolutions.com/how-much-co2-does-a-typical-solar-electric-array-offset/>

Source 10: <https://www.clackamas.us/sustainability/tips.html>

Source 11: <https://www.nrc.nl/nieuws/2017/06/28/de-ns-rijdt-voor-100-procent-op-windstroom-11100865-a1564786>