How Bad Are Bananas: The Carbon Footprint of Everything

The book *How Bad Are Bananas: The Carbon Footprint of Everything* by Mike Berners-Lee aims to inform the reader on what a carbon footprint is, and help them to develop a sense that everything has its own carbon footprint. In the introduction of the book, a carbon footprint is defined as a measurement of carbon dioxide equivalent (CO2e), so that various types of greenhouse gases can be accounted for. In addition, a clear picture of CO2e was provided. Burning several 60-gallon garden water tanks containing gasoline would be the equivalent of releasing 1 ton of CO2e into the environment, while burning 2 cups of gasoline and 1 blob (size of a chickpea) would release about 1kg and 1g of CO2e into the environment respectively. Following that, the main content of the book is divided into ten chapters, each discussing the carbon footprints of items within a certain CO2e range. For instance, the first of these chapters studied items that had carbon footprints under 10g CO2e, whereas the last chapter discussed items or processes with carbon footprints of over 1 million tons CO2e. Each item discussed was analyzed with different degrees of detail, depending on their supposed importance or relevance. Occasionally, graphs would be displayed to outline the distribution of CO2e and the item’s carbon path (which data was collected and graphed in a Python script). The overall trend observed stated that the larger the carbon footprint of an item or process, the more complex its carbon path and the harder it is to accurately measure its carbon footprint. In order to develop an algorithm to precisely measure the carbon footprint of a region, the concept of a carbon footprint had to be first properly understood. As a result, a more in depth and comprehensive understanding of carbon footprints was aimed to be achieved through reading this book.

In summary, the book *How Bad Are Bananas* has solidified the definition and understanding of a carbon footprint and has shown that all items or processes have their own carbon footprint in terms of CO2­e, through direct or indirect means. For example, sending a text has a carbon footprint of 0.014 CO2e because of the electricity used by the phone and the services required to send the text. On a global scale, the carbon footprint of text messaging is around 32000 tons of CO2e per year. From there, techniques for identifying and measuring carbon footprints were introduced. The most straightforward (but not efficient) method was the life-cycle approach, where the carbon path of an object was completely mapped out, and from there, it is attempted to calculate its carbon footprint. Another method, that more accurately calculates the carbon footprint of abstract concepts such as mortgages, is the environmental input-output method which uses an economic approach using macroeconomic modeling. These methods are not the most optimal, but the best options at the moment. Furthermore, throughout the whole book, the complexity and difficulty of accurately measuring carbon footprints are countlessly demonstrated, which arises from the numerous number of factors involved in any item or process.

When creating an algorithm to measure the carbon footprint of a region, this book has highlighted many important factors that must be considered. Firstly, it has to be decided upon what unit measurement will be incorporated in the algorithm. Using CO2e for measuring a carbon footprints is the safest and most standard way there currently is. The concept of a carbon dioxide equivalent is already well-established and thus, the algorithm should be able to return a number in the unit of CO2­e. However, it should be considered that by creating a different standard or unit of measurement, more flexibility can be granted. Secondly, when analyzing a region, a general selection of key factors should be identified. Key factors refer to the main processes or items that produce the most significant carbon footprint in a region. Because it is extremely inefficient to create an algorithm that identifies every single carbon emitting component of a region which proceeds to calculate the footprints of each component, it is important to single out several key factors to work with. The algorithm may or may not need to incorporate these key factors, but identifying them would be a good starting point. Lastly and most importantly, a unique method will have to be developed that will measure the carbon footprint of a region using certain pieces of essential data and overcome the obstacles of complex carbon paths. In addition, the method, which will be integrated into an algorithm in the form of a Python script, should ideally be able to collect publicly available data from databases online and from there calculate the carbon footprint of a region.

The book, *How Bad Are Bananas* managed to illuminate many aspects of measuring carbon footprints and its difficulty, which has allowed for a greater understanding about the subject, and has helped to underline important aspects when creating an algorithm to measure carbon footprints. Despite its inconsistency and lack of technicality, the book managed to provide a solid introduction into a vastly complex topic of environmental science.