

COMP242 Project III

Background: <https://www.ochaopt.org/page/gaza-strip-electricity-supply>

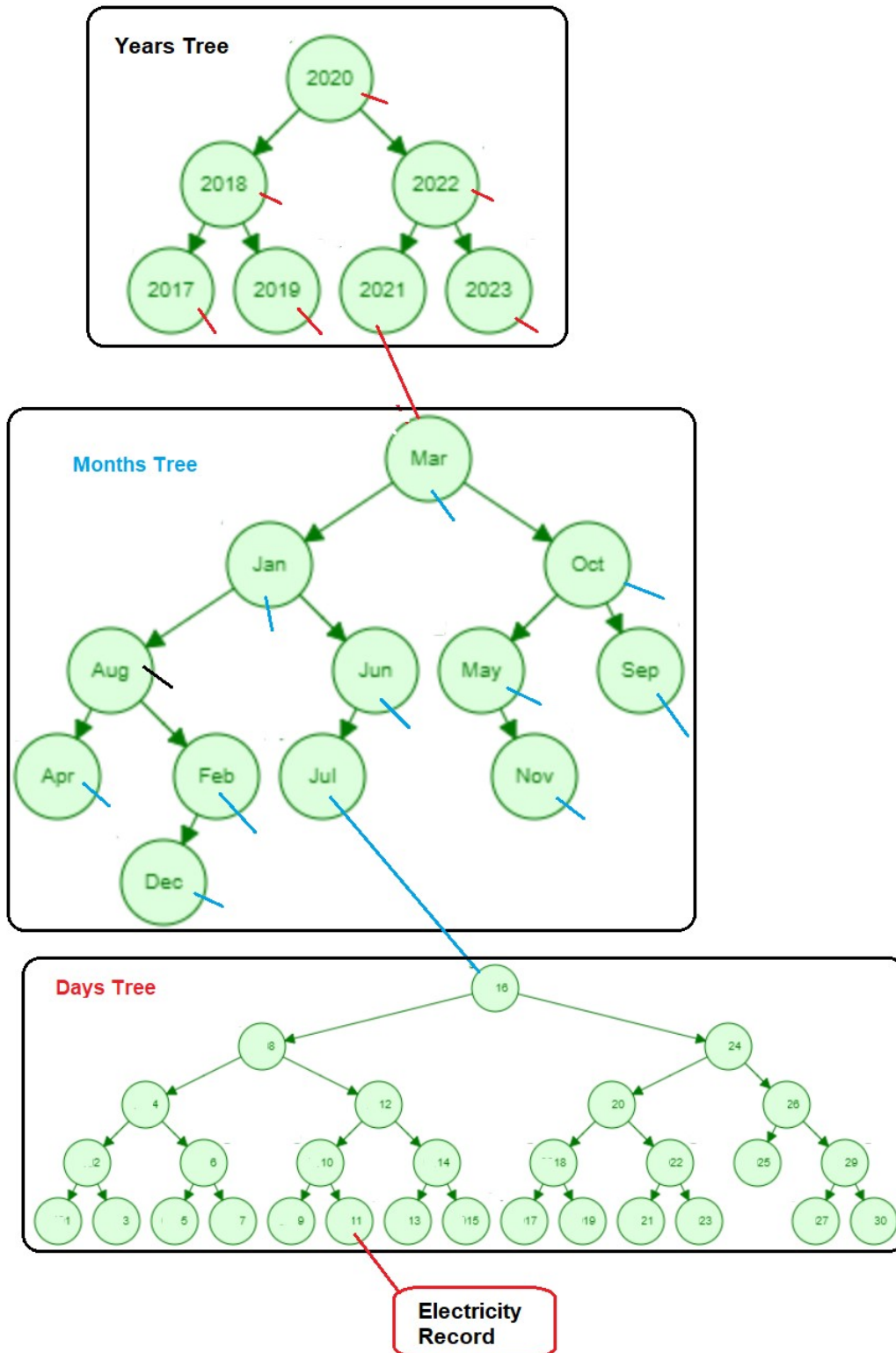


For the past decade, the Gaza Strip has suffered from a chronic electricity deficit, which undermined already fragile living conditions. The situation has further deteriorated since April 2017 in the context of disputes between the de facto authorities in Gaza and the West Bank-based Palestinian Authority. The ongoing power shortage has severely affected the availability of essential services, particularly health, water and sanitation services, and undermined Gaza's fragile economy, particularly the manufacturing and agriculture sectors.

The data presented in the attached file (Electricity.csv) is provided to OCHA on a daily basis by the Gaza Electricity Distribution Company (GEDCO), the official body in charge of electricity supply in the Gaza Strip. The variation in electricity demand per day is estimated based on the temperatures recorded on that day.

Task:

In this project, you will implement an Electricity data structure using **combined AVL trees**. The following figure shows the overall data structure:



The data input for this project will be the electricity data obtained from OCHA in a csv file (**Electricity.csv** attached)(note: this file is a normal text file; you can open it using notepad). Each line in thisfile contains a daily electricity record (**Date, Israeli_Lines_MWs, Gaza_Power_Plant_MWs, Egyptian_Lines_MWs, Total_daily_Supply_available_in_MWs, Overall_demand_in_MWs, Power_Cuts_hours_day_400mg,andTemp**) separated by comma (,).

YOU MAY NOT USE ARRAYS or ARRAYLIST IN THIS PROJECT.

For a good user experience, you will need to implement a graphical user interface (GUI) using javafx.

YOU MAY NOT USE SCENE BUILDER IN THIS PROJECT.

At the beginng, the user has to load the electricity file using a file chooser.Then the user will get a list of functions to choose from:

Mangement Screen:

1. An option to insert new electricity record.
2. An option to update anelectricity record.
3. An option to delete an electricity record.
4. An option to search for an electricity record by date.
5. **An option to traverse/print Years Tree and Months Tree and Days Tree level by level.**
6. **An option to display the height of Years Tree and Months Tree and Days Tree.**

Note: use a calendar GUI for anything related to date.

Statistics Screen:

An option to show statistics for:

- a. A specific electricity statistic for a given **day** across all months and years
- b. A specific electricity statistic for a given **month** across all days and years
- c. A specific electricity statistic for a given **year** across all days and months
- d. A total statistic for all data. Note: statistics include at least: total(sum), average, maximum, and minimum

Note: all the above functionalities should obtain the data from the combined trees data structure.

Save Screen: in this screen, you will have an option to save the updated trees back to a new file in the **same format as input file** separated by comma (,)

Use a file chooser to select the **folder** to save the **new** file in.

You have to study the time complexity of each function (above) and be ready to explain it during the discussion.

Good Luck!