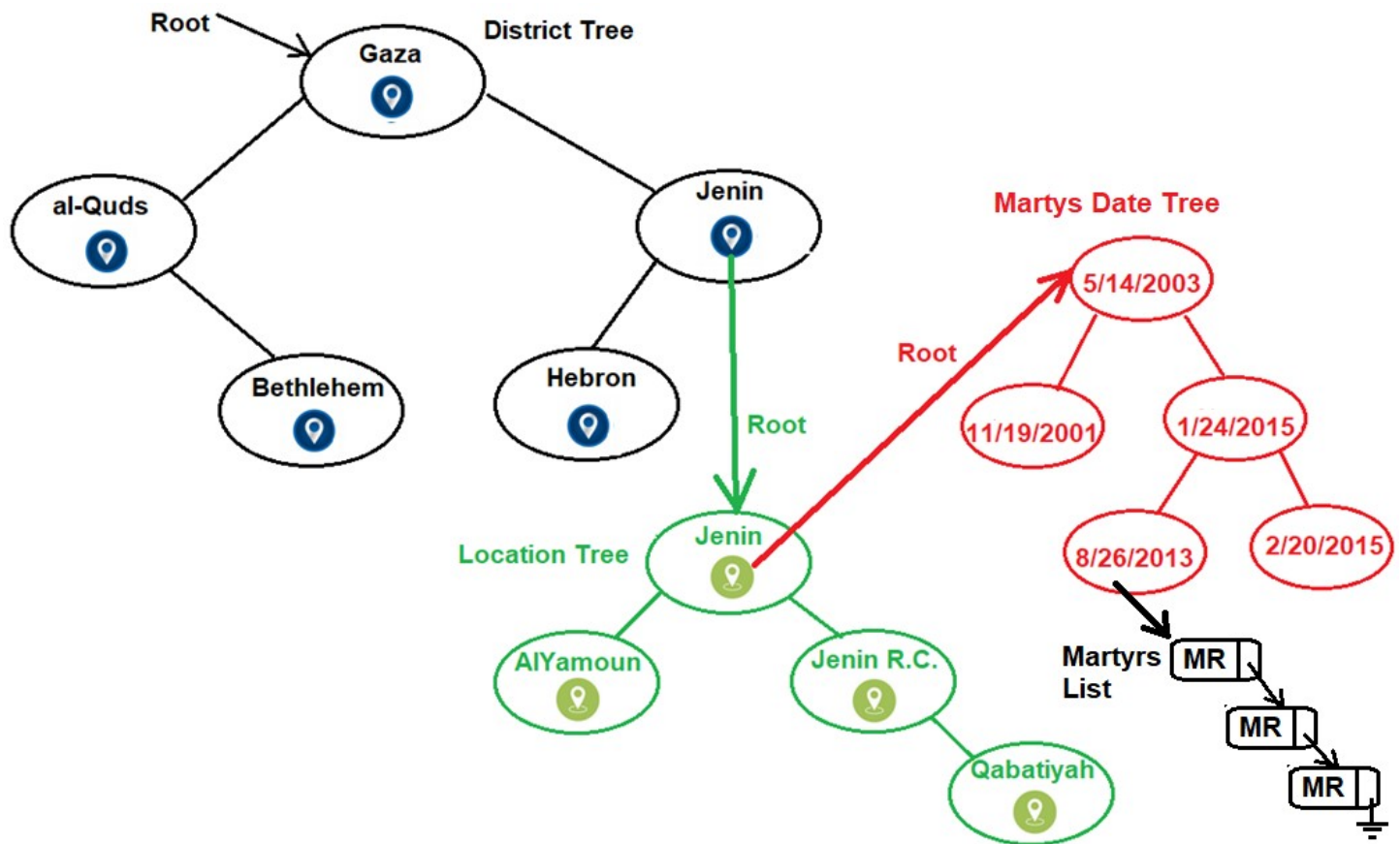


## COMP242 Project II

In this project, you will implement a new martyrs' data structure using Binary trees, stacks, and queues. The following figure shows the overall **districts-locations-dates-martyrs** data structure:



Note the following in this data structure:

- **Main District Tree:** this tree holds unique district records and sorted alphabetically ignoring the case. Each data record in this tree contains a **district name** and a **Location Tree**. This is the main entry of our data structure.
- **Location Tree:** this tree holds unique location records and sorted alphabetically ignoring the case. Each data record in this tree contains a **location name** and a **Martyr Date tree**.
- **Martyr Date tree:** this tree holds unique martyrs dates and sorted by **date**. Each data record in this tree is a date and a **linked list of martyrs** who died in that date.
- **Martyrs Linked list:** this linked list holds remaining martyr record info (**Name, Age, and Gender**) and sorted by **age** and **gender**.

The data input for this project will be a martyrs csv file (**data.csv** attached)

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

When running your project, at first, the user has to load the martyrs file using a **file chooser**. Your program has to read the file line-by-line and fill the **districts-locations-dates-martyrs** data structure appropriately. Then the user will get a list of district functions to choose from as follow:

**District Screen:** in this screen we need the following:

1. An option to insert new district to the district tree.
2. An option to update a district record.<sup>1</sup>
3. An option to delete a district record.<sup>1</sup>
4. Navigate throw districts in an **in-order traversal navigation** (i.e. start with the smallest district name to the largest) (e.g. From the above district tree chart, start from al-Quds, Bethlehem, Gaza, Hebron, to Jenin). The navigation has to have an option to go **next** district and go **previous** district). (Hint: you might need to use **stacks** and/or **queues**). While navigate throw districts show the following:
  - a. Total number of martyrs (in all locations that belongs to this district)
  - b. An option to load the current district's location into location screen.

**Location Screen:** in this screen we need the following:

1. An option to insert new location record to the location tree.
2. An option to update a location record.<sup>1</sup>
3. An option to delete a location record.<sup>1</sup>
4. Navigate throw district's locations **level-by-level and from left to right** manner. The navigation has to have an option to go **next** location and go **previous** location). (Hint: you might need to use **stacks** and/or **queues**). While navigate throw locations show the following:
  - a. The earliest date that has martyrs.
  - b. The latest dates that has martyrs.
  - c. The date that has the maximum number of martyrs.
  - d. An option to load the current location's martyrs into Martyr screen.

**Martyr Screen:** in this screen we need the following:

1. Navigate throw dates in an **in-order traversal navigation**. The navigation has to have an option to go **next** date and go **previous** date). While navigate throw dates show the following:
  - a. Average martyrs ages in that date.
  - b. The youngest and oldest martyrs in that date.
  - c. Show list of martyrs info sorted by name. (Bonus: show martyrs list in a tableview)
2. An option to insert a new martyr record to the martyrs linked list.
3. An option to update/delete a martyr record.<sup>1</sup>
4. An option to search for martyrs record by part of their names. (Bonus: show martyrs list in a tableview)

**Important:**

- To enter dates, use **DatePicker**.
- To enter District or Location, choose from a combo box.
- All the operations should consider the data from the created **districts-locations-dates-martyrs** data structure.
- Add an option to save the updated data structure it to a new file in the same format of the input file.

Good Luck!

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<sup>1</sup> Show a warning and a confirmation dialog before performing this action.