

CSCI-3901 Fall 2022

Final Project

High Level Breakdown Analysis

- **What comes into the program?**
 - Postal code information.
 - Hub distribution and damaged hubs information.
 - The following information will be saved in database:
 - postalCode
 - population
 - area
 - hubIdentifier
 - location
 - servicedAreas
 - repairEstimate
 - employeeId
 - repairTime
 - InService
 - For repair plan there will be:
 - startHub
 - maxDistance
 - MaxTime

- **What transformations do I need to make to the data?**
 - No transformation in data is required.

- **What part of the data is processed right away?**
 - Output will be calculated with the help of the data.

- **What part of the data do I need to keep longer?**
 - Postal code information
 - Hub distribution information
 - I will be using databases and internal data structures to store the information.
 - I will be creating three tables to store and process the data:

- PostalCode: This table will contain all the information about postal codes.
 - PostalCode: Primary key of the table.
 - Population
 - Area
- DistributionHub: This table will contain all the information about distribution hubs.
 - HubId: Primary key of the table.
 - ServicedAreas (Postal codes): Foreign key of the table.
 - Location
 - RepairEstimate
- HubRepair: This table will contain the information provided by the employee.
 - HubId: Foreign key of the table.
 - EmployeeId: Primary key of the table.
 - RepairTime
 - InService

• What goes out of the program?

- Information about what is going on in the province after hurricane Fiona and what our recovery plan is.
- The following things will go out of the program:
 - peopleOutOfService: Number of people out of service
 - List of DamagedPostalCodes: Returns the list of postal codes which are damaged.
 - List of fixOrder: provider the list of hubs in descending order.
 - List of rateOfServiceRestoration: Provides the rate at which people are restored to power.
 - List of repairPlan of impacted hubs: Returns the list of hubs an employee should follow to fix them.
 - Provide a plan for a vehicle to service hubs.
 - List of underservedPostalByPopulation: Return the list of postal codes beginning with the least served postal code by population.
 - List of underservedPostalByArea: Return the list of postal codes beginning with the least served postal code by area.

• What assumptions can I make?

- As given in the assignment
 - Postal code identifiers will not overlap.
 - Postal codes will be stable. Once created it will not be deleted.

- The entire province is out of power.
- **Exceptional handling**
 - **IllegalArgumentException:** will be thrown when there is an error along with an error message. Exception indicating that a method has received an argument that is invalid or inappropriate for this method's purposes.
 - **FileNotFoundException:** will be thrown when there is an error along with an error message. Occurs when an attempt to open a file denoted by a specified pathname fails.
 - **SQLException:** will be thrown when there is an error along with an error message. An exception that provides information on a database access error or other errors.
- **What constraints exist?**
 - Postal code information and distribution hub information only.
 - Only one province to handle.
- **Are there strange cases to handle?**
 - Different or illegal postal code information.
 - Different or illegal hub distribution information.
- **What is important for the solution to do?**
 - To provide the necessary output to start repairing the hubs.
- **Who are the users and how will they use it?**
 - Employees who are working to restore the power are the users. They would report damage or repairs to hubs to the central power utility to immediately be included in any reporting or planning.
 - They will use this with an app which is installed in their phones.
- **What is the target environment?**

- For the assignment, the target environment will be the command line terminal. It should work on platforms like Mac OS, Windows and Linux.
- **How stable are the requirements?**
 - Postal code information and hub distribution hubs information are static pieces of information. These do not change after getting recorded.