

CSCI-3901 Fall 2022

Final Project

Test Cases for Power Service

Input Validation Test Cases:

- **boolean addPostalCode (String postalCode, int population, int area)**
 - Null provided for postalCode.
 - Returns False
 - Illegal format provided for postalCode.
 - Returns False
 - Duplicate value provided for postalCode
 - Returns False
 - Valid value for postalCode provided.
 - Accepts the input and returns True
 - Negative value provided for population.
 - Returns False
 - Null provided for population.
 - Returns False
 - Valid value for population provided.
 - Accepts the input and returns True
 - Negative value provided for area.
 - Returns False
 - Null provided for area.
 - Returns False
 - Valid value for area provided.
 - Accepts the input and returns True
- **boolean addDistributionHub (String hubIdentifier, Point location, Set<String> servicedAreas)**
 - Empty string provided for hubIdentifier.
 - Returns False
 - Null provided for hubIdentifier.
 - Returns False
 - Illegal format provided for hubIdentifier.
 - Returns False

- Duplicate value provided for hubIdentifier
 - Returns False
 - Valid value for hubIdentifier provided.
 - Accepts the input.
 - location is null.
 - Returns False
 - location is an object of class Point
 - Accepts the input and return true.
 - ServicedAreas contains data structure other than String
 - Returns false
 - ServicedAreas does not contain any postal code
 - Returns false
 - ServicedAreas contains at least one postal code
 - Returns true
- **Void hubDamage (String hubIdentifier, float repairEstimate)**
 - Null provided for hubIdentifier.
 - Throws RuntimeException
 - Illegal format provided for hubIdentifier.
 - Throws RuntimeException
 - Valid value for hubIdentifier provided.
 - Accepts the input.
 - Negative value provided for repairEstimate.
 - Throws RuntimeException
 - Null provided for repairEstimate.
 - Throws RuntimeException
 - Valid value for repairEstimate provided.
 - Accepts the input and returns True

Void hubRepair(String hubIdentifier, String employeeId, float repairTime, boolean inService)

- Null provided for hubIdentifier.
 - Throws RuntimeException
- Illegal format provided for hubIdentifier.
 - Throws RuntimeException
- Duplicate value provided for hubIdentifier
 - Throws RuntimeException
- Valid value for hubIdentifier provided.
 - Accepts the input.
- Null provided for employeeId.

- Throws RuntimeException
 - Illegal format provided for employeeId.
 - Throws RuntimeException
 - Valid value for employeeId provided.
 - Accepts the input.
 - Duplicate value provided for employeeId
 - Throws RuntimeException
 - Negative value provided for repairEstimate.
 - Throws RuntimeException
 - Null provided for repairTime.
 - Throws RuntimeException
 - Valid value for repairTime provided.
 - Accepts the input and returns True
 - True/ False value passed for inService
 - Accepts the input
 - Value other than true/ false passed for inService
 - Throws RuntimeException
- **List<HubImpact> repairPlan (String startHub, int maxDistance, float maxTime)**
 - Null provided for startHub.
 - Throws RuntimeException
 - Illegal format provided for startHub.
 - Throws RuntimeException
 - Valid value for startHub provided.
 - Accepts the input.
 - Negative value provided for maxDistance.
 - Throws RuntimeException
 - Null provided for maxDistance.
 - Throws RuntimeException
 - Valid value for maxDistance provided.
 - Accepts the input
 - Negative value provided for maxTime.
 - Throws RuntimeException
 - Null provided for maxTime.
 - Throws RuntimeException
 - Valid value for maxTime provided.
 - Accepts the input

Boundary Test Cases

- **boolean addPostalCode (String postalCode, int population, int area)**
 - PostalCode is an empty string.
 - Throws RuntimeException
 - Population is 0
 - Throws RuntimeException
 - Population is negative
 - Throws RuntimeException
 - Area passed is 0
 - Throws RuntimeException
 - Area passed is negative
 - Throws RuntimeException

- **boolean addDistributionHub (String hubIdentifier, Point location, Set<String> servicedAreas)**
 - HubIdentifier is an empty string
 - Throws RuntimeException
 - Location does not contain any coordinates
 - Throws RuntimeException
 - ServicedAreas is an empty set
 - Throws RuntimeException

- **Void hubDamage (String hubIdentifier, float repairEstimate)**
 - HubIdentifier is an empty string
 - Throws RuntimeException
 - RepairEstimate is 0
 - Throws RuntimeException
 - RepairEstimate is in negative
 - Throws RuntimeException

- **Void hubRepair(String hubIdentifier, String employeeId, float repairTime, boolean inService)**
 - HubIdentifier is an empty string
 - Throws RuntimeException
 - RepairEstimate is 0
 - Throws RuntimeException
 - RepairEstimate is in negative
 - Throws RuntimeException
 - EmployeeId is an empty string
 - Throws RuntimeException
 - Duplicate EmployeeId entered
 - Throws RuntimeException

- **int peopleOutOfService ()**
 - Returns an integer value
 - Accepted
 - Returns a value other than integer
 - Throws RuntimeException

- **List<DamagedPostalCodes> mostDamagedPostalCodes (int limit)**
 - Call when mostDamagedPostalCodes is an empty list

- **List<HubImpact> fixOrder (int limit)**
 - Call when fixOrder is an empty list

- **List<Integer> rateOfServiceRestoration (float increment)**
 - Call when rateOfServiceRestoration is an empty list

- **List<HubImpact> repairPlan (String startHub, int maxDistance, float maxTime)**
 - Call when repairPlan is an empty list

- **List<String> underservedPostalByPopulation (int limit)**
 - Call when underservedPostalByPopulation is an empty list

- **List<String> underservedPostalByArea (int limit)**
 - Call when underservedPostalByArea is an empty list

Control Flow Test Cases

- **boolean addPostalCode (String postalCode, int population, int area)**
 - Constructor is called under normal conditions.
 - Instantiates the PowerService class.

- **boolean addDistributionHub (String hubIdentifier, Point location, Set<String> servicedAreas)**
 - Reading the hubIdentifier string more than once.
 - Returns false
 - ServicedAreas is a valid set
 - Returns true
 - Trying to set duplicate values in set
 - Returns false
 - ServicedAreas is not a valid set
 - Returns false

- **Void hubDamage (String hubIdentifier, float repairEstimate)**
 - Reading the hubIdentifier string more than once.
 - Returns false

- **Void hubRepair(String hubIdentifier, String employeeId, float repairTime, boolean inService)**
 - Trying to set duplicate employeeId
 - InService has other than boolean value

- **int peopleOutOfService ()**
 - Return people out of service

- **List<DamagedPostalCodes> mostDamagedPostalCodes (int limit)**
 - Return postal codes in any order other than descending order
 - False
 - Postal codes returned in descending order according to the limit set
 - True

- **List<HubImpact> fixOrder (int limit)**
 - Return fixorder of hubs in any order other than descending order
 - Runtime error
 - Fix order of hubs returned in descending order according to the limit set
 - List is returned
- **List<Integer> rateOfServiceRestoration (float increment)**
 - List is returned of list of hours of repair effort.

- List returned
- **List<HubImpact> repairPlan (String startHub, int maxDistance, float maxTime)**
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- **List<String> underservedPostalByPopulation (int limit)**
 - List is returned of underservedPostalByPopulation.
 - List returned
- **List<String> underservedPostalByArea (int limit)**
 - List is returned of underservedPostalByArea.
 - List returned

Data Flow Test Cases

- Call addPostalCode() method multiple times in a row
- Call adddistributionHub() method multiple times in a row
- Call hubDamage() method multiple times in a row
- Call hubRepair() method multiple times in a row
- Call hubDamage () method before calling addPostalCode () method
- Call hubDamage () method before calling adddistributionHub () method
- Call peopleOutOfService () method before calling addPostalCode () method
- Call peopleOutOfService () method before calling adddistributionHub () method
- Call mostDamagedpostalCodes() method before calling addPostalCode () method
- Call mostDamagedpostalCodes () method before calling adddistributionHub () method
- Call mostDamagedpostalCodes () method before calling hubRepair() method
- Call fixOrder() method before calling mostDamagedpostalCodes () method
- Call rateOfServiceRestoration() method before calling fixOrder() method
- Call repairplan() method multiple times in a row
- Call repairPlan() method before calling addPostalCode () method
- Call repairplan() method before calling adddistributionHub () method
- Call underservedPostalByPopulation() method before calling addPostalCode () method
- Call underservedPostalByPopulation() method before calling adddistributionHub() method

- Call underservedPostalByArea () method before calling addPostalCode () method
- Call underservedPostalByArea () method before calling adddistributionHub () method

Timeline of Feature Development

Serial No.	Feature development	Completed by	Status
1.	Conceptualizing the project	15/11/22	Completed
2.	Planning the development	25/11/22	In-progress
3.	Designing the project	30/11/22	To do
4.	Development of project	7/12/2022	To do
5.	Testing	12/12/2022	To do