Unit Testing for RRTS

1.1 People class - setPassword()

- Description : Set the password for first time Login.
- Action : the User gives desired password as input.
- Input : Password : abc123
- Expected Result : Changes the password of the object of People class to the input.
- Output : Password set to abc123
- Failure Condition : No change in the password

1.2 People class – checkPassword()

- Description : Verfication for logging into the software.
- Action : User gives password for Selected User ID.
- Input : Password : abc123
- Expected Result : the input password should be compared with already existing password
- Output : True
- Failure Condition : If output is False for correct password or True for wrong password

2.1 Complaint class - registerComplaint()

- Description : Clerk creates the complaint in the system that was raised by citizens using the info they provided.
- Action : User gives the details of the complaint i.e of the damaged road that needs to be repaired.
- Input :
    - Road : abc Road
    - Location : xyz colony
    - Branch : 3
    - Description : Potholes

- Expected Result: Constructs the object of complaint class with a suitable unique id and initializes its data fields as per given input and set Supervised to False
- Output : Complaint is created
- Failure Condition : No new instance of complaint is created or the required data fields are not set correctly.

2.2 Complaint class - updateComplaint()

- Description : Supervisor checks the complaints severity and estimates requirements , then updates its priority as per its urgency and also the resources required for the repair work.
- Action : Supervisor of a branch logins and studies the complaints lodged/created and updates the required fields.

- Input :
    - Priority : 4
    - Damage Severity: 3
    - Resources reqd:
        - Road roller : 1
        - Asphalt Paver : 1
        - Workers : 10
        - Bitumen(KGs) : 200

- Expected Result: Updates the complaint by adding to its remaining fields accordingly with the input given by supervisor and sets Supervised to True.
- Output: Complaint is updated and added to waiting queue.
- Failure Condition: The data fields priority, damage severity and resources doesn't get updated or simply Supervised field remains False.

3.1 Resources class - updateResources()

- Description : Resources needed to be updated regularly by the Administrator.
- Action : User gives data of Resources available.
- Input : Resources
    - Road roller : 16
    - Asphalt Paver : 10
    - Workers : 110
    - Bitumen(KGs) : 5000
- Expected Result : The resources data should be updated to given input.
- Output : Same as Input
- Failure Condition : If output isn’t same as the input.

4.1.1 Schedule class – scheduleRepair() with sufficient resources

- Description : the repair needs to be scheduled once all the complaints get updated by the branch superviser.
- Action : scheduleRepair function is called.
- Input :

Resources Available			
Road Roller	Asphalt Paver	Workers	Bitumen(KGs)
5	4	11	2000

Waiting Queue						
Complaint id	Branch	Road	Location	Priority	Damage Severity	Resources
1	1	abc	Area1	2	4	Road Roller: 1 Asphalt Paver: 1 Workers: 8 Bitumen(KGs): 200
2	1	xyz	Area2	5	4	Road Roller: 1

						Asphalt Paver: 1 Workers: 8 Bitumen(KGs): 350
3	1	qwe	Area3	2	2	Road Roller: 1 Asphalt Paver: 0 Workers: 6 Bitumen(KGs): 150

- Expected Result : the software should schedule the repair on the basis of priority of the and availability of resources in an efficient way so that most of the resources are utilized for that day.
- Output :

Repair Schedule for Branch 1 – Date 01/01/2021							
Complaint id	Road	Location	Priority	Damage Severity	Resources	Slot 1	Slot 2
2	xyz	Area2	5	4	Road Roller: 1 Asphalt Paver: 1 Workers: 8 Bitumen(KGs): 350	X	
3	qwe	Area3	2	2	Road Roller: 1 Asphalt Paver: 0 Workers: 6 Bitumen(KGs): 150	X	X
1	abc	Area1	2	4	Road Roller: 1 Asphalt Paver: 1 Workers: 8 Bitumen(KGs): 200		X

Waiting Queue						
Complaint id	Branch	Road	Location	Priority	Damage Severity	Resources
NIL						

- Failure Condition : If the software is not able to accommodate all the repairs in spite of having sufficient resources.

4.1.2 Schedule class – scheduleRepair() with insufficient resources

- Description : the repair needs to be scheduled once all the complaints get updated by the branch superviser.
- Action : scheduleRepair function is called.
- Input :

Resources Available			
Road Roller	Asphalt Paver	Workers	Bitumen(KGs)
5	4	11	1300

Waiting Queue

Complaint id	Branch	Road	Location	Priority	Damage Severity	Resources
4	1	asd	Area2	2	4	Road Roller: 1 Asphalt Paver: 1 Workers: 8 Bitumen(KGs): 200
5	1	mno	Area4	5	4	Road Roller: 1 Asphalt Paver: 1 Workers: 10 Bitumen(KGs): 350
6	1	pqr	Area5	2	2	Road Roller: 1 Asphalt Paver: 0 Workers: 6 Bitumen(KGs): 150

- Expected Result : the software should schedule the repair on the basis of priority of the and availability of resources in an efficient way so that most of the resources are utilized for that day.
- Output :

Repair Schedule for Branch 1 – Date 02/01/2021							
Complaint id	Road	Location	Priority	Damage Severity	Resources	Slot 1	Slot 2
5	mno	Area4	5	4	Road Roller: 1 Asphalt Paver: 1 Workers: 10 Bitumen(KGs): 350	X	
4	asd	Area2	2	4	Road Roller: 1 Asphalt Paver: 1 Workers: 8 Bitumen(KGs): 200		X

Waiting Queue						
Complaint id	Branch	Road	Location	Priority	Damage Severity	Resources
6	1	pqr	Area5	2	2	Road Roller: 1 Asphalt Paver: 0 Workers: 6 Bitumen(KGs): 150

- Failure Condition : If the software does not follow the priority order or doesn't come up with most efficient schedule.

5.1 Statistics class - workStatistics()

- Description : If the mayor asks for statistics of repairs done in a period of time the administrator provides him with those.

- Action: Administrator collects the statistics as requested by the mayor and presents them to him.
- Input : for input in section 4.1.1 and 4.1.2
- Expected Result: Number and type of repairs done(complaints
- resolved) in the given period of time.
- Output :

Completed Work						
Complaint id	Branch	Road	Location	Priority	Damage Severity	Resources
1	1	abc	Area1	2	4	Road Roller: 1 Asphalt Paver: 1 Workers: 8 Bitumen(KGs): 200
2	1	xyz	Area2	5	4	Road Roller: 1 Asphalt Paver: 1 Workers: 8 Bitumen(KGs): 350
3	1	qwe	Area3	2	2	Road Roller: 1 Asphalt Paver: 0 Workers: 6 Bitumen(KGs): 150
4	1	asd	Area2	2	4	Road Roller: 1 Asphalt Paver: 1 Workers: 8 Bitumen(KGs): 200
5	1	mno	Area4	5	4	Road Roller: 1 Asphalt Paver: 1 Workers: 10 Bitumen(KGs): 350

- Failure Condition: Expected statistics is not provided.

5.2 Statistics class - unfinishedWorks()

- Description : If the mayor asks for the details of repair works ongoing and are yet to be finished the administrator provides him with those.
- Action: Administrator collects the statistics as requested by the mayor and presents them to him.
- Input : same as in section 4.1.1 and 4.1.2
- Expected Result: Repair works ongoing at the present time of request and the works that are incomplete and their statistics.
- Output :

Unfinished works						
Complaint id	Branch	Road	Location	Priority	Damage Severity	Resources
6	1	pqr	Area5	2	2	Road Roller: 1

						Asphalt Paver: 0 Workers: 6 Bitumen(KGs): 150

- Failure Condition: Expected statistics is not provided.

.Statistics class - resourceStatistics()

- Description : If the mayor asks for details of resources used in a period of time the administrator provides him with those.
- Action: Administrator collects the statistics as requested by the mayor and presents them to him.
- Input : Same input as in section 4.1.1 and 4.1.2
- Expected Result: Machinery and manpower used for the repairs done in the given period of time.
- Output :

Resources Used			
Road Roller	Asphalt Paver	Worker's (Slots)	Bitumen(KGs)
5	4	40	1250

- Failure Condition: Expected statistics is not provided.

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