**Software Quality Engineering**

**Assignment # 1 & 2**

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**Github link:** https://github.com/minahilx/SQE

**Section # 1**

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# 

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# CASE STUDY

**Hospital Management System**

Taking care of our Health is the most prior thing in our lives and there is always in times of needs when our health is at risk and due to some reason we could not reach to clinics immediately and sometimes due to our hectic schedule we could not just go the clinic and waiting long queue just to take an appointment for the check up so we need some automated system which should be reliable, fast and accurate which should be there for us in times of needs

Hospital Management System is aimed to maintain the day-to-day state of admission/discharge of patients, a list of doctor's reports generation, etc.

This system will be designed to improve clinical workflow, and perform advanced appointment scheduling. This application will connect clinics and patient online through web based application. Now days no one has time to visit clinic and wait for appointment. This application will help for getting online appointment. Patient can get appointment through SMS or Internet.

Patient will request to make an appointment; receptionist will manage the appointment details. Doctors can make their schedule according to patient’s appointments, which should be at least 3 and at most 10 in a day**.** Once patient’s appointment gets confirmed then patient can see online how many people are waiting in queue for appointment and Receptionist saves appointment details. Doctor will upload all the patient medical history on portal. This information will be visible to the patient and the visiting Doctors only to maintain the privacy with help of their own personal login system which they have to provide their name which should be less than or equal to 20 alphabet character and should be greater than or equal to 6 character, password which should contain 6 characters at least and at most 10 character’s and contact number which contains less than or equal to 15 digit and greater than or equal to 7 digit. As patient and clinic will be connected online, if a patient gets transferred from one clinic to another clinic, visited clinics doctor can see medical history of that patient and personal information of patient using the portal. It will be a waiting room solution. Patient can pay the doctor’s bill through online payment system, which will be starting, from PRs.300 to PRs. 3000 according to patient treatment. Once the payment has been made, a medical receipt is provided to the patient, which includes what services provided and their respective costs that have been paid for.

Importance of web-based application is increasing day by day, it is important to manage all the healthcare data online. Now everyone has Internet connection and it is easy to use web application. This application will reduce the work of patient as well as doctor. Doctor does not need to take patient’s initial description such as weight, patient’s blood group repeatedly, because all this information will be entered at the time of registration of patient on website. Doctor will automatically see patient’s information. There is no more hardware required for patient and doctor. Efficient appointment schedules will reduce patient waiting time while keeping doctor’s idle time as low as possible without adding extra resources. Efficient and effective management of healthcare is imperative due to the efficient appointment scheduling.

# FUNCTIONS:

1. Manage\_Appointment (int appointment)
2. PayBill(Double amount)
3. Sign-up(String name, String password, String contact\_no)

# 

# BLACK BOX TESTING

## Boundary Value Analysis Testing:

### Function 1:*Manage\_Appointment (int noOfappointment)*

* **Constarint:**

Appointment should be at least 3 and at most 10

* **Boundary**:

noOfappointment = 3 and 10

* **Test** **cases**: 4(n) + 1 => 4(1) +1 = 5
* **Input values :**

min = 3

min+1= 4

normal = 7

max-1 = 9

max = 10

|  |  |  |
| --- | --- | --- |
| **Case** | **noOfappointment** | **Expected output** |
| 1 | 3 | ✓ |
| 2 | 4 | ✓ |
| 3 | 7 | ✓ |
| 4 | 9 | ✓ |
| 5 | 10 | ✓ |

✓ => Valid input

### Function 2: PayBill(Double amount)

* **Constraint:**

Bill should be in range of PRs.300 to PRs. 3000

* **Boundary**:

amount = 300 and 3000

* **Test** **cases**: 4(n) + 1 => 4(1) +1 = 5
* **Input values :**

min = 300

min+1= 301

normal = 1800

max-1 = 2999

max = 3000

|  |  |  |
| --- | --- | --- |
| **Case** | **amount** | **Expected output** |
| 1 | 300 | ✓ |
| 2 | 301 | ✓ |
| 3 | 1800 | ✓ |
| 4 | 2999 | ✓ |
| 5 | 3000 | ✓ |

**✓** => Valid input

### Function 3: Sign-up (String name, String password, String contact\_no)

* **Total Test cases**: 4n+1 => 4(3)+1 = 13
* **Constraint:**

**Name** should be less than or equal to 20 alphabet character and should be greater than or equal to 6 character.

**Password** should contain 6 characters at least and at most 10 characters.

**Contact\_no** should be less than or equal to 15 digit and greater than or equal to 7 digit.

* **Boundaries**:

Name = 6 and 20

Password = 6 and 10

Contact\_no = 7 and 15

* **Input values:**

**For name**

min = Newton

min+1= Thommas

normal = Mark Zukerburg

max-1 = Mahenoor Haider Ali

max = Aleaxander Hamillton

**For Password**

min = 123abc

min+1= 567mnop

normal = gho34566

max-1 = code22246

max = pinx123456

**For Contact\_no**

min = 1234567

min+1= 12345678

normal = 12345678910

max-1 = 12345678911234

max = 123456789112345

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Case** | **name** | **password** | **contact\_no** | **Expected output** |
| 1 | Mark Zukerburg | gho34566 | 1234567 | ✓ |
| 2 | Mark Zukerburg | gho34566 | 12345678 | ✓ |
| 3 | Mark Zukerburg | gho34566 | 12345678910 | ✓ |
| 4 | Mark Zukerburg | gho34566 | 12345678911234 | ✓ |
| 5 | Mark Zukerburg | gho34566 | 123456789112345 | ✓ |
| 6 | Newton | gho34566 | 12345678910 | ✓ |
| 7 | Thommas | gho34566 | 12345678910 | ✓ |
| 8 | Mahenoor Haider Ali | gho34566 | 12345678910 | ✓ |
| 9 | Aleaxander Hamillton | gho34566 | 12345678910 | ✓ |
| 10 | Mark Zukerburg | 123abc | 12345678910 | ✓ |
| 11 | Mark Zukerburg | 567mnop | 12345678910 | ✓ |
| 12 | Mark Zukerburg | code22246 | 12345678910 | ✓ |
| 13 | Mark Zukerburg | pinx123456 | 12345678910 | ✓ |

## Robust Boundary Value Analysis Testing:

## Function 1: Manage\_Appointment (int noOfappointment)

* **Constarint:**

Appointment should be at least 3 and at most 10

* **Boundary**:

noOfappointment = 3 and 10

* **Test** **cases**: 6(n) + 1 => 6(1) +1 = 7
* **Input values :**

Min-1= 2

Min = 3

Min+1= 4

Normal = 7

Max-1 = 9

Max = 10

Max+1= 11

|  |  |  |
| --- | --- | --- |
| **Case** | **noOfappointment** | **Expected output** |
| 1 | 2 | 🗶 |
| 2 | 3 | ✓ |
| 3 | 4 | ✓ |
| 4 | 7 | ✓ |
| 5 | 9 | ✓ |
| 6 | 10 | ✓ |
| 7 | 11 | 🗶 |

✓ => Valid input

🗶 => Invalid input

## Function 2: PayBill(Double amount)

* **Constraint:**

Bill should be in range of PRs.300 to PRs. 3000

* **Boundary**:

amount = 300 and 3000

* **Test** **cases**: 6(n) + 1 => 6(1) +1 = 7
* **Input values :**

Min-1= 299

Min = 300

Min+1= 301

Normal = 1800

Max-1 = 2999

Max = 3000

Max+1= 3001

|  |  |  |
| --- | --- | --- |
| **Case** | **amount** | **Expected output** |
| 1 | 299 | 🗶 |
| 2 | 300 | ✓ |
| 3 | 301 | ✓ |
| 4 | 1800 | ✓ |
| 5 | 2999 | ✓ |
| 6 | 3000 | ✓ |
| 7 | 3001 | 🗶 |

✓ => Valid input

🗶 => Invalid input

## Function3 : Sign-up (String name, String password, String contact\_no)

* **Total Test cases**: 6n+1 => 6(3)+1 = 19
* **Constraint:**

**Name** should be less than or equal to 20 alphabet character and should be greater than or equal to 6 character.

**Password** should contain 6 characters at least and at most 10 characters.

**Contact\_no** should be less than or equal to 15 digit and greater than or equal to 7 digit.

* **Boundaries**:

Name = 6 and 20

Password = 6 and 10

Contact\_no = 7 and 15

* **Input values:**

**For name**

Min-1= Jonas

Min = Newton

Min+1= Thommas

Normal = Mark Zukerburg

Max-1 = Mahenoor Haider Ali

Max = Aleaxander Hamillton

Max+1= Hubert Blaine Grayson

**For Password**

min-1= 123ab

min = 123abc

min+1= 567mnop

normal = gho34566

max-1 = code22246

max = pinx123456

max+1= putx4445556

**For Contact\_no**

min-1= 123456

min = 1234567

min+1= 12345678

normal = 12345678910

max-1 = 12345678911234

max = 123456789112345

max+1=224466889977551

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Case** | **name** | **password** | **Contact\_no** | **Expexted output** |
| 1 | Mark Zukerburg | gho34566 | 123456 | 🗶 |
| 2 | Mark Zukerburg | gho34566 | 1234567 | ✓ |
| 3 | Mark Zukerburg | gho34566 | 12345678 | ✓ |
| 4 | Mark Zukerburg | gho34566 | 12345678910 | ✓ |
| 5 | Mark Zukerburg | gho34566 | 12345678911234 | ✓ |
| 6 | Mark Zukerburg | gho34566 | 123456789112345 | ✓ |
| 7 | Mark Zukerburg | gho34566 | 224466889977551 | 🗶 |
| 8 | Mark Zukerburg | 123ab | 12345678910 | 🗶 |
| 9 | Mark Zukerburg | 123abc | 12345678910 | ✓ |
| 10 | Mark Zukerburg | 567mnop | 12345678910 | ✓ |
| 11 | Mark Zukerburg | code22246 | 12345678910 | ✓ |
| 12 | Mark Zukerburg | pinx123456 | 12345678910 | ✓ |
| 13 | Mark Zukerburg | putx4445556 | 12345678910 | 🗶 |
| 14 | Jonas | gho34566 | 12345678910 | 🗶 |
| 15 | Newton | gho34566 | 12345678910 | ✓ |
| 16 | Thommas | gho34566 | 12345678910 | ✓ |
| 17 | Mahenoor Haider Ali | gho34566 | 12345678910 | ✓ |
| 18 | Aleaxander Hamillton | gho34566 | 12345678910 | ✓ |
| 19 | Hubert Blaine Grayson | gho34566 | 12345678910 | 🗶 |

## Worst Case Boundary value Analysis Testing:

## Function 1:Manage\_Appointment (int noOfappointment)

* **Constarint:**

Appointment should be at least 3 and at most 10

* **Boundary**:

noOfappointment = 3 and 10

* **Test** **cases**: 5^n => 5^1 => 5
* **Input values :**

min = 3

min+1= 4

normal = 7

max-1 = 9

max = 10

|  |  |  |
| --- | --- | --- |
| **Case** | **noOfappointment** | **Expected output** |
| 1 | 3 | ✓ |
| 2 | 4 | ✓ |
| 3 | 7 | ✓ |
| 4 | 9 | ✓ |
| 5 | 10 | ✓ |

✓ => Valid input

## **Function 2**:PayBill(Double amount)

* **Constraint:**

Bill should be in range of PRs.300 to PRs. 3000

* **Boundary**:

Amount = 300 and 3000

* **Test** **cases**: 5^n => 5^1 => 5
* **Input values:**

min = 300

min+1= 301

normal = 1800

max-1 = 2999

max = 3000

|  |  |  |
| --- | --- | --- |
| **Case** | **amount** | **Expected output** |
| 1 | 300 | ✓ |
| 2 | 301 | ✓ |
| 3 | 1800 | ✓ |
| 4 | 2999 | ✓ |
| 5 | 3000 | ✓ |

✓ => Valid input

### Function3: Sign-up (String name, String password, String contact\_no)

* **Test** **cases**: 5^n => 5^3 => 125
* **Constraint:**

**Name** should be less than or equal to 20 alphabet character and should be greater than or equal to 6 character.

**Password** should contain 6 characters at least and at most 10 characters.

**Contact\_no** should be less than or equal to 15 digit and greater than or equal to 7 digit.

* **Boundaries**:

Name = 6 and 20

Password = 6 and 10

Contact\_no = 7 and 15

* **Input values =**

**For name**

min = Newton

min+1= Thommas

normal = Mark Zukerburg

max-1 = Mahenoor Haider Ali

max = Aleaxander Hamillton

**For Password**

min = 123abc

min+1= 567mnop

normal = gho34566

max-1 = code22246

max = pinx123456

**For Contact\_no**

min = 1234567

min+1= 12345678

normal = 12345678910

max-1 = 12345678911234

max = 123456789112345

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Case** | **name** | **password** | **contact\_no** | **Expected output** |
|  | Newton | 123abc | 1234567 | ✓ |
|  | Newton | 123abc | 12345678 | ✓ |
|  | Newton | 123abc | 12345678910 | ✓ |
|  | Newton | 123abc | 12345678911234 | ✓ |
|  | Newton | 123abc | 123456789112345 | ✓ |
|  | Newton | 567mnop | 1234567 | ✓ |
|  | Newton | 567mnop | 12345678 | ✓ |
|  | Newton | 567mnop | 12345678910 | ✓ |
|  | Newton | 567mnop | 12345678911234 | ✓ |
|  | Newton | 567mnop | 123456789112345 | ✓ |
|  | Newton | gho34566 | 1234567 | ✓ |
|  | Newton | gho34566 | 12345678 | ✓ |
|  | Newton | gho34566 | 12345678910 | ✓ |
|  | Newton | gho34566 | 12345678911234 | ✓ |
|  | Newton | gho34566 | 123456789112345 | ✓ |
|  | Newton | code22246 | 1234567 | ✓ |
|  | Newton | code22246 | 12345678 | ✓ |
|  | Newton | code22246 | 12345678910 | ✓ |
|  | Newton | code22246 | 12345678911234 | ✓ |
|  | Newton | code22246 | 123456789112345 | ✓ |
|  | Newton | pinx123456 | 1234567 | ✓ |
|  | Newton | pinx123456 | 12345678 | ✓ |
|  | Newton | pinx123456 | 12345678910 | ✓ |
|  | Newton | pinx123456 | 12345678911234 | ✓ |
|  | Newton | pinx123456 | 123456789112345 | ✓ |
|  | Thommas | 123abc | 1234567 | ✓ |
|  | Thommas | 123abc | 12345678 | ✓ |
|  | Thommas | 123abc | 12345678910 | ✓ |
|  | Thommas | 123abc | 12345678911234 | ✓ |
|  | Thommas | 123abc | 123456789112345 | ✓ |
|  | Thommas | 567mnop | 1234567 | ✓ |
|  | Thommas | 567mnop | 12345678 | ✓ |
|  | Thommas | 567mnop | 12345678910 | ✓ |
|  | Thommas | 567mnop | 12345678911234 | ✓ |
|  | Thommas | 567mnop | 123456789112345 | ✓ |
|  | Thommas | gho34566 | 1234567 | ✓ |
|  | Thommas | gho34566 | 12345678 | ✓ |
|  | Thommas | gho34566 | 12345678910 | ✓ |
|  | Thommas | gho34566 | 12345678911234 | ✓ |
|  | Thommas | gho34566 | 123456789112345 | ✓ |
|  | Thommas | code22246 | 1234567 | ✓ |
|  | Thommas | code22246 | 12345678 | ✓ |
|  | Thommas | code22246 | 12345678910 | ✓ |
|  | Thommas | code22246 | 12345678911234 | ✓ |
|  | Thommas | code22246 | 123456789112345 | ✓ |
|  | Thommas | pinx123456 | 1234567 | ✓ |
|  | Thommas | pinx123456 | 12345678 | ✓ |
|  | Thommas | pinx123456 | 12345678910 | ✓ |
|  | Thommas | pinx123456 | 12345678911234 | ✓ |
|  | Thommas | pinx123456 | 123456789112345 | ✓ |
|  | Mark Zukerburg | 123abc | 1234567 | ✓ |
|  | Mark Zukerburg | 123abc | 12345678 | ✓ |
|  | Mark Zukerburg | 123abc | 12345678910 | ✓ |
|  | Mark Zukerburg | 123abc | 12345678911234 | ✓ |
|  | Mark Zukerburg | 123abc | 123456789112345 | ✓ |
|  | Mark Zukerburg | 567mnop | 1234567 | ✓ |
|  | Mark Zukerburg | 567mnop | 12345678 | ✓ |
|  | Mark Zukerburg | 567mnop | 12345678910 | ✓ |
|  | Mark Zukerburg | 567mnop | 12345678911234 | ✓ |
|  | Mark Zukerburg | 567mnop | 123456789112345 | ✓ |
|  | Mark Zukerburg | gho34566 | 1234567 | ✓ |
|  | Mark Zukerburg | gho34566 | 12345678 | ✓ |
|  | Mark Zukerburg | gho34566 | 12345678910 | ✓ |
|  | Mark Zukerburg | gho34566 | 12345678911234 | ✓ |
|  | Mark Zukerburg | gho34566 | 123456789112345 | ✓ |
|  | Mark Zukerburg | code22246 | 1234567 | ✓ |
|  | Mark Zukerburg | code22246 | 12345678 | ✓ |
|  | Mark Zukerburg | code22246 | 12345678910 | ✓ |
|  | Mark Zukerburg | code22246 | 12345678911234 | ✓ |
|  | Mark Zukerburg | code22246 | 123456789112345 | ✓ |
|  | Mark Zukerburg | pinx123456 | 1234567 | ✓ |
|  | Mark Zukerburg | pinx123456 | 12345678 | ✓ |
|  | Mark Zukerburg | pinx123456 | 12345678910 | ✓ |
|  | Mark Zukerburg | pinx123456 | 12345678911234 | ✓ |
|  | Mark Zukerburg | pinx123456 | 123456789112345 | ✓ |
|  | Mahenoor Haider Ali | 123abc | 1234567 | ✓ |
|  | Mahenoor Haider Ali | 123abc | 12345678 | ✓ |
|  | Mahenoor Haider Ali | 123abc | 12345678910 | ✓ |
|  | Mahenoor Haider Ali | 123abc | 12345678911234 | ✓ |
|  | Mahenoor Haider Ali | 123abc | 123456789112345 | ✓ |
|  | Mahenoor Haider Ali | 567mnop | 1234567 | ✓ |
|  | Mahenoor Haider Ali | 567mnop | 12345678 | ✓ |
|  | Mahenoor Haider Ali | 567mnop | 12345678910 | ✓ |
|  | Mahenoor Haider Ali | 567mnop | 12345678911234 | ✓ |
|  | Mahenoor Haider Ali | 567mnop | 123456789112345 | ✓ |
|  | Mahenoor Haider Ali | gho34566 | 1234567 | ✓ |
|  | Mahenoor Haider Ali | gho34566 | 12345678 | ✓ |
|  | Mahenoor Haider Ali | gho34566 | 12345678910 | ✓ |
|  | Mahenoor Haider Ali | gho34566 | 12345678911234 | ✓ |
|  | Mahenoor Haider Ali | gho34566 | 123456789112345 | ✓ |
|  | Mahenoor Haider Ali | code22246 | 1234567 | ✓ |
|  | Mahenoor Haider Ali | code22246 | 12345678 | ✓ |
|  | Mahenoor Haider Ali | code22246 | 12345678910 | ✓ |
|  | Mahenoor Haider Ali | code22246 | 12345678911234 | ✓ |
|  | Mahenoor Haider Ali | code22246 | 123456789112345 | ✓ |
|  | Mahenoor Haider Ali | pinx123456 | 1234567 | ✓ |
|  | Mahenoor Haider Ali | pinx123456 | 12345678 | ✓ |
|  | Mahenoor Haider Ali | pinx123456 | 12345678910 | ✓ |
|  | Mahenoor Haider Ali | pinx123456 | 12345678911234 | ✓ |
|  | Mahenoor Haider Ali | pinx123456 | 123456789112345 | ✓ |
|  | Aleaxander Hamillton | 123abc | 1234567 | ✓ |
|  | Aleaxander Hamillton | 123abc | 12345678 | ✓ |
|  | Aleaxander Hamillton | 123abc | 12345678910 | ✓ |
|  | Aleaxander Hamillton | 123abc | 12345678911234 | ✓ |
|  | Aleaxander Hamillton | 123abc | 123456789112345 | ✓ |
|  | Aleaxander Hamillton | 567mnop | 1234567 | ✓ |
|  | Aleaxander Hamillton | 567mnop | 12345678 | ✓ |
|  | Aleaxander Hamillton | 567mnop | 12345678910 | ✓ |
|  | Aleaxander Hamillton | 567mnop | 12345678911234 | ✓ |
|  | Aleaxander Hamillton | 567mnop | 123456789112345 | ✓ |
|  | Aleaxander Hamillton | gho34566 | 1234567 | ✓ |
|  | Aleaxander Hamillton | gho34566 | 12345678 | ✓ |
|  | Aleaxander Hamillton | gho34566 | 12345678910 | ✓ |
|  | Aleaxander Hamillton | gho34566 | 12345678911234 | ✓ |
|  | Aleaxander Hamillton | gho34566 | 123456789112345 | ✓ |
|  | Aleaxander Hamillton | code22246 | 1234567 | ✓ |
|  | Aleaxander Hamillton | code22246 | 12345678 | ✓ |
|  | Aleaxander Hamillton | code22246 | 12345678910 | ✓ |
|  | Aleaxander Hamillton | code22246 | 12345678911234 | ✓ |
|  | Aleaxander Hamillton | code22246 | 123456789112345 | ✓ |
|  | Aleaxander Hamillton | pinx123456 | 1234567 | ✓ |
|  | Aleaxander Hamillton | pinx123456 | 12345678 | ✓ |
|  | Aleaxander Hamillton | pinx123456 | 12345678910 | ✓ |
|  | Aleaxander Hamillton | pinx123456 | 12345678911234 | ✓ |
|  | Aleaxander Hamillton | pinx123456 | 123456789112345 | ✓ |
|  | Aleaxander Hamillton | 123abc | 1234567 | ✓ |
|  | Aleaxander Hamillton | 123abc | 12345678 | ✓ |

## Robust Worst Case Testing

### Function 1:Manage\_Appointment (int noOfappointment)

* **Constarint:**

Appointment should be at least 3 and at most 10

* **Boundary**:

***noOfappointmen =>*** *3* and 10

* **Test** **cases**: 7^n => 7^1 => 7
* **Input value:**

Min-1= 2

Min = 3

Min+1= 4

Normal = 7

Max-1 = 9

Max = 10

Max+1= 11

|  |  |  |
| --- | --- | --- |
| **Case** | **noOfappointment** | **Expected output** |
| 1 | 2 | 🗶 |
| 2 | 3 | ✓ |
| 3 | 4 | ✓ |
| 4 | 7 | ✓ |
| 5 | 9 | ✓ |
| 6 | 10 | ✓ |
| 7 | 11 | 🗶 |

✓ => Valid input

🗶 => Invalid input

### Function 2:PayBill(Double amount)

* **Constraint:**

Bill should be in range of PRs.300 to PRs. 3000

* **Boundary**:

**Amount** => 300 and 3000

* **Test** **cases**: 7^n => 7^1 => 7
* **Input values:**

Min-1= 299

Min = 300

Min+1= 301

Normal = 1800

Max-1 = 2999

Max = 3000

Max+1= 3001

|  |  |  |
| --- | --- | --- |
| **Case** | **amount** | **Expected output** |
| 1 | 299 | 🗶 |
| 2 | 300 | ✓ |
| 3 | 301 | ✓ |
| 4 | 1800 | ✓ |
| 5 | 2999 | ✓ |
| 6 | 3000 | ✓ |
| 7 | 3001 | 🗶 |

✓ => Valid input

🗶 => Invalid input

## Function 3:Sign-up (String name, String password, String contact\_no)

* **Test** **cases**: 7^n => 7^3 => 343
* **Constraint:**

**Name** should be less than or equal to 20 alphabet character and should be greater than or equal to 6 character.

**Password** should contain 6 characters at least and at most 10 characters.

**Contact\_no** should be less than or equal to 15 digit and greater than or equal to 7 digit.

**Boundaries**:

name = 6 and 20

password = 6 and 10

contact\_no = 7 and 15

* **Input values:**

**For name**

Min-1= Jonas

Min = Newton

Min+1= Thommas

Normal = Mark Zukerburg

Max-1 = Mahenoor Haider Ali

Max = Aleaxander Hamillton

Max+1= Hubert Blaine Grayson

**For Password**

min-1= 123ab

min = 123abc

min+1= 567mnop

normal = gho34566

max-1 = code22246

max = pinx123456

max+1= putx4445556

**For Contact\_no**

min-1= 123456

min = 1234567

min+1= 12345678

normal = 12345678910

max-1 = 12345678911234

max = 123456789112345

max+1=224466889977551

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Case** | **Name** | **Password** | **Contact\_no** | **Expected Output** |
|  | Jonas | 123ab | 123456 | 🗶 |
|  | Jonas | 123ab | 1234567 | 🗶 |
|  | Jonas | 123ab | 12345678 | 🗶 |
|  | Jonas | 123ab | 12345678910 | 🗶 |
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|  | Mahenoor Haider Ali | 123ab | 123456 | 🗶 |
|  | Mahenoor Haider Ali | 123ab | 1234567 | 🗶 |
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✓ => Valid input

🗶 => Invalid input

## Strong Robust Equivalence Class Partitioning:

### Function 1:Manage\_Appointment (int noOfappointment)

* **Constraint:**

Appointments has be at least 3 and at most 10

* **Test cases:**

Normal value: 6

Upper robust value: 11

Lower robust value: 2

|  |  |  |
| --- | --- | --- |
| **Case** | **noOfappointment** | **Expected output** |
| 1 | 6 | ✓ |
| 2 | 11 | 🗶 |
| 3 | 2 | 🗶 |

✓ => Valid input

🗶 => Invalid input

### Function 2: *PayBill(Double amount)*

* **Constraint:**

Bill should be greater than or equal to PRs.300 and less than or equal to PRs. 3000

* **Test cases:**

Normal value: 2000

Upper robust value: 3001

Lower robust value: 299

|  |  |  |
| --- | --- | --- |
| **Case** | **amount** | **Expected output** |
| 1 | 2000 | ✓ |
| 2 | 3001 | 🗶 |
| 3 | 299 | 🗶 |

✓ => Valid input

🗶 => Invalid input

### Function 3: Sign-up (String name, String password, String contact\_no)

* **Constraint:**

**Name** should be less than or equal to 20 alphabet character and should be greater than or equal to 6 character.

**Password** should contain 6 characters at least and at most 10 characters.

**Contact\_no** should be less than or equal to 15 digit and greater than or equal to 7 digit.

* **Test cases:**

**For Name:**

Normal value: Thommas

Upper robust value: Hubert Blaine Grayson (spaces are also

considered)

Lower robust value: Jonas

**For Password:**

Normal value: gho34566

Upper robust value: putx4445556

Lower robust value: 123ab

**For Contact\_no:**

Normal value: 12345678911

Upper robust value: 2244668899775512

Lower robust value: 123456

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Case** | **Name** | **Password** | **Contact\_no** | **Expected**  **output** |
| 1 | Hubert Blaine Grayson | putx4445556 | 2244668899775512 |  |
| 2 | Hubert Blaine Grayson | putx4445556 | 12345678911 |  |
| 3 | Hubert Blaine Grayson | gho34566 | 2244668899775512 |  |
| 4 | Thommas | putx4445556 | 2244668899775512 |  |
| 5 | Hubert Blaine Grayson | gho34566 | 12345678911 |  |
| 6 | Thommas | putx4445556 | 12345678911 |  |
| 7 | Thommas | gho34566 | 2244668899775512 |  |
| 8 | Jonas | 123ab | 123456 |  |
| 9 | Jonas | 123ab | 12345678911 |  |
| 10 | Jonas | gho34566 | 123456 |  |
| 11 | Thommas | 123ab | 123456 |  |
| 12 | Thommas | gho34566 | 123456 |  |
| 13 | Jonas | gho34566 | 12345678911 |  |
| 14 | Thommas | 123ab | 12345678911 |  |
| 15 | Thommas | gho34566 | 12345678911 |  |

1. **Cause Effect Graphing**
2. **Identify Causes and effects**

|  |  |
| --- | --- |
| **Causes** | **Effects** |
| **C1:** Doctors uploads patient medical history on portal | **E1:** Patient medical history will be visible to the patient  **E2:** Patient medical history will be visible to the doctor |
| **C2:** User enters name in string, which is less than or equal to 20 alphabet characters and greater than or equal to 6 characters.  **C3:** User enters password in string, which is at least 6 characters and at most 10 characters.  **C4:** User enters contact no in digits, which is at least 7 digits and at most 15 digits. | **E3:** Registered |
| **C5:** User enters password in string, which is at least 6 characters and at most 10 characters. | **E4:** Logins |
| **C6:** Patient gets transferred from one clinic to another | **E5:** Visited clinic doctor can view medical history of that patient  **E6:** Visited clinic doctor can view personal information of that patient |
| **C7:** Patient pays bill within range of PR. 300 to PR. 3000 according to patient’s treatment | **E7:** Provide a medical receipt to patient |
| **C8:** Patient requests for making an appointment | **E8:** Receptionist manages appointment details. |
| **C9:** If Appointments made are at least 3 and at most 10 in a day. | **E9:** Doctors can make their schedule according to patients appointments |
| **C10:** Once patients appointment gets confirmed | **E10:** Patient can see online how many people are waiting in queue for appointment.  **E11:** Receptionist saves appointment details. |

1. **Graphs:**

C1

E1

E2

C2

AND

C4

C3

E3

E11

E10

C10

E9

C9

E8

E7

E6

C6

C8

C7

E5

E6

E4

C5

C5

1. **Decision Table:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 |
| **cause** | C1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **cause** | C2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **cause** | C3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **cause** | C4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **cause** | C5 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| **cause** | C6 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| **cause** | C7 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| **cause** | C8 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| **cause** | C9 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| **cause** | C10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **Effect** | E1 | 1 | - | - | - | - | - | - | - |
| **Effect** | E2 | 1 | - | - | - | - | - | - | - |
| **Effect** | E3 | - | 1 | - | - | - | - | - | - |
| **Effect** | E4 | - | - | 1 | - | - | - | - | - |
| **Effect** | E5 | - | - | - | 1 | - | - | - | - |
| **Effect** | E6 | - | - | - | 1 | - | - | - | - |
| **Effect** | E7 | - | - | - | - | 1 | - | - | - |
| **Effect** | E8 | - | - | - | - | - | 1 | - | - |
| **Effect** | E9 | - | - | - | - | - | - | 1 | - |
| **Effect** | E10 | - | - | - | - | - | - | - | 1 |
| **Effect** | E11 | - | - | - | - | - | - | - | 1 |

1. **Identifying Test cases:**

|  |  |  |
| --- | --- | --- |
| **Test cases** | **Input (Cause)** | **Expected Output (Effect)** |
| 1 | * name >=6 **&&** name <=20 * password>=6**&&**password<=10 * contact\_no>=7**&&**contact\_no<=15 | Registered |
| 2 | * password>=6**&&**password<=10 | Login |
| 3 | * bill>=300 **&&** bill<=3000 | Generate medical receipt |
| 4 | * appointments>=3**&&**appointments<=10 | Make schedule |

1. **Test cases:**

Applying Weak Robust Equivalence Class.

|  |  |  |
| --- | --- | --- |
| **Test case #** | **Inputs (causes)** | **Expected Output (effects)** |
| **T1** | |  |  |  | | --- | --- | --- | | **Name** | **Password** | **Contact\_no** | | Jonas | 123ab | 123456 | | Thommas | gho34566 | 12345678911 | | Keannaemilyelizebeth | putx4445556 | 2244668899775512 | | |  | | --- | | Invalid | | Valid (registered) | | Invalid | |
| **T2** | |  | | --- | | **Password** | | 123ab | | gho34566 | | putx4445556 | | |  | | --- | | Invalid | | Valid (login) | | Invalid | |
| **T3** | |  | | --- | | **Bill** | | 299 | | 2000 | | 3001 | | |  | | --- | | Invalid | | Valid (generate medical receipt) | | Invalid | |
| **T4** | |  | | --- | | **Appointment** | | 2 | | 6 | | 11 | | |  | | --- | | Invalid | | Valid (makes schedule) | | Invalid | |