**Black Box testing: Equivalence class and boundary value testing**

1. **Test Case for Login**

| No. | Username | Password | Expected output | Actual output | Pass/Fail |
| --- | --- | --- | --- | --- | --- |
| 1 | Jack | number123 | Sent to Dashboard | Sent to Dashboard | Pass |
| 2 |  | number123 | Display message:  “Please enter both username and password” | Display message:  “Please enter both username and password” | Pass |
| 3 | Jack |  | Display message:  “Please enter both username and password” | Display message:  “Please enter both username and password” | Pass |
| 4 | random | number123 | Display message:  “Invalid username or password” | Display message:  “Invalid username or password” | Pass |
| 5 | Jack | password123 | Display message:  “Invalid username or password” | Display message:  “Invalid username or password” | Pass |

1. **Test Case for Register Account**

| No. | Username | Password | Full Name | Email address | Expected output | Actual output | Pass/Fail |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | Jack | number123 | Jackie | Jackie123@gmail.com | Display message:  “Account registered Successfully” | Display message:  “Account registered Successfully” | Pass |
| 2 |  | number123 | Jackie | Jackie123@gmail.com | Display message:  “Please fill in all fields” | Display message:  “Please fill in all fields” | Pass |
| 3 | Jack |  | Jackie | Jackie123@gmail.com | Display message:  “Please fill in all fields” | Display message:  “Please fill in all fields” | Pass |
| 4 | Jack | number123 |  | Jackie123@gmail.com | Display message:  “Please fill in all fields” | Display message:  “Please fill in all fields” | Pass |
| 5 | Jack | number123 | Jackie |  | Display message:  “Please fill in all fields” | Display message:  “Please fill in all fields” | Pass |

1. **Test Case for Account Details**

| No. | Update Username | Update Email | Update Full Name | Update Email address | Expected output | Actual output | Pass/Fail |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | Mary | number123 | Jackie | Jackie123@gmail.com | Display message:  “Details updated Successfully” | Display message:  “Details updated  Successfully” | Pass |
| 2 | Jack | password | Jackie | Jackie123@gmail.com | Display message:  “Account registered Successfully” | Display message:  “Account registered Successfully” | Pass |
| 3 | Jack | number123 | Jackie Chan | Jackie123@gmail.com | Display message:  “Account registered Successfully” | Display message:  “Account registered Successfully” | Pass |
| 4 | Jack | number123 | Jackie | JackieChan@gmail.com | Display message:  “Account registered Successfully” | Display message:  “Account registered Successfully” | Pass |
| 7 |  | number123 | Jackie | Jackie123@gmail.com | Display message:  “No fields can be left blank” | Display message:  “No fields can be left blank” | Pass |
| 8 | Jack |  | Jackie | Jackie123@gmail.com | Display message:  “No fields can be left blank” | Display message:  “No fields can be left blank” | Pass |
| 9 | Jack | number123 |  | Jackie123@gmail.com | Display message:  “No fields can be left blank” | Display message:  “No fields can be left blank” | Pass |
| 10 | Jack | number123 | Jackie |  | Display message:  “No fields can be left blank” | Display message:  “No fields can be left blank” | Pass |
| 11 | Admin | number123 | Jackie | Jackie123@gmail.com | Display message:  “update failed” | Display message:  “update failed” | Pass |

1. **Test Case for Adding Device**

| No. | Device | Device name | Power Usage(Wh) | Duration  (hours) | Duration  (minutes) | Expected output | Actual output | Pass/Fail |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | TV | Philips Smart TV | 300 | 2 | 30 | Display message:  “Device added successfully” | Display message:  “Device added successfully” | Pass |
| 2 | TV |  | 300 | 2 | 30 | Display message:  “Device added successfully” Device name will be defaulted to TV | Display message:  “Device added successfully” Device name will be defaulted to TV | Pass |
| 4 | TV | Philips Smart TV |  | 2 | 30 | Display message:  “Device power usage cannot be empty” | Display message:  “Device power usage cannot be empty” | Pass |
| 5 | TV | Philips Smart TV | 300 |  |  | Display message:  “Please enter duration for hours and minutes” | Display message:  “Please enter duration for hours and minutes” | Pass |
| 7 | TV | Philips Smart TV | 300 |  | 0 | Display message:  “Device added successfully” Duration will be 0 | Display message:  “Device added successfully” Duration will be 0 | Pass |
| 6 | TV | Philips Smart TV | 300 | 25 | 00 | Display message:  “Please enter duration less than 24 hours” | Display message:  “Please enter duration less than 24 hours” | Pass |

1. **Test Case for Edit Device**

| No. | Device | Device name | Power Usage(Wh) | Duration  (hours) | Duration  (minutes) | Expected output | Actual output | Pass/Fail |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | TV | Philips Smart TV | 300 | 2 | 30 | Display message:  “Device updated successfully” | Display message:  “Device updated successfully” | Pass |
| 2 | TV |  | 300 | 2 | 30 | Display message:  “Device added successfully” Device name will be defaulted to TV | Display message:  “Device added successfully” Device name will be defaulted to TV | Pass |
| 3 | TV | Philips Smart TV |  | 2 | 30 | Display message:  “Device added successfully” Power usage will be defaulted to previous data | Display message:  “Device added successfully” Power usage will be defaulted to previous data | Pass |
| 4 | TV | Philips Smart TV | 300 |  |  | Display message:  “Please enter duration for hours and minutes” | Display message:  “Please enter duration for hours and minutes” | Pass |
| 5 | TV | Philips Smart TV | 300 |  | 0 | Display message:  “Device added successfully” Duration will be 0 | Display message:  “Device added successfully” Duration will be 0 | Pass |
| 6 | TV | Philips Smart TV | 300 | 25 | 00 | Display message:  “Please enter duration less than 24 hours” | Display message:  “Please enter duration less than 24 hours” | Pass |

1. **Test Case for Energy Consumption Calculation**

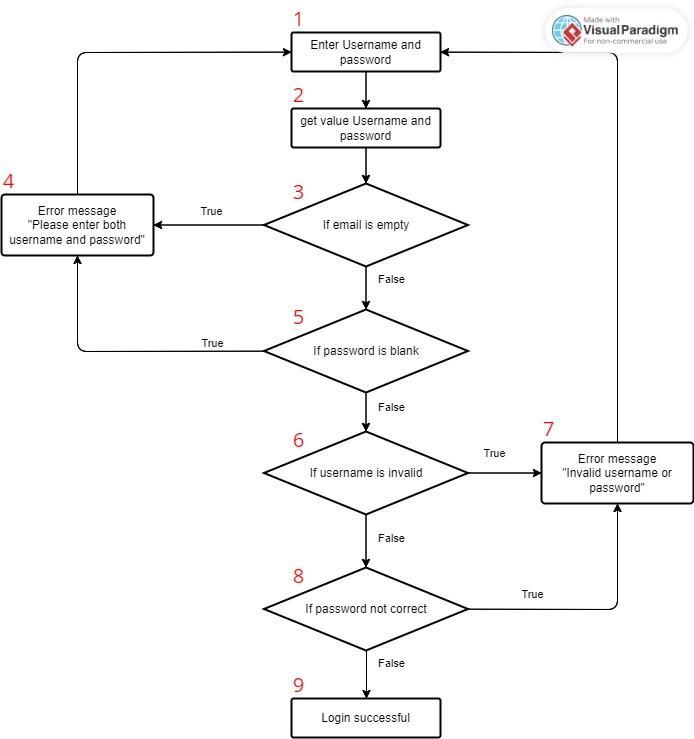
| No. | Device 1 | Power Usage(Wh) | Duration | Device 2 | Power Usage(Wh) | Duration | Expected output | Actual output | Pass/Fail |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 |  |  |  |  |  |  | Display message:  “No Devices” | Display message:  “No Devices” | Pass |
| 2 | TV | 300 | 5:30 | Oven | 500 | 2:00 | Display message:  “Power Usage 2.5 kWh daily consumption” | Display message:  “Power Usage 2.5 kWh daily consumption” | Pass |
| 4 | TV | 300 | 5:30 | Oven | 500 | 10:00 | Display message:  “Power Usage 6.5 kWh daily consumption” | Display message:  “Power Usage 6.5 kWh daily consumption” | Pass |

1. **Test Case for Energy Report**

| No. | Device 1 | Power Usage(Wh) | Duration | Device 2 | Power Usage(Wh) | Duration | Expected output | Actual output | Pass/Fail |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 |  |  |  |  |  |  | Display message:  “PDF save to download” | Display message:  “PDF save to download” | Pass |
| 2 | TV | 300 | 5:30 | Oven | 500 | 2:00 | Display message:  “PDF save to download” | Display message:  “PDF save to download” | Pass |
| 4 | TV | 300 | 5:30 | Oven | 500 | 10:00 | Display message:  “PDF save to download” | Display message:  “PDF save to download” | Pass |

**White Box testing: Basis path testing**

1. **Login**
   1. **Control Flow Graph**

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* 1. **Basis Path Testing**

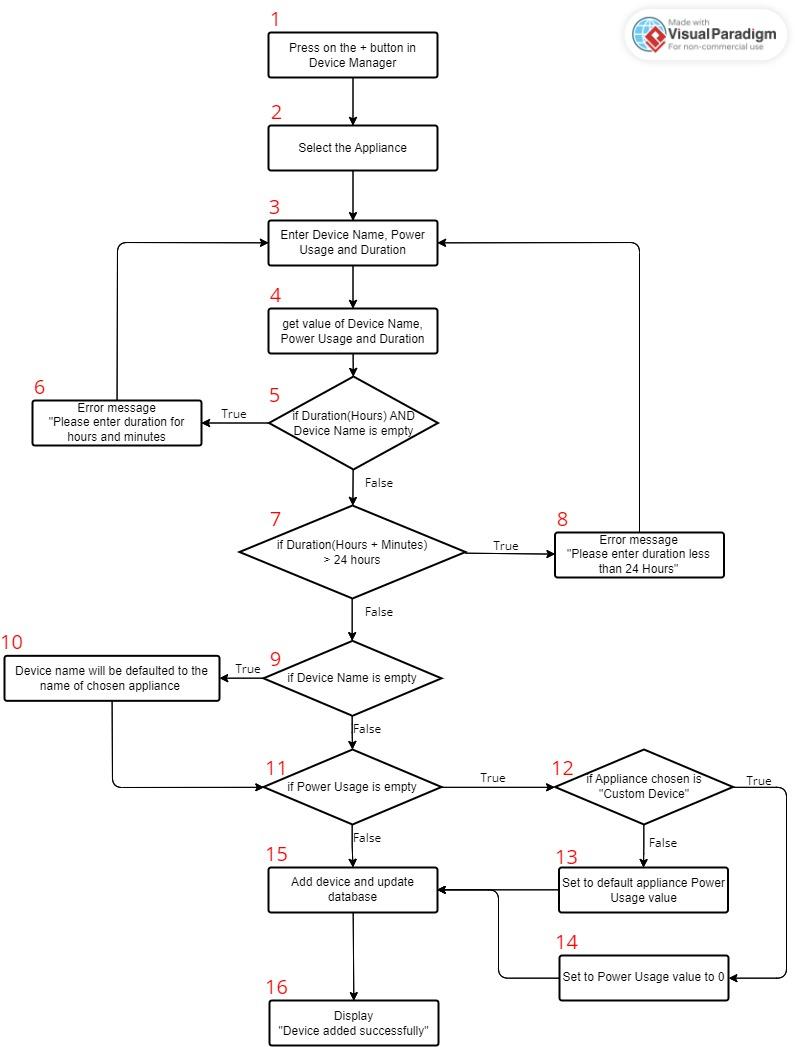
**Cyclomatic complexity** = 4 binary decision points +1 = 5

**Basic path:**

1. Baseline path: 1,2,3,5,6,8,9
2. Basis path: 1,2,3,4,1
3. Basis path: 1,2,3,5,4,1
4. Basis path: 1,2,3,5,6,7,1
5. Basis path: 1,2,3,5,6,8,7,1

| Path No. | Test input | Expected Output | Actual Output | Pass/Fail |
| --- | --- | --- | --- | --- |
| Path 1  (baseline) | User = “jack”  Password = “pass123” | Sent to Dashboard | Sent to Dashboard | Pass |
| Path 2 | User = “”  Password = “pass123” | Display message:  “Please enter both username and password” | Display message:  “Please enter both username and password” | Pass |
| Path 3 | User = “jack”  Password = “” | Display message:  “Please enter both username and password” | Display message:  “Please enter both username and password” | Pass |
| Path 4 | User = “random”  Password = “pass123” | Display message:  “Invalid username or password” | Display message:  “Invalid username or password” | Pass |
| Path 5 | User = “jack”  Password = “random” | Display message:  “Invalid username or password” | Display message:  “Invalid username or password” | Pass |

1. **Add Device**
   1. **Control Flow Graph**

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* 1. **Basis Path Testing**

**Cyclomatic complexity** = 5 binary decision points +1 = 6

**Basic path:**

1. Baseline path: 1,2,3,4,5,7,9,11,15,16
2. Basis path: 1,2,3,4,5,1
3. Basis path: 1,2,3,4,5,7,8,1
4. Basis path: 1,2,3,4,5,7,9,10,11,15,16
5. Basis path: 1,2,3,4,5,7,9,11,12,13,15,16
6. Basis path: 1,2,3,4,5,7,9,11,12,14

| Path No. | Device | Device name | Power Usage(Wh) | Duration  (hours) | Duration  (minutes) | Expected output | Actual output | Pass/Fail |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Path 1  (baseline) | TV | Philips Smart TV | 300 | 2 | 30 | Display message:  “Device added successfully” | Display message:  “Device added successfully” | Pass |
| Path 2 | TV | Philips Smart TV | 300 |  |  | Display message:  “Please enter duration for hours and minutes” | Display message:  “Please enter duration for hours and minutes” | Pass |
| Path 3 | TV | Philips Smart TV | 300 | 25 | 00 | Display message:  “Please enter duration less than 24 hours” | Display message:  “Please enter duration less than 24 hours” | Pass |
| Path 4 | TV |  | 300 | 2 | 30 | Display message:  “Device added successfully” Device name will be defaulted to TV | Display message:  “Device added successfully” Device name will be defaulted to TV | Pass |
| Path 5 | TV | Philips Smart TV |  | 2 | 30 | Display message:  Display message:  “Device power usage cannot be empty” | Display message:  Display message:  “Device power usage cannot be empty” | Pass |
| Path 6 | Custom Device | Philips Smart TV |  | 2 | 30 | Display message:  Display message:  “Device power usage cannot be empty” | Display message:  Display message:  “Device power usage cannot be empty” | Pass |