

## Patients Test Case

### Patients Menu

```
--- Patient Menu ---  
1. View Medical Record  
2. Update Personal Information  
3. View Available Appointment Slots  
4. Schedule an Appointment  
5. Reschedule an Appointment  
6. Cancel an Appointment  
7. View Scheduled Appointments  
8. View Past Appointment Outcome Records  
9. Logout
```

### Test Case 1: View Medical Record

- Clean State

```
=== Medical Record ===  
Patient ID: P1001  
Name: Alice Brown  
Date of Birth: 1980-05-14  
Gender: Female  
Blood Type: A+  
Contact Info: alice.brown@example.com  
Phone Number: N/A  
  
--- Diagnoses History ---  
N/A  
  
--- Treatments History ---  
N/A  
  
--- Past Appointments ---  
N/A
```

### Test Case 2: Update Personal Information

- Updating Contact Information

```
Choose an option: 2
Enter new contact information: (empty to keep current) brown.alice@example.com
Enter new phone number: (empty to keep current) 12345678
Updated contact information.
```

- Updated Medical Record

```
=== Medical Record ===
Patient ID: P1001
Name: Alice Brown
Date of Birth: 1980-05-14
Gender: Female
Blood Type: A+
Contact Info: brown.alice@example.com
Phone Number: 12345678

--- Diagnoses History ---
N/A

--- Treatments History ---
N/A

--- Past Appointments ---
N/A
```

- Failed to Update(Wrong Input Number)

```
Choose an option: 2
Enter new contact information: (empty to keep current) brown.alice@example.com
Enter new phone number: (empty to keep current) abc
Invalid input. Please enter a number.
```

- Failed to Update(Wrong Input Email)

```
Choose an option: 2
Enter new contact information (email): (empty to keep current) test
Invalid email format. Please enter a valid email address.
```

### Test Case 3: View Available Appointment Slots

- Select doctor to view for availability

```
Choose an option: 3

--- Available Doctors ---
0: Dr. John Smith (ID: D001)
1: Dr. Emily Clarke (ID: D002)
Enter the index of the doctor to view available slots (or 'E' to exit):
```

- When there's available slots

```
--- Available Slots for Dr. John Smith ---
0: 2024-11-14 @ 10:00
1: 2024-11-15 @ 10:00
```

- No available slots for that doctor

```
--- Available Doctors ---
0: Dr. John Smith (ID: D001)
1: Dr. Emily Clarke (ID: D002)
Enter the index of the doctor to view available slots (or 'E' to exit): 1
No available slots for Dr. Emily Clarke
```

- Wrong input for selecting doctor

```
--- Available Doctors ---
0: Dr. John Smith (ID: D001)
1: Dr. Emily Clarke (ID: D002)
Enter the index of the doctor to view available slots (or 'E' to exit): 2
Invalid index. Returning to the previous menu.
```

#### Test Case 4: Schedule an Appointment

- Scheduling an Appointment
- Display of time slot chosen and doctor that you selected

```
--- Available Slots for Dr. John Smith ---
0: 2024-11-14 @ 10:00
1: 2024-11-15 @ 10:00
Enter the index of available time slot to schedule: 0
Scheduled appointment for Alice Brown with Dr. John Smith at 2024-11-14 @ 10:00
```

- Other patients cannot view that slot anymore

```
--- Available Slots for Dr. John Smith ---
0: 2024-11-15 @ 10:00
```

- Wrong input

```
--- Available Slots for Dr. John Smith ---
0: 2024-11-15 @ 10:00
Enter the index of available time slot to schedule: 1
Invalid slot index. Returning to the previous menu.
```

### Test Case 5: Reschedule an Appointment

- Patient selecting which appointment to reschedule
- Here if status is pending, patient is still able to swap
- If status is confirm, patient cannot reschedule but have to cancel instead

```
--- Your Scheduled Appointments ---
0: Appointment ID: APT1731515714084, Time: 2024-11-14 @ 10:00, Status: Pending
Enter the index of the appointment to reschedule: 0
```

- Selecting which appointment to swap to
- Confirmation of rescheduled is displayed

```
--- Available Slots for Dr. John Smith ---
0: 2024-11-15 @ 10:00
Enter the index of available time slot to reschedule: 0
Scheduled appointment for Alice Brown with Dr. John Smith at 2024-11-15 @ 10:00
```

- Display of rescheduled appointment

```
--- Your Scheduled Appointments ---
Appointment ID: APT1731515714084, Time: 2024-11-15 @ 10:00, Status: Pending
```

- Wrong Input

```
--- Your Scheduled Appointments ---
0: Appointment ID: APT1731515714084, Time: 2024-11-15 @ 10:00, Status: Pending
Enter the index of the appointment to reschedule: 1
Invalid appointment index. Please try again.
```

### Test Case 6: Cancel an Appointment

- Selecting Appointment to cancel
- Able to cancel any appointment regardless of status in Confirmed or Pending
- Confirmation will be sent that it is cancelled

```
--- Your Scheduled Appointments ---
0: Appointment ID: APT1731515714084, Time: 2024-11-15 @ 10:00, Status: Pending
Enter the index of the appointment to cancel: 0
Appointment with ID APT1731515714084 has been canceled.
```

- Patient cannot see in his upcoming appointments
- Other patients can see it as an available slot

```
--- Your Scheduled Appointments ---
No available appointments for the patient.
```

```
--- Available Slots for Dr. John Smith ---
0: 2024-11-14 @ 10:00
1: 2024-11-15 @ 10:00
```

- Wrong input

```
--- Your Scheduled Appointments ---
0: Appointment ID: APT1731516981573, Time: 2024-11-15 @ 10:00, Status: Pending
Enter the index of the appointment to cancel: 1
Invalid index. Please select a number from the list.
```

### Test Case 7: View Scheduled Appointments

- Display upcoming appointments
- Display details like doctor name, date, time, and status
- If pending means doctor has not confirmed but if confirmed, status will change to confirmed and cannot be rescheduled

```
--- Your Scheduled Appointments ---  
Appointment ID: APT1731516981573, Time: 2024-11-15 @ 10:00, Status: Pending
```

## Test Case 8: View Past Appointment Outcome Records

- If no past record, it will display as such

```
--- Your Past Appointments ---  
No available appointments for the patient.
```

- If there is, it will display outcome record
- Details like services included, prescribed medication and consultation notes
- Medicine distribution needs to be confirmed by pharmacist as such current status at pending

```
--- Your Past Appointments ---  
===== Appointment Outcome =====  
Appointment Date: 2024-11-15  
Appointment ID: APT1731516981573  
Services: Consultation  
Prescription: 100 Medicines: Paracetamol x 1 Status: Pending  
Notes: Referred to SGH
```

## Doctors Test Case

### Doctors Menu

```
--- Doctor Menu ---  
1. View Patient Medical Records  
2. Update Patient Medical Records  
3. View Personal Schedule  
4. Set Availability for Appointments  
5. Accept or Decline Appointment Requests  
6. View Upcoming Appointments  
7. Record Appointment Outcome  
8. Logout  
Choose an option: █
```

### Test Case 9: View Patient Medical Records

- If no patients assigned to particular doctor, doctor would not be able to view any patient records
- Patients appointment must be confirmed by doctor to be able to view records

```
Choose an option: 1
No patients assigned.
```

- Doctor is able to see the most updated medical record of the patient
- Any past diagnosis, treatment and appointments will be displayed if there are any

```
--- Assigned Patients ---
0: Patient Name: Alice Brown, ID: P1001
Choose patient index to view medical records: 0
Medical Record for Patient ID: P1001
=== Medical Record ===
Patient ID: P1001
Name: Alice Brown
Date of Birth: 1980-05-14
Gender: Female
Blood Type: A+
Contact Info: alice.brown@example.com
Phone Number: 12345678

--- Diagnoses History ---
N/A

--- Treatments History ---
N/A

--- Past Appointments ---
N/A
```

### Test Case 10: Update patient Medical Records

- Doctor has the option to add either a new diagnosis,treatment as well as prescription

```
--- Assigned Patients ---
0: Patient Name: Alice Brown, ID: P1001
Choose patient index to update medical records: 0
1. Add Diagnosis
2. Add Treatment
3. Add Prescription
Choose an option: 2
```

- Each of the options will display a message when diagnosis, treatment and prescription is added successfully

```
Enter Diagnosis ID: 100
Enter Diagnosis Details: Fever
Diagnosis added to medical record for Patient ID: P1001
```

```
Enter Treatment ID: 101
Enter Treatment Details: Nil
Treatment added to medical record for Patient ID: P1001
Treatment added successfully.
```

```
Enter Prescription ID: 100

=== Inventory ===
0: Name: Paracetamol
1: Name: Ibuprofen
2: Name: Amoxicillin
Enter the index of the medicine to add (or -1 to finish): 0
Enter quantity for Paracetamol: 1
Added: Paracetamol (Quantity: 1)
Enter the index of the medicine to add (or -1 to finish): -1
Prescription added to medical record for Patient ID: P1001
Prescription added successfully to patient record.
Prescription added: 100 Medicines: Paracetamol x 1 Status: Pending
Prescription added to PrescriptionManager for pharmacist access.
```

- Afterwards it will be updated in medical records for doctors to refer to whenever a patient schedules an appointment with another doctor in the future

```
--- Assigned Patients ---
0: Patient Name: Alice Brown, ID: P1001
Choose patient index to view medical records: 0
Medical Record for Patient ID: P1001
=== Medical Record ===
Patient ID: P1001
Name: Alice Brown
Date of Birth: 1980-05-14
Gender: Female
Blood Type: A+
Contact Info: alice.brown@example.com
Phone Number: 12345678

--- Diagnoses History ---
2024-11-14 01:26 - Diagnosis ID: 100, Notes: Fever

--- Treatments History ---
2024-11-14 01:26 - Treatment ID: 101, Description: Nil

--- Past Appointments ---
===== Appointment Outcome =====
Appointment Date: 2024-11-15
Appointment ID: APT1731516981573
Services: Consultation
Prescription: 100 Medicines: Paracetamol x 1 Status: Pending
Notes: Referred to SGH
=====
```



### Test Case 11: View Personal Schedule

- We given two appointment timings for this doctor and since one was already booked by a patient
- His personal schedule will display his available appointment timing and his upcoming appointment as well

```
--- Available Timeslots ---
2024-11-16 @ 10:00

--- Upcoming Appointments ---
Appointment ID: APT1731522381021, Patient ID: P1001, Scheduled Time: 2024-11-15 @ 10:00
```

### Test Case 12: Set Availability for Appointments

- Doctor is able to set a new date and time as an available slot
- If the date is invalid( current day has already passed) error will pop up

```
Enter availability date (YYYY-MM-DD): 2024-11-20
Enter time (HH:MM): 10:00
New availability added for Dr.John Smith: 2024-11-20 @ 10:00
```

```
Choose an option: 4
Enter availability date (YYYY-MM-DD): 2001-01-25
Invalid date. Please enter a date that is today or later.
```

- Patients are able to view the new appointment slot as an option
- 2024-11-20 @ 10:00 is listed in available slots for the doctor for patients to see as an option

```
--- Available Slots for Dr. John Smith ---
0: 2024-11-16 @ 10:00
1: 2024-11-20 @ 10:00
Enter the index of available time slot to schedule: █
```

### Test Case 13: Accept or Decline Appointment Requests

- When doctor choose to accept, it changes the status to confirmed for the appointment in the patients account

```
--- Appointment Requests ---
0: Appointment ID: APT1731522381021, Time: 2024-11-15 @ 10:00, Status: Pending
Select appointment index to manage: 0
Accept or Decline (A/D): A
Appointment APT1731522381021 accepted.
```

```
--- Your Scheduled Appointments ---
Appointment ID: APT1731522381021, Time: 2024-11-15 @ 10:00, Status: Confirmed
```

- When doctor declines instead, it reflects declined under status of the appointment in the patients account

```
--- Your Scheduled Appointments ---
Appointment ID: APT1731524823017, Time: 2024-11-16 @ 10:00, Status: Declined
```

## Test Case 14: View Upcoming Appointments

- Reflects any upcoming appointments that the doctor has accepted

```
Choose an option: 6
Appointment ID: APT1731522381021, Time: 2024-11-15 @ 10:00, Status: Confirmed
```

## Test Case 15: Record Appointment Outcome

- Doctor can add services provided and whether there are any additional notes
- Prescription is added as well to show what medicine the patient needs and for the pharmacist to refer to

```
--- Confirmed Appointments ---
0: Appointment ID: APT1731522381021, Time: 2024-11-15 @ 10:00, Status: Confirmed
Select appointment index to record an outcome: 0
Enter services provided: Consultation
Enter any additional notes: Referred to SGH
Do you want to add a prescription? (Y/N): Y

=== Inventory ===
0: Name: Paracetamol
1: Name: Ibuprofen
2: Name: Amoxicillin
Enter the index of the medicine to add (or -1 to finish): 0
Enter quantity for Paracetamol: 1
Added 1 units of Paracetamol to prescription.

=== Inventory ===
0: Name: Paracetamol
1: Name: Ibuprofen
2: Name: Amoxicillin
Enter the index of the medicine to add (or -1 to finish): -1
Appointment outcome added to medical record for Patient ID: P1001
Prescription added: Pres1731525153333 Medicines: Paracetamol x 1 Status: Pending
Appointment outcome recorded successfully.
```

- The outcome is then reflected in patients account under “View Past Appointment Outcome Records”
- Status is shown as pending as it requires the pharmacist input to confirm it

```

--- Your Past Appointments ---
===== Appointment Outcome =====
Appointment Date: 2024-11-15
Appointment ID: APT1731522381021
Services: Consultation
Prescription: Pres1731525153333 Medicines: Paracetamol x 1 Status: Pending
Notes: Referred to SGH
=====

```

## Pharmacist Test Case

### Pharmacist Menu

```

--- Pharmacist Menu ---
1. View Prescription Records
2. View Pending Prescription Records
3. Update Prescription Status
4. View Medication Inventory
5. Submit Replenishment Request
6. View Replenishment Requests
7. Logout

```

### Test Case 16: View Appointment Outcome Record

- Pharmacist are able to view prescription record to process and verify the prescribed medication for the patient

```

Prescription Records:
Pres1731525153333 Medicines: Paracetamol x 1 Status: Pending

```

### Test Case 17: Update Prescription Status

- Pharmacist can change the status of pending to dispensed when medicine has been distributed
- Inventory of the medicine dispensed will be deducted accordingly

```
--- Prescription Records ---
0: Pres1731525153333 Medicines: Paracetamol x 1 Status: Pending
Enter the index of the prescription to update status: 0
Prescription Pres1731525153333 status updated to Dispensed.
Deducted 1 units of Paracetamol. Remaining stock: 99
```

- Status of medicine dispensed is also reflected in patient's "View Past Appointment Outcome Record"

```
--- Your Past Appointments ---
===== Appointment Outcome =====
Appointment Date: 2024-11-15
Appointment ID: APT1731522381021
Services: Consultation
Prescription: Pres1731525153333 Medicines: Paracetamol x 1 Status: Dispensed
Notes: Referred to SGH
```

### Test Case 18: View Medication Inventory

- In the inventory not only do we show the stocks available, an alert level for each particular medicine is displayed to be more cautious and ensure the right amount of medicine is dispensed

```
=== All Medicines ===
Name: Paracetamol, Stock: 99, Alert Level: 120
Name: Ibuprofen, Stock: 50, Alert Level: 10
Name: Amoxicillin, Stock: 75, Alert Level: 15
```

### Test Case 19: Submit Replenishment Request

- Pharmacist can submit request to restock on medicine, status will stay pending till approved by administrator

```
--- Medicine Inventory ---
0: Paracetamol - Current Stock: 99
1: Ibuprofen - Current Stock: 50
2: Amoxicillin - Current Stock: 75
Enter the index of the medicine for replenishment: 0
Enter amount to replenish for Paracetamol: 1
Replenishment Request Submitted: 1 units of Paracetamol
```

## Administrator Test Cases

### Administrator Menu

```
--- Administrator Menu ---
1. Manage Hospital Staff
2. Manage Medication Inventory
3. Approve Replenishment Requests
4. View Appointments Detail
5. Logout
Choose an option: █
```

### Test Case 20: View and Manage Hospital Staff

- We have added some extra feature where we can not only view all the current staffs working at the hospital but also filter to find them easier

```
--- Staff Management Menu ---
1. Add New Staff
2. Update Staff
3. Remove Staff
4. View All Staff
5. Filter Staff
6. Return
Enter an action (1-6): █
```

- Adding of staff

```
Enter an action (1-6): 1
Enter User ID: D004
Enter Password: pwd
Enter Name: Jeremy Tan
Enter Gender (Male/Female): Male
Enter Role (Doctor/Pharmacist): Doctor
Enter Age: 60
Staff member added: Jeremy Tan (ID: D004)
```

- Removing of staff

- Patients will not be able to view the removed staff member as well

```

--- All Staff Members ---
0: ID: D001, Name: John Smith, Role: Doctor
1: ID: D002, Name: Emily Clarke, Role: Doctor
2: ID: P001, Name: Mark Lee, Role: Pharmacist
3: ID: A001, Name: Sarah Lee, Role: Administrator
4: ID: D004, Name: Jeremy Tan, Role: Doctor
Enter the index of the Staff to Remove: 1
Staff member with ID D002 removed.

```

- Emily Clarke not shown when patients want to book appointment but can see the newly added staff Jeremy Tan
- The updates are also reflected in the Admin account

```

--- Available Doctors ---
0: Dr. John Smith (ID: D001)
1: Dr. Jeremy Tan (ID: D004)
Enter the index of the doctor to schedule an appointment: █

```

```

--- All Staff Members ---
ID: D001, Name: John Smith, Role: Doctor, Gender: Male, Age: 45
ID: P001, Name: Mark Lee, Role: Pharmacist, Gender: Male, Age: 29
ID: A001, Name: Sarah Lee, Role: Administrator, Gender: Female, Age: 40
ID: D004, Name: Jeremy Tan, Role: Doctor, Gender: Male, Age: 60

```

## Test Case 21: View Appointment Details

- Admins are able to view any appointment tracked in the system regardless of status and displays the same details that doctors and patients have access to

```

All Appointments in the System:

Appointment ID: APT1731522381021, Time: 2024-11-15 @ 10:00, Status: Completed
--- Appointment Outcome ---
Services Provided: Consultation
Additional Notes: Referred to SGH
Prescription ID: Pres1731525153333 Medicines: Paracetamol x 1 Status: Dispensed

Appointment ID: APT1731524823017, Time: 2024-11-16 @ 10:00, Status: Declined

```

## Test Case 22: View and Manage Medication Inventory

- Admin has full access to medicine inventory where they can even update each medicine alert level, stocks, or completely add or remove a medicine.

```
--- Medicine Management ---
1. View All Medicines
2. Add New Medicine
3. Update Medicine Stock
4. Update Stock Alert Level
5. Remove Medicine
6. Return
Choose an option (1-6): █
```

- When view all medicine, the system will display the most updated stock level
- Here Paracetamol is at 99 from 100 as 1 was recently dispensed to a patient

```
Choose an option (1-6): 1

=== All Medicines ===
Name: Paracetamol, Stock: 99, Alert Level: 120
Name: Ibuprofen, Stock: 50, Alert Level: 10
Name: Amoxicillin, Stock: 75, Alert Level: 15
```

## Test Case 23: Approve Replenishment Requests

- Admin can see when pharmacist requests for a restock of medicine and they can agree to the requests or do it directly themselves
- They will show the updated stock level of the replenished medicine

```
Choose an option: 3
Pending Replenishment Requests:
0: Request ID: R1411033401, Medicine: Paracetamol, Requested Amount: 1, Status: Pending
Enter the index of the replenishment request to approve: 0
Stock replenished. 1 stocks added to Paracetamol. New amount: 100
Replenishment request R1411033401 has been approved.
```

- The updated stock level is also reflected in the admin and pharmacist account
- The request in pharmacist account status will be changed to approved as well

```
=== All Medicines ===
Name: Paracetamol, Stock: 100, Alert Level: 120
Name: Ibuprofen, Stock: 50, Alert Level: 10
Name: Amoxicillin, Stock: 75, Alert Level: 15
```

```
Choose an option: 6
Replenishment Requests by Pharmacist:
Request ID: R1411033401, Medicine: Paracetamol, Amount: 1, Status: Approved
```

## Login System and Password Management Test Case

### Test Case 25: First-Time Login and Password Change

```
Enter User ID (or 'E' to exit): P1001
Enter Password: pwd
Login successful for user: Alice Brown
This is your first login. You need to change your password.
Enter new password: NTU
Confirm new password: NTU
Password updated successfully.
```

- Here we show that password is updated successfully

```
Choose an option: 9
You have been logged out.
Enter User ID (or 'E' to exit): P1001
Enter Password: NTU
Login successful for user: Alice Brown
```

### Test Case 26: Login with Incorrect Credentials

```
Enter User ID (or 'E' to exit): P1001
Enter Password: pwd
Invalid credentials. Please try again.
Enter User ID (or 'E' to exit):
```



