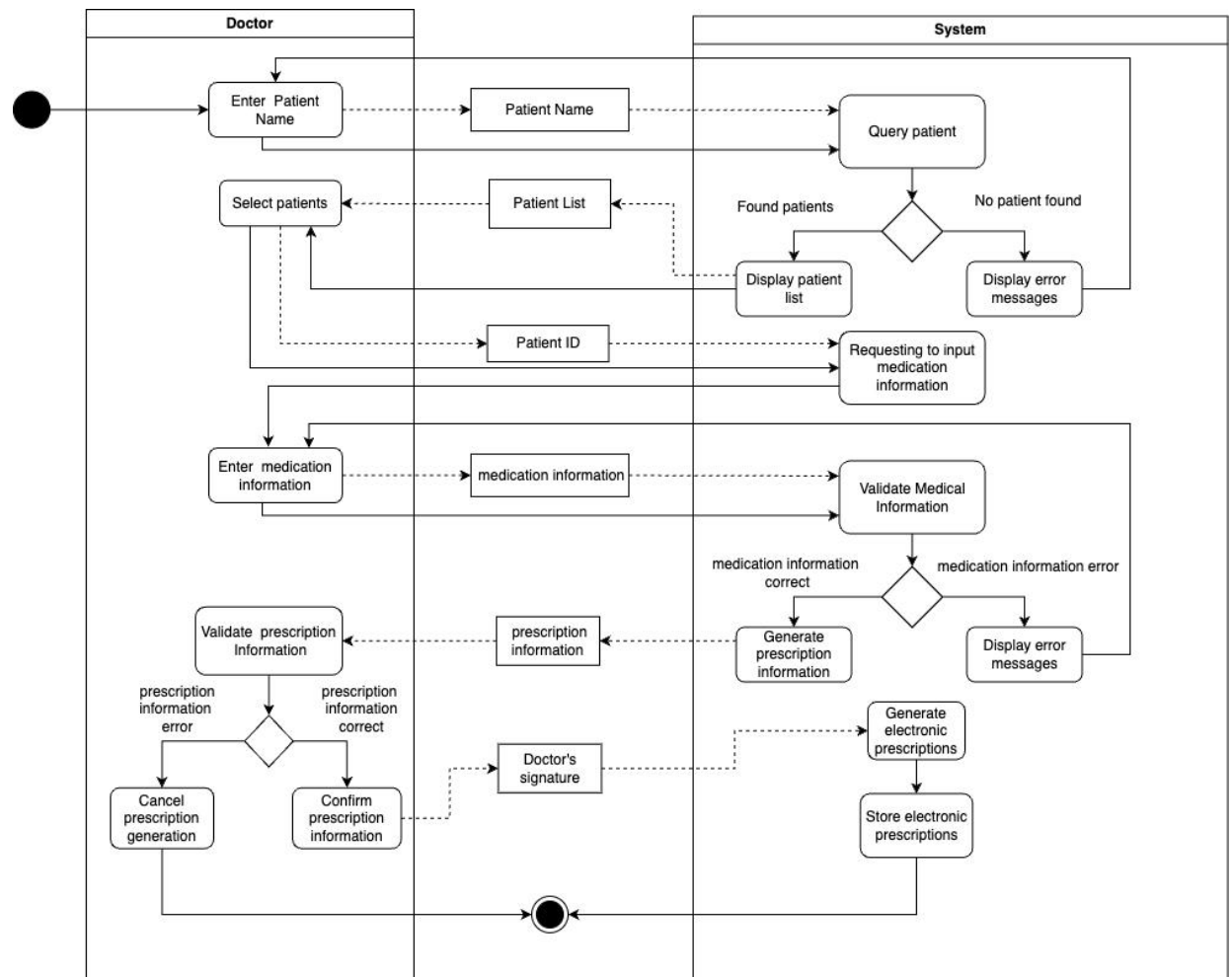
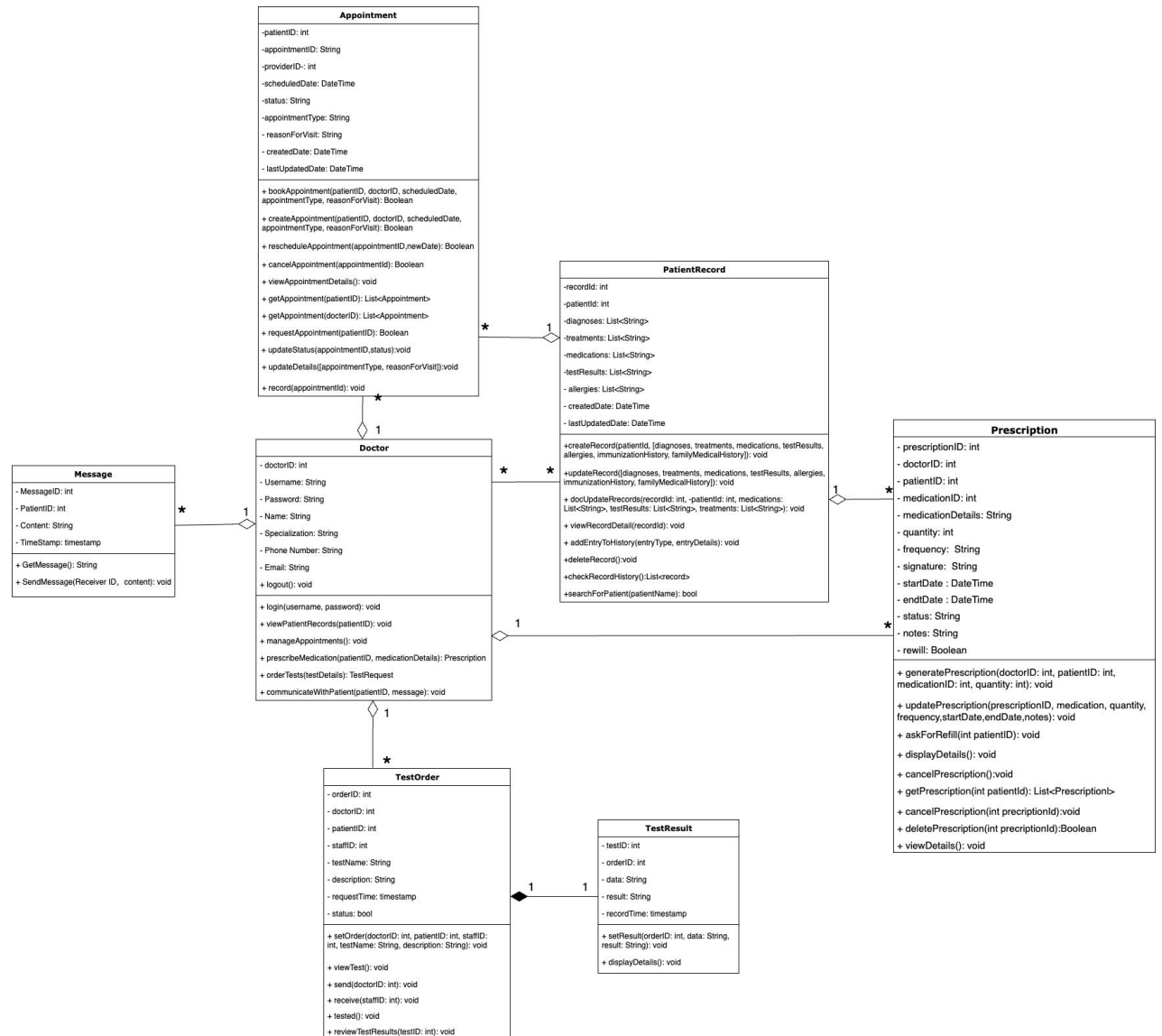


## Task 1: Software Modelling and Specification

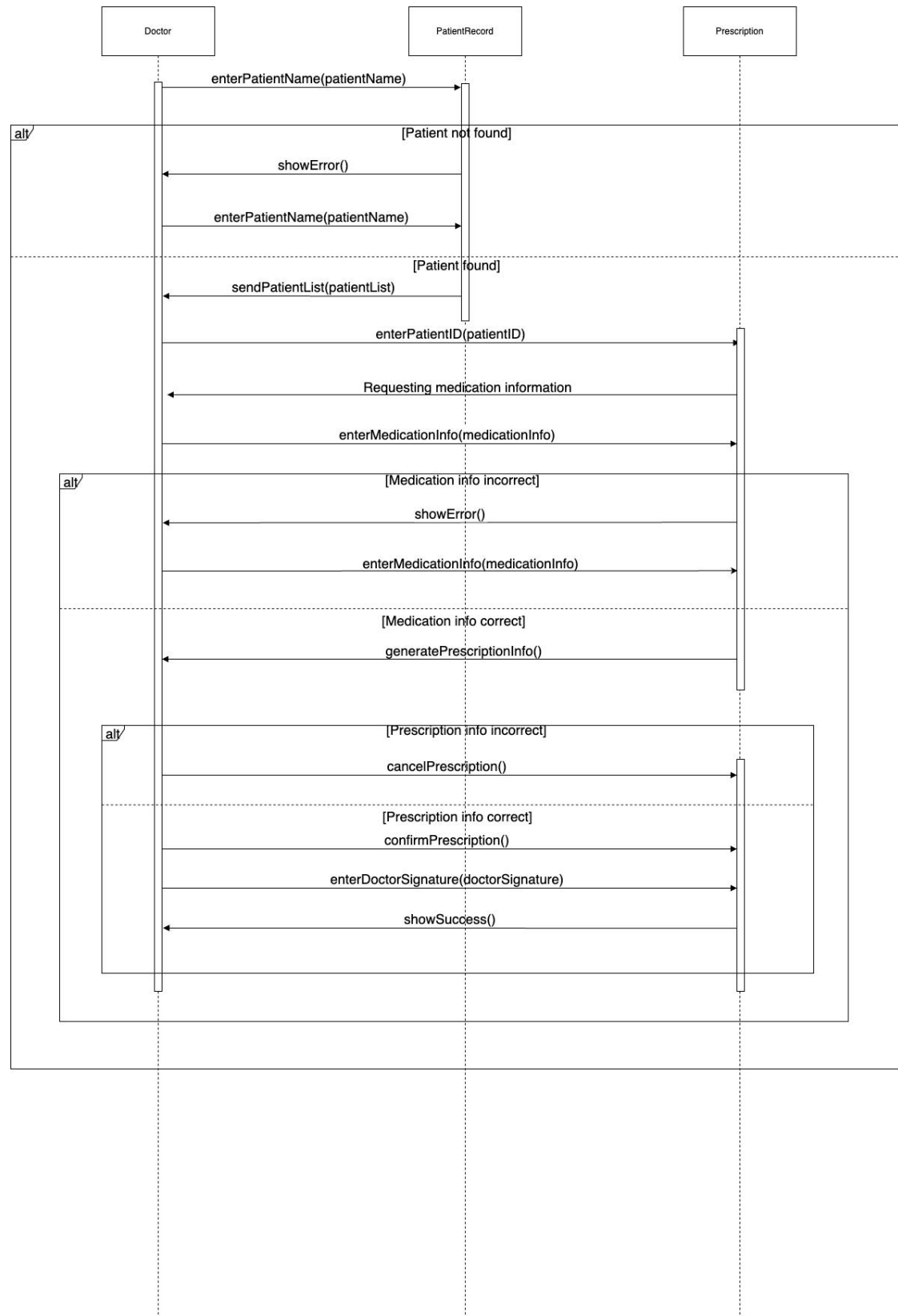
### (b) Activity Model



## (c) Structural Model

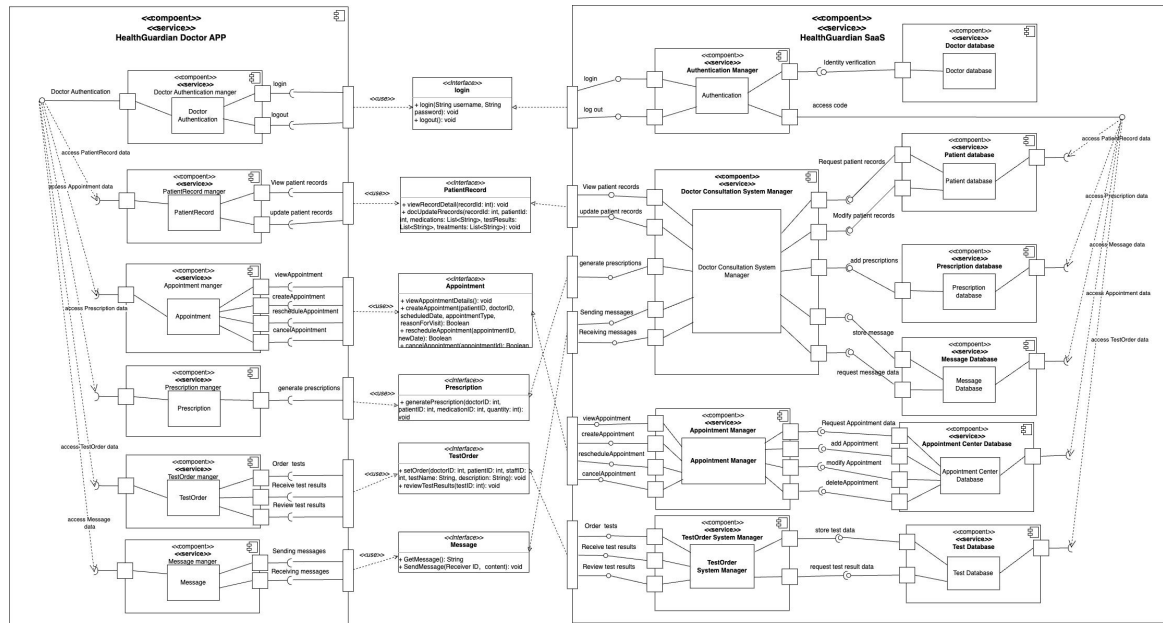


#### (d) Behaviour Model



## Task 2: Software Architectural Design

### (b) Architecture of the subsystem



## Task 2: Software Architectural Design (Table)

### Component Table

Component	Doctor Authentication Manger
Description	This is a subsystem of the HealthGuardian Doctor APP running on the cloud to process doctor's requests related to authentication.
Type	Health Guardian Doctor APP
Required Interfaces:	Login, Logout
Provided Interfaces:	Doctor Authentication

Component	PatientRecord manger
Description	This is a subsystem of the HealthGuardian Doctor APP running on the cloud to process doctor's requests related to View and update patient records.
Type	Health Guardian Doctor APP
Required Interfaces:	View patient records, update patient records, Doctor Authentication
Provided Interfaces:	none

Component	Appointment manger
Description	This is a subsystem of the HealthGuardian Doctor APP running on the cloud to process doctor's requests related to manage appointment schedules.
Type	Health Guardian Doctor APP
Required Interfaces:	viewAppointment, createAppointment, rescheduleAppointment, cancelAppointment, Doctor Authentication
Provided Interfaces:	none

Component	Prescription manger
Description	This is a subsystem of the HealthGuardian Doctor APP running on the cloud to process doctor's requests related to generate electronic prescriptions.
Type	Health Guardian Doctor APP
Required Interfaces:	generate prescriptions, Doctor Authentication
Provided Interfaces:	none

Component	TestOrder manger
Description	This is a subsystem of the HealthGuardian Doctor APP running on the cloud to process doctor's requests related to order diagnostic tests and receive and review test results.
Type	Health Guardian Doctor APP
Required Interfaces:	Order tests, Receive test results, Review test results, Doctor Authentication
Provided Interfaces:	none

Component	Message manger
Description	This is a subsystem of the HealthGuardian Doctor APP running on the cloud to process doctor's requests related to messaging or communication with patients.
Type	Health Guardian Doctor APP
Required Interfaces:	Sending messages, Receiving messages, Doctor Authentication
Provided Interfaces:	none

Component	Authentication Manager
Description	This is a subsystem of the HealthGuardian Doctor APP running on the cloud to process doctor's requests related to messaging or communication with patients.
Type	HealthGuardian SaaS
Required Interfaces:	Sending messages, Receiving messages, Doctor Authentication
Provided Interfaces:	Login, Logout

Component	Doctor Consultation System Manager
Description	This is a subsystem of the HealthGuardian Doctor APP running on the cloud to process doctor's requests related to View and update patient records, generate prescriptions, Communicate with Patient.
Type	HealthGuardian SaaS
Required Interfaces:	Request patient records, Modify patient records, add prescriptions, store message, request message data
Provided Interfaces:	View patient records, update patient records, generate prescriptions, Sending messages, Receiving messages

Component	Appointment Manager
Description	This is a subsystem of the HealthGuardian Doctor APP running on the cloud to process doctor's requests related to manage appointment schedules.
Type	HealthGuardian SaaS
Required Interfaces:	Request Appointment data, add Appointment, modify Appointment, deleteAppointment
Provided Interfaces:	viewAppointment, createAppointment, rescheduleAppointment, cancelAppointment

Component	TestOrder System Manager
Description	This is a subsystem of the HealthGuardian Doctor APP running on the cloud to process doctor's requests related to order diagnostic tests and receive and review test results.
Type	HealthGuardian SaaS
Required Interfaces:	store test data, store test result data,request test result data,
Provided Interfaces:	Order tests, Receive test results, Review test results

Interface Table

Interface Name	login
Provider	Health Guardian Saas
	Operation: login
	Request Parameters: String username, String password. Response parameters: void Function: Check if the doctor's password matches the stored password, and if so, return accessCode; Otherwise, an error message will be displayed
	Operation: logout
	Request Parameters: none Response parameters: void Function: After the doctor clicks on exit, execute exit

Interface Name	PatientRecord
Provider	Health Guardian Saas
	Operation: viewRecordDetail
	Request Parameters: int recordId Response parameters: void Function: By calling this method, doctors can obtain specific records and information about patients in order to better understand their medical history, condition, and treatment plan
	Operation: docUpdateRrecords
	Request Parameters: recordId: int, patientId: int, medications: List<String>, testResults: List<String>, treatments: List<String> Response parameters: void Function: Through this method, doctors can update data, including treatment courses, test results, etc., based on the selected patients and their corresponding patient records.

Interface Name	Appointment
Provider	Health Guardian Saas
	Operation: viewAppointmentDetails
	Request Parameters: none Response parameters: void Function: This method is mainly used by doctors when viewing appointments, and the system calls the data to display the appointment information of the doctor.
	Operation: createAppointment
	Request Parameters: patientID, doctorID, scheduledDate, appointmentType, reasonForVisit. Response parameters: Boolean Function: This method is mainly used by doctors when creating appointments, and doctors need to input corresponding information to create appointments.
	Operation: rescheduleAppointment
	Request Parameters: appointmentID, newDate Response parameters: Boolean Function: This method is mainly used by doctors when modifying appointments. Doctors modify appointment data by entering corresponding information.
	Operation: cancelAppointment
	Request Parameters: appointmentId Response parameters: Boolean Function: This method is mainly used when doctors cancel appointments. Doctors cancel appointments by entering their appointment ID, and then the database will delete appointment.

Interface Name	Prescription
Provider	Health Guardian Saas
	Operation: generatePrescription
	Request Parameters: doctorID: int, patientID: int, medicationID: int, quantity: int. Response parameters: void Function: This method is mainly used by doctors when generating prescriptions. Doctors create electronic prescriptions by inputting patient, drug, and other information.



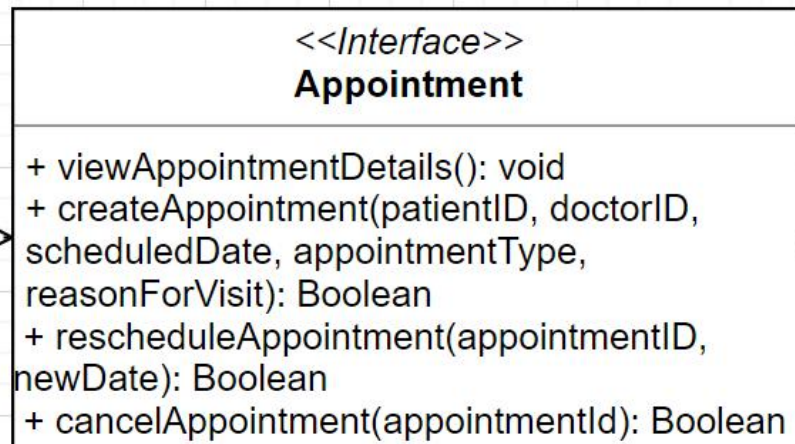
Interface Name	TestOrder
Provider	Health Guardian Saas
	<p>Operation: setOrder</p> <p>Request Parameters: doctorID: int, patientID: int, staffID: int, testName: String, description: String.</p> <p>Response parameters: void</p> <p>Function: This method is mainly used when doctors request testing, where doctors create a test by entering corresponding information.</p>
	<p>Operation: reviewTestResults</p> <p>Request Parameters: testID: int</p> <p>Response parameters: void</p> <p>Function: This method is mainly used by doctors to view test results, where they enter TestID to view the test results.</p>

Interface Name	Message
Provider	Health Guardian Saas
	<p>Operation: GetMessage</p> <p>Request Parameters: none</p> <p>Response parameters: String</p> <p>Function: This method is mainly used by doctors to communicate with patients and obtain information transmitted by users through this method.</p>
	<p>Operation: SendMessage</p> <p>Request Parameters: Receiver ID, content</p> <p>Response parameters: void</p> <p>Function: This method is mainly used for doctors to communicate with patients, and to send user transmitted information through this method.</p>

### Task 3: Test

(a) . Unit test plan:

The test case interface



Test Cases for createAppointment Method:

Test Case	Method and Parameters	Expected output
Successful Appointment Creation	createAppointment(101, 201, "2023-12-15", "General Checkup", "Yearly physical")	Appointment object
Create with Invalid Doctor ID	createAppointment(101, -1, "2023-12-15", "General Checkup", "Yearly physical")	Error message
Create with Past Date	createAppointment(101, 201, "2022-12-15", "General Checkup", "Yearly physical")	Error message

Test Cases for rescheduleAppointment Method:

Test Case	Method and Parameters	Expected output
Successful Reschedule	rescheduleAppointment("2023-12-20")	Method call with no return value
Reschedule to Past Date	rescheduleAppointment("2022-12-20")	Error message

Test Cases for cancelAppointment Method:

Test Case	Method and Parameters	Expected output
Successful Cancellation	cancelAppointment(123)	Method call with no return value
Cancel Non-existent Appointment	cancelAppointment(999)	Error message

Test Cases for viewAppointmentDetails Method:

Test Case	Method and Parameters	Expected output
View Details	viewAppointmentDetails()	Method call with no return value (side effects expected)

(b) System test plan:

Use case: Manage Appointment Scheduling

Scenario: Creating an Appointment

Test Progress:

Doctor	System (HealthGuardian SaaS)
Doctor selects the option to create a new appointment.	System presents the appointment creation form.
Doctor enters patient ID, own ID, date, type, and reason for the visit and submits.	System validates the data and schedules the appointment.
Doctor awaits confirmation of the appointment.	System generates an appointment ID and confirms the appointment with the doctor.
Doctor receives the appointment ID and details.	System logs the creation of the appointment.

Test data:

Input: patientId = 101, doctorId = 201, scheduledDate = "2023-12-15",  
appointmentType = "General Checkup", reasonForVisit = "Yearly physical"

Expected Output: Appointment ID and confirmation

### Scenario: Rescheduling an Appointment

#### Test Progress:

Patient	System
Doctor selects an existing appointment to reschedule.	System retrieves the appointment details.
Doctor provides a new date for the appointment and submits the change.	System validates the new date and reschedules the appointment.
Doctor awaits confirmation of the reschedule.	System updates the appointment details and confirms the change.
Doctor receives the updated appointment information.	System logs the rescheduling of the appointment.

#### Test Data:

Input: newDate = "2023-12-20"

Expected Output: Confirmation of rescheduling

### Scenario: Canceling an Appointment

#### Test Progress:

Doctor	System (HealthGuardian SaaS)
Doctor decides to cancel an appointment and selects it from the schedule.	System retrieves the selected appointment's details.
Doctor confirms the cancellation.	System processes the cancellation request.
Doctor awaits confirmation of the cancellation.	System confirms the cancellation and updates the schedule accordingly.
Doctor receives confirmation that the appointment has been canceled.	System logs the cancellation of the appointment.

#### Test data:

Input: appointmentId = 123

Expected Output: Confirmation of cancellation