# Project 2: Build an E-Commerce back-end (SOAP Version)

You are going to build the back-end of a web E-Commerce site to a specification providing SOAP services.

Given the methods and other specifications for a SOAP service, you need to build the mid-tier services layer and business layer. You will be given data layer in order to make it functional and a sample class to show its usage. Since this is not a real project, you won’t have to worry about authentication, access control or encryption. You do however have to validate all input.

If you do this correctly, your next project will be much simpler as we will be reusing the data and business layers. All you should need to change for the next project should be the service layer (and a couple of small changes to the business layer).

# Requirements

* You will need to implement a SOAP service that returns XML **Strings** written in Java for the description and Use Case 1 below (has Business Layer rules) plus the SOAP service **with the following methods** (Sample output is included at the end):
* initialize() – Initialize the database (this may require a server restart after running if you get server errors).
* getAllAppointments() –Return a list of all appointments and related information.
* getAppointment(String appointNumber) – Return a specific appointment and related information.
* addAppointment(String xmlStyle) – Create a new appointment providing the required information in XML and receiving XML or error message.
* The XML strings you produce and consume MUST MATCH the samples included at the end.
* You must use the provided Data Layer (includes an embedded database). There is a test class provided in the zip file that has an example of how to use the Data Layer and what jar files are to be imported into your classes. Also in that zip file is a folder containing html documentation on the model classes used in the data layer. Valid table names for use with the Data Layer are (watch the capitalization): Appointment, AppointmentLabTest, PSC, Patient, Physician, Phlebotomist, LabTest, Diagnosis.
* **Method names must match those above**
* **Your @WebService annotation must name the service: LAMSAppointmentService**
* **YOUR sun-web.xml FILE MUST SET THE CONTEXT TO BE:**

/YourLastNameYourFirstInitialP2

Example: /FrenchBP2

* **Some Hints:**
* You will need to create a jGrasp project with a folder structure matching your package structure. You must use at least two packages: one for the business layer and one for the service layer.
* If you want to test your project before “Soapifying” it, you will need a class with a main method. You cannot use that main method or the TestDB class once the project is deployed, you have to use your service methods.
* You will need to include a lib directory in your WEB-INF folder that contains all of the jar files provided for you as well as adding them to the classpath in jGrasp project.
* Copy all of your package directories (the .class files) into the same structure under the WEB-INF->classes folder.
* The structure for the WEB-INF folder should have two folders under it: “classes” and “lib” and a web.xml and a sun-web.xml file. “classes” should have a folder for each package under it and the corresponding .class files in those folders. The “lib” folder should contain all of the provided jar files and any additional jar files you may need for classes you use.
* jar cvf yourLastNameSoapService.war WEB-INF from the directory just above the WEB-INF directory.
* There is an object for each table and most of those objects have accessors/mutators for each column. The ones that are different are the ones that are the composite tables (e.g. AppointmentLabTest) which have methods to get the corresponding objects that are joined via that object (e.g. Diagnosis and LabTest for AppointmentLabTest).
* You need a way to determine what the next appointment id will be when adding an appointment.
* You may have to restart the server after running the initialize() method if you are getting server errors.
* You may have to request an operation again if the server returns an error (if this happens repeatedly and for all operations, restart the server)

Then to test it, use the generated test client or SoapUI. Copy and paste the new appointment from the project 5 description.

* **DUE DATE: @ 11:59 PM on the date on the Dropbox in MyCourses)**
* **You need to provide: A “war” file of your project, your project in zip format and any jar files that you added. The war file name should be: YourLastnameYourFirstInitialP2.war**
* **You need to upload the war file using:** [**http://bdfvks-docker.ist.rit.edu:8585**](http://bdfvks-docker.ist.rit.edu:8585) **(Note: you can test this by going to: http://bdfvks-docker.ist.rit.edu:8080/YourLastnameYourFirstInitialP2/LAMSAppointmentService?WSDL )**
* **Paste this link in the dropbox comments.**

# Grading

An excellent project (worthy of an A) will have everything I’m asking for here, plus something extra - evidence that you intend to excel. Perhaps more resource pairs such as listing all patients/a specific patient, all doctors, etc. or would merit me recommending you to a client who needed similar work done on a project.

To do better…

* Good, reusable code –
* Extend Functionality
* High Level of Technical Development
* Surprise me…
* **MAKE SURE YOU POINT OUT IN THE COMMENTS SECTION OF THE DROPBOX WHAT YOUR ABOVE AND BEYOND ARE!!!**

## Laboratory Appointment Management System Requirements

### **Background Information**

Cellular Won Laboratories (CWL) is an independently owned and operated full-service medical laboratory located in “sunny” Upstate NY. Cellular Won serves over 500,000 patients annually, processing on average, 200,000 lab tests per month.

Cellular Won currently employs 350 of the regions most highly qualified professionals specializing in cytology, hematology, toxicology, pathology, histology, microbiology, clinical trials, and occupational laboratory testing. Most testing is performed in-house, however, a few specialty tests are performed by outside laboratories. Cellular Won operates 25 conveniently located Patient Service Centers across New York State, where highly trained specialists make the customer experience a positive one, always.

**Problem Statement**

Cellular Won’s volume of laboratory testing has increased 40% each year over the past 10 years. The volume of tests performed is up and revenues are down, due in part to the high dollar value of aged accounts receivable (unpaid bills). This steady incline in demand, along with antiquated processes and technologies, has greatly contributed to the inability to schedule appointments effectively and process billing accurately.

An increased number of missed appointments has been observed and is a worsening trend. Billing problems are attributed to missed appointments that go unrecorded, inaccurate patient information, inaccurate (or no) patient diagnoses, and ever-changing billing requirements imposed by medical insurance carriers.

A major problem exists when a patient’s testing expenses are covered by private health insurance, Medicare or Medicaid. A physician is supposed to provide at least one valid DSM III diagnosis at the time a request is made for a lab test. If the ordered test is not required for the DSM III diagnosis provided, then CWL will not be paid by the patient’s insurance company. Often times, physicians do not include diagnosis codes, as there is no incentive for them to do so. This has been a major data collection problem that cannot easily be controlled.

Currently, each patient service center is supported by their own independent system for scheduling appointments, either manual or automated to some degree.

### **Appointment Process (current)**

A patient will call to schedule an appointment, stating his or her laboratory appointment needs. Patients may request a specific phlebotomist. The appointment specialist will check the availability of the phlebotomist for specified date and time, and will book the appointment. Details of the appointment are confirmed with an appointment card that is mailed to the patient.

Four different events could occur following the original scheduling of the appointment:

1. The patient arrives at the appropriate service center at the scheduled appointment time and a specimen is collected for testing.
2. The patient cancels the appointment.
3. The appointment requirements change requiring a subsequent confirmation.
4. The patient is does not show up for the appointment

### **Envisioning Statement**

Cellular Won is in need of an appointment scheduling system where an appointment can be made at ***any*** patient service center. The system must capture the necessary patient, appointment, testing, and billing information at the time the appointment is scheduled.

Appointments can be made by placing a telephone call to a Patient Service Center, the Medical Laboratory office, or directly via a web-based interface. When the requested date and time cannot be satisfied, the new system will have the ability to offer an appointment with the requested phlebotomist and patient service centers at an alternate date and time.

Each patient service center has at least one appointment specialist and they are the only type of employee authorized to ‘book’ appointments for patients. The system should retain patient information, in addition to appointment and test information history.

While the system will not be required to process patient billing, the system must be capable of interfacing to the existing billing information system.

### Business Conceptual Model

Business Concept Model1

### **Conceptual Model Definitions**

**Appointment** – An Appointment is a block of time, specific to a calendar date that is reserved for a specimen draw or other laboratory service for a patient and a service provider.

**Medical Laboratory** – A Medical Laboratory is the central laboratory facility that governs licensing, performs laboratory testing, provides support services for employees, and is responsible for the administration of the business.

**Patient Service Center** – A Patient Service Center is a laboratory location where patient specimen samples are collected and prepared by a phlebotomist according to a laboratory requisition. Each Patient Service Center contains many examining rooms.

**Patient** – A Patient is a human being that has requested medical laboratory testing and/or received medical laboratory services. A patient may be of any age, ethnic origin, and may or may not be covered under a health insurance policy. A Patient must have a physician.

**Address** - An Address is a physical location where all patient correspondence will be delivered by mail.

**Appointment Specialist** – An Appointment Specialist is an employee of Cellular Won responsible for the scheduling of medical appointments for patients.

**Phlebotomist** - A Phlebotomist is an employee of Cellular Won and is trained to draw blood samples from patients.

**Laboratory Test** – A Laboratory Test is a pre-defined specification of analysis that is performed on a laboratory specimen for the purpose of providing medical information about the health of a patient. A Laboratory Test must be requested by a physician and is performed, or assessed, by a trained clinician or by automated test equipment. Laboratory Tests can have the following states: ‘ordered’, ‘tested’, ‘cancelled’, ‘reported’. All Laboratory Tests are performed at the Medical Laboratory and may have several testing parameters that are evaluated.

**DSM Diagnosis** – A DSM Diagnosis is a medical conclusion deemed to be caused by specific medical symptom(s) or condition(s) and registered in the DSMIII Diagnosis catalog.

**Health Insurance Carrier** – A Health Insurance Carrier is a company or governmental body that provides health care benefits for subscribing individuals.

**Invoice** – An Invoice is a financial statement documenting money due for laboratory testing services performed. An Invoice must contain patient identification information [name, address, social security number], test information [test name (s) and diagnosis code(s) for each test performed], insurance information [insurance carrier name, insurance coverage type name]

### Use Case

Context Diagram

Use Case Context

|  |
| --- |
| **Use Case Number:** 1 |
| **Use Case Name:** Set an Appointment |
| **Primary Actor:** Patient  **Secondary Actor:** Appointment Specialist |
| **Description:**  A patient schedules an appointment for a laboratory test ordered by an attending physician. |
| **Pre-Condition:**   1. The patient is registered with Cellular One, i.e., exists in the system. 2. The patient’s physician is valid and exists in the system. 3. The ordered lab test is valid and exists in the system. 4. The requested clinician (phlebotomist) is valid and exists in the system. |
| **Post-Condition:**   1. The appointment has been registered in the system. |
| **Normal Course of Action:**   1. An appointment request comes in [patient first & last name, date of birth, mailing address, tests ordered (by test number), desired phlebotomist, DSMIII diagnosis code, desired patient service center, requested appointment date and time]. 2. The System checks availability based upon appointment requirements. 3. The System creates a unique appointment number (not the data component). 4. The System commits the appointment [appointment number, date, time, phlebotomist, patient service center, patient id, test number]. 5. The System sends back the appointment number, date, time, phlebotomist, tests ordered, and total cost of testing, and requests confirmation.     **Extensions:**   1. The System displays “phlebotomist, and/or patient service center not available at that time” conflict message or other error message. |
| **Assumptions:**  The duration for each appointment is 15 minutes.  Appointments can be made from 8am to 5pm.  It takes a phlebotomist 30 minutes to get from one PSC to another and be ready for an appointment after the end of another appointment. The phlebotomist can be at any PSC at 8am, however, if their next appointment is at another PSC, they need 30 minutes from 8:15am to get to that next PSC. The phlebotomist will remain at the PSC of their appointment unless they are requested at another PSC for their next appointment (within 30 minutes). |

**Database Structure:**

Table Name: PATIENT  
  
Name Size Data Type   
==== ==== =========   
ID 5 VARCHAR   
NAME 75 VARCHAR   
ADDRESS 255 VARCHAR   
INSURANCE 1 CHAR   
DATEOFBIRTH 10 DATE   
PHYSICIAN 5 VARCHAR   
  
Primary Key: ID  
  
Foreign Key: Table[APPOINTMENT] Column[PATIENTID]  
  
\*\*\*\*\*\*\*\*\*\*\*\*\*  
  
Table Name: PHLEBOTOMIST  
  
Name Size Data Type   
==== ==== =========   
ID 5 VARCHAR   
NAME 75 VARCHAR   
  
Primary Key: ID  
  
Foreign Key: Table[APPOINTMENT] Column[PHLEBID]  
  
\*\*\*\*\*\*\*\*\*\*\*\*\*  
  
Table Name: DIAGNOSIS  
  
Name Size Data Type   
==== ==== =========   
CODE 10 VARCHAR   
NAME 255 VARCHAR   
  
Primary Key: CODE  
  
Foreign Key: Table[APPOINTMENTLABTEST] Column[DXCODE]  
  
\*\*\*\*\*\*\*\*\*\*\*\*\*  
  
Table Name: LABTEST  
  
Name Size Data Type   
==== ==== =========   
ID 5 VARCHAR   
NAME 255 VARCHAR   
COST 8 DECIMAL   
  
Primary Key: ID  
  
Foreign Key: Table[APPOINTMENTLABTEST] Column[LABTESTID]  
  
\*\*\*\*\*\*\*\*\*\*\*\*\*  
  
Table Name: PHYSICIAN  
  
Name Size Data Type   
==== ==== =========   
ID 5 VARCHAR   
NAME 75 VARCHAR   
  
Primary Key: ID  
  
Foreign Key: Table[PATIENT] Column[PHYSICIAN]  
  
\*\*\*\*\*\*\*\*\*\*\*\*\*  
  
Table Name: APPOINTMENTLABTEST  
  
Name Size Data Type   
==== ==== =========   
APPTID 5 VARCHAR   
LABTESTID 5 VARCHAR   
DXCODE 10 VARCHAR   
  
Primary Key: APPTID  
Primary Key: DXCODE  
Primary Key: LABTESTID  
  
  
\*\*\*\*\*\*\*\*\*\*\*\*\*  
  
Table Name: PSC  
  
Name Size Data Type   
==== ==== =========   
ID 5 VARCHAR   
NAME 75 VARCHAR   
  
Primary Key: ID  
  
Foreign Key: Table[APPOINTMENT] Column[PSCID]  
  
\*\*\*\*\*\*\*\*\*\*\*\*\*  
  
Table Name: APPOINTMENT  
  
Name Size Data Type   
==== ==== =========   
ID 5 VARCHAR   
PATIENTID 5 VARCHAR   
PHLEBID 5 VARCHAR   
PSCID 5 VARCHAR   
APPTDATE 10 DATE   
APPTTIME 8 TIME   
  
Primary Key: ID  
  
Foreign Key: Table[APPOINTMENTLABTEST] Column[APPTID]

LAMS SAMPLE DATA

LABORATORY APPOINTMENT MANAGEMENT SYSTEM

Patient Service Center

|  |  |
| --- | --- |
| PSC ID | PATIENT SERVICE CENTER NAME |
| 500 | North Hampton |
| 510 | Outer Banks |
| 520 | Down Town |
| 530 | Country Village |
| 540 | Wonder Isle |

Phlebotomist

|  |  |
| --- | --- |
| PLEB ID | PHLEBOTOMIST |
| 100 | Dorothea Dix |
| 110 | Elizabeth Corday |
| 120 | Mary Todd Lincoln |
| 130 | Mark Green |
| 140 | Florence Nightengale |

Lab Test

|  |  |  |
| --- | --- | --- |
| TEST ID | TEST NAME | COST |
| 82088 | Aldosterone, serum | $ 10.00 |
| 86900 | Blood Group & Rh Type, whole Blood | $ 15.00 |
| 82668 | Erythropoietin, Serum | $ 55.00 |
| 86609 | Streptococcus | $ 25.00 |
| 80200 | Drugs of Abuse Screen | $ 35.00 |

Diagnosis Code

|  |  |
| --- | --- |
| DX CODE | DIAGNOSIS NAME |
| 290.0 | Dementia, of the Alzheimer’s Type, With Late Onset, Uncomplicated |
| 292.9 | Caffeine – Related Disorder NOS |
| 291.1 | Alcohol Withdrawal Delierium |
| 307.3 | Stereotypic Disorder |
| 307.23 | Tourette’s Disorder |

Patient

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| PATIENT ID | PATIENT NAME | ADDRESS | INSURANCE | DATE OF BIRTH | PHYSICIAN |
| 210 | Tom Thumb | 31 Westbrook Drive | Y | 9/22/1959 | 10 |
| 220 | Alice Wonderland | 201 Mt. Hope Avenue | Y | 10/12/1985 | 20 |
| 230 | Sleeping Beauty | 445 Allentown Lane | N | 6/3/1990 | 30 |
| 240 | Johny Appleseed | 78 Jefferson Road | Y | 8/1/1995 | 40 |
| 250 | Jack Beanstalk | 90 Washington Avenue | N | 6/30/1950 | 50 |

Appointment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| APPT ID | PATIENT ID | PHLEB ID | PSC ID | DATE | TIME |
| 700 | 210 | 100 | 500 | 2/1/2017 | 1100:00 |
| 710 | 220 | 110 | 510 | 2/1/2017 | 1300:00 |
| 720 | 230 | 120 | 520 | 2/1/2017 | 1300:00 |
| 730 | 240 | 130 | 530 | 2/1/2017 | 1400:00 |
| 740 | 250 | 140 | 540 | 2/1/2017 | 1400:00 |
| 750 | 210 | 100 | 500 | 2/2/2017 | 1200:00 |
| 760 | 220 | 110 | 510 | 2/2/2017 | 1300:00 |
| 770 | 230 | 120 | 520 | 2/2/2017 | 1400:00 |
| 780 | 240 | 130 | 530 | 2/2/2017 | 1400:00 |
| 790 | 250 | 140 | 540 | 2/2/2017 | 1500:00 |

Physician

|  |  |
| --- | --- |
| PHYSICIAN ID | PHYSICIAN NAME |
| 10 | Dr. Howard |
| 20 | Dr. Fine |
| 30 | Dr. Brown |
| 40 | Dr. Mason |
| 50 | Dr. Smith |

Appointment Lab Test

|  |  |  |
| --- | --- | --- |
| APPT ID | LAB TEST | DIAGNOSIS CODE |
| 700 | 82088 | 290.0 |
| 710 | 86900 | 292.9 |
| 720 | 82668 | 291.1 |
| 730 | 86609 | 307.3 |
| 740 | 80200 | 307.23 |
| 750 | 80200 | 307.23 |
| 760 | 86609 | 307.3 |
| 770 | 82668 | 291.1 |
| 780 | 86900 | 292.9 |
| 790 | 82088 | 290.0 |

**Sample Returned Resources:**

**initialize() –** (this may take a while to run!)

java.lang.String : "**Database Initialized**"

**getAllAppointments()**

java.lang.String : "**<?xml version="1.0" encoding="UTF-8" standalone="no"?> <AppointmentList> <appointment date="2017-02-01" id="700" time="11:00:00"> <patient id="210"> <name>Tom Thumb</name> <address>31 Westbrook Drive</address> <insurance>Y</insurance> <dob>1959-09-22</dob> </patient> <phlebotomist id="100"> <name>Dorothea Dix</name> </phlebotomist> <psc id="500"> <name>North Hampton</name> </psc> <allLabTests> <appointmentLabTest appointmentId="700" dxcode="290.0" labTestId="82088"/> </allLabTests> </appointment> <appointment date="2017-02-01" id="710" time="13:00:00"> <patient id="220"> <name>Alice Wonderland</name> <address>201 Mt. Hope Avenue</address> <insurance>Y</insurance> <dob>1985-10-12</dob> </patient> <phlebotomist id="110"> <name>Elizabeth Corday</name> </phlebotomist> <psc id="510"> <name>Outer Banks</name> </psc> <allLabTests> <appointmentLabTest appointmentId="710" dxcode="292.9" labTestId="86900"/> </allLabTests> </appointment> <appointment date="2017-02-01" id="720" time="13:00:00"> <patient id="230"> <name>Sleeping Beauty</name> <address>445 Allentown Lane</address> <insurance>N</insurance> <dob>1990-06-03</dob> </patient> <phlebotomist id="120"> <name>Mary Todd Lincoln</name> </phlebotomist> <psc id="520"> <name>Down Town</name> </psc> <allLabTests> <appointmentLabTest appointmentId="720" dxcode="291.1" labTestId="82668"/> </allLabTests> </appointment> <appointment date="2017-02-01" id="730" time="14:00:00"> <patient id="240"> <name>Johny Appleseed</name> <address>78 Jefferson Road</address> <insurance>Y</insurance> <dob>1995-08-01</dob> </patient> <phlebotomist id="130"> <name>Mark Green</name> </phlebotomist> <psc id="530"> <name>Country Village</name> </psc> <allLabTests> <appointmentLabTest appointmentId="730" dxcode="307.3" labTestId="86609"/> </allLabTests> </appointment> <appointment date="2017-02-01" id="740" time="14:00:00"> <patient id="250"> <name>Jack Beanstalk</name> <address>90 Washington Avenue</address> <insurance>N</insurance> <dob>1950-06-30</dob> </patient> <phlebotomist id="140"> <name>Florence Nightengale</name> </phlebotomist> <psc id="540"> <name>Wonder Isle</name> </psc> <allLabTests> <appointmentLabTest appointmentId="740" dxcode="307.23" labTestId="80200"/> </allLabTests> </appointment> <appointment date="2017-02-02" id="750" time="12:00:00"> <patient id="210"> <name>Tom Thumb</name> <address>31 Westbrook Drive</address> <insurance>Y</insurance> <dob>1959-09-22</dob> </patient> <phlebotomist id="100"> <name>Dorothea Dix</name> </phlebotomist> <psc id="500"> <name>North Hampton</name> </psc> <allLabTests> <appointmentLabTest appointmentId="750" dxcode="307.23" labTestId="80200"/> </allLabTests> </appointment> <appointment date="2017-02-02" id="760" time="13:00:00"> <patient id="220"> <name>Alice Wonderland</name> <address>201 Mt. Hope Avenue</address> <insurance>Y</insurance> <dob>1985-10-12</dob> </patient> <phlebotomist id="110"> <name>Elizabeth Corday</name> </phlebotomist> <psc id="510"> <name>Outer Banks</name> </psc> <allLabTests> <appointmentLabTest appointmentId="760" dxcode="307.3" labTestId="86609"/> </allLabTests> </appointment> <appointment date="2017-02-02" id="770" time="14:00:00"> <patient id="230"> <name>Sleeping Beauty</name> <address>445 Allentown Lane</address> <insurance>N</insurance> <dob>1990-06-03</dob> </patient> <phlebotomist id="120"> <name>Mary Todd Lincoln</name> </phlebotomist> <psc id="520"> <name>Down Town</name> </psc> <allLabTests> <appointmentLabTest appointmentId="770" dxcode="291.1" labTestId="82668"/> </allLabTests> </appointment> <appointment date="2017-02-02" id="780" time="14:00:00"> <patient id="240"> <name>Johny Appleseed</name> <address>78 Jefferson Road</address> <insurance>Y</insurance> <dob>1995-08-01</dob> </patient> <phlebotomist id="130"> <name>Mark Green</name> </phlebotomist> <psc id="530"> <name>Country Village</name> </psc> <allLabTests> <appointmentLabTest appointmentId="780" dxcode="292.9" labTestId="86900"/> </allLabTests> </appointment> <appointment date="2017-02-02" id="790" time="15:00:00"> <patient id="250"> <name>Jack Beanstalk</name> <address>90 Washington Avenue</address> <insurance>N</insurance> <dob>1950-06-30</dob> </patient> <phlebotomist id="140"> <name>Florence Nightengale</name> </phlebotomist> <psc id="540"> <name>Wonder Isle</name> </psc> <allLabTests> <appointmentLabTest appointmentId="790" dxcode="290.0" labTestId="82088"/> </allLabTests> </appointment> </AppointmentList>** "

**addAppointment(String xml)**

**(to create a new appointment)**

**Sent:**

<?xml version="1.0" encoding="utf-8" standalone="no"?>

<appointment>

<date>2018-12-28</date>

<time>10:00</time>

<patientId>220</patientId>

<physicianId>20</physicianId>

<pscId>520</pscId>

<phlebotomistId>110</phlebotomistId>

<labTests>

<test id="86900" dxcode="292.9" />

<test id="86609" dxcode="307.3" />

</labTests>

</appointment>

**Note: if using SOAPUI to test, put: <![CDATA[ … ]]> around the xml above as the argument**

**Returned:**

java.lang.String : "**<?xml version="1.0" encoding="UTF-8" standalone="no"?> <AppointmentList> <appointment date="2018-12-28" id="791" time="10:00:00"> <patient id="220"> <name>Alice Wonderland</name> <address>201 Mt. Hope Avenue</address> <insurance>Y</insurance> <dob>1985-10-12</dob> </patient> <phlebotomist id="110"> <name>Elizabeth Corday</name> </phlebotomist> <psc id="520"> <name>Down Town</name> </psc> <allLabTests> <appointmentLabTest appointmentId="791" dxcode="307.3" labTestId="86609"/> <appointmentLabTest appointmentId="791" dxcode="292.9" labTestId="86900"/> </allLabTests> </appointment> </AppointmentList>** "

**addAppointment(String xml)**

**(Duplicate Appointment – sent same as above)**

**Returned:**

java.lang.String : "**<?xml version="1.0" encoding="UTF-8" standalone="no"?> <AppointmentList> <error>ERROR:Appointment is not available</error> </AppointmentList>** "

**addAppointment(String xml)**

**(Bad Appointment)**

**Sent:**

<?xml version="1.0" encoding="utf-8" standalone="no"?>

<appointment>

<date>2018-13-34</date>

<time>99:00</time>

<patientId>bad</patientId>

<physicianId>bad</physicianId>

<pscId>bad</pscId>

<phlebotomistId>bad</phlebotomistId>

<labTests>

<test id="bad" dxcode="000" />

</labTests>

</appointment>

**Note: if using SOAPUI to test, put: <![CDATA[ … ]]> around the xml above as the argument**

**Returned:**

java.lang.String : "**<?xml version="1.0" encoding="UTF-8" standalone="no"?> <AppointmentList> <error>ERROR:Appointment is not available</error> </AppointmentList>** "

**addAppointment(String xml)**

**(Too Close Appointment)**

**Sent:**

<?xml version="1.0" encoding="utf-8" standalone="no"?>

<appointment>

<date>2018-12-28</date>

<time>10:05</time>

<patientId>220</patientId>

<physicianId>20</physicianId>

<pscId>520</pscId>

<phlebotomistId>110</phlebotomistId>

<labTests>

<test id="86900" dxcode="292.9" />

<test id="86609" dxcode="307.3" />

</labTests>

</appointment>

**Note: if using SOAPUI to test, put: <![CDATA[ … ]]> around the xml above as the argument**

**Returned:**

java.lang.String : "**<?xml version="1.0" encoding="UTF-8" standalone="no"?> <AppointmentList> <error>ERROR:Appointment is not available</error> </AppointmentList>** "

**getAppointment(String appointmentID)**

**(this example is: 791 – the one added above)**

java.lang.String : "**<?xml version="1.0" encoding="UTF-8" standalone="no"?> <AppointmentList> <appointment date="2018-12-28" id="791" time="10:00:00"> <patient id="220"> <name>Alice Wonderland</name> <address>201 Mt. Hope Avenue</address> <insurance>Y</insurance> <dob>1985-10-12</dob> </patient> <phlebotomist id="110"> <name>Elizabeth Corday</name> </phlebotomist> <psc id="520"> <name>Down Town</name> </psc> <allLabTests> <appointmentLabTest appointmentId="791" dxcode="307.3" labTestId="86609"/> <appointmentLabTest appointmentId="791" dxcode="292.9" labTestId="86900"/> </allLabTests> </appointment> </AppointmentList>**