# Patient Appointment Application Project

Owner: Kyle Porter, Bao Dinh

Date: 06/05/17

# **Summary**

The company is creating an application that will allow patient appointments to be scheduled. The application will include the following database.

# **Expectations**

1. The application will store data in a SQL database.
2. The application must use views, stored procedures, and functions.
3. The application must be simple and keep costs at a minimum.
4. A working prototype should be available in a short period of time.

# Document History

Here is an account of changes to this document and any blocking issues.

## Change Log

|  |  |  |
| --- | --- | --- |
| Who | When | What |
| Kyle Porter | 05/26/17 | Added table names. |
| Kyle Porter | 05/29/17 | Finalize tables, constraints, and views. Start sprocs and functions |
| Kyle Porter | 05/31/17 | Finished Sprocs, fixed tables, constraints and views |
| Bao Dinh | 06/01/17 | Added Issues |

## Open Issues

|  |  |  |
| --- | --- | --- |
| Who | When | What |
| Bao | 05/26/17 | (1) Can a family (multiple patients) come in during one appointment? |
| Bao | 05/26/17 | (2) Updating/Deleting appointment should be restricted to appointments that have not occur yet correct? |
| Bao | 05/26/17 | (3) Do we need to create a database warehouse for OTAP? |
| Bao | 05/26/17 | (4) Can one user have many addresses? Or phone numbers? |
| Bao | 05/26/17 | (5) Do the clinics themselves have addresses? |
| Bao | 05/26/17 | (6) Do patients have a default physician that they see? |
| Bao Dinh | 06/01/17 | (7) Can phone numbers/emails be used for multiple users? |
| Bao Dinh | 06/01/17 | (8) Should Clinic names include location for uniqueness |
| Bao Dinh | 06/01/17 | (9)Should each clinic location have it’s own phone number even though it may be under a branch of a bigger healthcare facility? |

## Closed Issues

|  |  |  |
| --- | --- | --- |
| Who | When | What |
| Christie Gan | 05/26/17 | (1) Yes, multiple patients can come in for appointment, like a family |
| Christie Gan | 05/26/17 | (2) Correct, updating and deleting is restricted to appointments that have not occurred yet. |
| Christie Gan | 05/26/17 | (3) No, I don't believe you have to create a database warehouse, unless it is explicitly stated in the documentation. |
| Christie Gan | 05/26/17 | (4) For the sake of simplicity, let's just assume that a user does not have many addresses or phone numbers. Just assume that the user has only one of each. |
| Christie Gan | 05/26/17 | (5) Clinics have addresses. |
| Christie Gan | 05/26/17 | (6) You can choose whether or not patients have default  physician. |

# Solution Naming Conventions

## Database (OLTP)

|  |  |  |  |
| --- | --- | --- | --- |
| Object Type | Convention | Example | Description |
| Table | TableName | Products | A table used to hold data |
| View | vViewName | vProducts | A saved select statement that provides data |
| Stored Proc. | pProcedureName | pInsProducts | A set of saved statements for data transactions |
| Primary Key Constraint | pkObjectName | pkProducts | A constraint to enforce Primary Key functionality |
| Foreign Key Constraint | fkObjectNameToObjectName | pkProductsToCategories | A constraint to enforce Foreign Key functionality |
| Check Constraint | ckObjectNamePurpose | ckProductStandardPriceGreaterThanZero | A constraint to enforce Domain integrity |
| Unique Constraint | uObjectName | uProductName | A constraint to enforce Unique values |

# **OLTP Database Tables**

## Table Name: Patients

Description: Contains patient data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Notes |
| PatientID | int | 1 | PK, Identity (1,1) |
| PatientFirstName | nvarchar(50) | Bob | Not Null |
| PatientLastName | nvarchar(50) | Smith | Not Null |
| PatientPhoneNumber | nvarchar(20) | 253-241-3421 | Not Null |
| PatientEmail | nvarchar(50) | imail@email.com | Not Null |
| PatientAddress | nvarchar(50) | Times Square 25 | Not Null |
| PatientCity | nvarchar(50) | New York | Not Null |
| PatientState | char(2) | WA | Not Null |
| PatientZip | nvarchar(10) | 98303 | Not Null |

### Constraints

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| PatientID | Yes | No | Yes | No | Yes | Yes |
| PatientFirstName | No | No | Yes | No | No | No |
| PatientLastName | No | No | Yes | No | No | No |
| PatientPhoneNumber | No | No | Yes | No | No | No |
| PatientEmail | No | No | Yes | No | No | No |
| PatientAddress | No | No | Yes | No | No | No |
| PatientCity | No | No | Yes | No | No | No |
| PatientState | No | No | Yes | No | No | No |
| PatientZip | No | No | Yes | No | No | No |

## Table Name: Doctors

Description: Contains doctor data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Notes |
| DoctorID | int | 1 | PK, Identity (1,1) |
| DoctorFirstName | nvarchar(50) | Bob | Not Null |
| DoctorLastName | nvarchar(50) | Smith | Not Null |
| DoctorPhoneNumber | nvarchar(20) | 253-241-3421 | Not Null |
| DoctorEmail | nvarchar(50) | imail@email.com | Not Null |

### Constraints

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| DoctorID | Yes | No | Yes | No | Yes | Yes |
| DoctorFirstName | No | No | Yes | No | No | No |
| DoctorLastName | No | No | Yes | No | No | No |
| DoctorPhoneNumber | No | No | Yes | No | No | No |
| DoctorEmail | No | No | Yes | No | No | No |

## Table Name: Appointments

Description: Contains patient data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Notes |
| AppointmentID | int | 1 | PK, Identity (1,1) |
| PatientID | int | 2 | FK References dbo.Patients.PatientID |
| DoctorID | int | 3 | FK References dbo.Doctors.DoctorID |
| ClinicID | int | 4 | FK References dbo.Clinics.ClinicID |
| AppointmentDatetime | datetime | 1/13/2014 12:00:00 AM | Not Null, Check AppointmentDatetime > present |

### Constraints

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| AppointmentID | Yes | No | Yes | No | Yes | Yes |
| PatientID | No | Yes | Yes | No | Yes | No |
| DoctorID | No | Yes | Yes | No | Yes | No |
| AppointmentDatetime | No | No | Yes | Yes | No | No |

## Table Name: Clinics

Description: Contains clinic data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Notes |
| ClinicID | int | 1 | PK, Identity (1,1) |
| ClinicName | nvarchar(50) | Billy Joe Clinic | Unique |
| ClinicPhone | nvarchar(20) | 253-241-3421 | Unique |
| ClinicEmail | nvarchar(50) | imail@email.com | Unique |
| ClinicAddress | nvarchar(50) | Times Square 25 | Not Null |
| ClinicCity | nvarchar(50) | New York | Not Null |
| ClinicState | char(2) | WA | Not Null |
| ClinicZip | nvarchar(10) | 98303 | Not Null |

### Constraints

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| ClinicID | Yes | No | Yes | No | Yes | Yes |
| ClinicName | No | No | Yes | No | Yes | No |
| ClinicPhone | No | No | Yes | No | No | No |
| ClinicEmail | No | No | Yes | No | No | No |
| ClinicAddress | No | No | Yes | No | No | No |
| ClinicCity | No | No | Yes | No | No | No |
| ClinicState | No | No | Yes | No | No | No |
| ClinicZip | No | No | Yes | No | No | No |

## Table Name: PatientAppointments

Description: Contains patient and appointment data.

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Notes |
| PatientAppointmentID | int | 1 | PK, Identity (1,1) |
| PatientID | int | 2 | FK References dbo.Patients.PatientID |
| AppointmentID | int | 3 | FK References dbo.Appointments.AppointmentID |

### Constraints

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| PatientAppointmentID | Yes | No | Yes | No | Yes | Yes |
| PatientID | No | Yes | Yes | No | Yes | No |
| AppointmentID | No | Yes | Yes | No | Yes | No |

## Table Name: DoctorClinics

Description: Contains patient and appointment data.

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Notes |
| DoctorClinicID | int | 1 | PK, Identity (1,1) |
| DoctorID | int | 2 | FK References dbo.Doctors.DoctorID |
| ClinicID | int | 3 | FK References dbo.Clinics.ClinicID |

### Constraints

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| DoctorClinicID | Yes | No | Yes | No | Yes | Yes |
| DoctorID | No | Yes | Yes | No | Yes | No |
| ClinicID | No | Yes | Yes | No | Yes | No |

# **OLTP Database Views**

## View Name: vPatients

Description: Selects product data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| PatientID | Patients.PatientID | 1 | PK, Identity (1,1) |
| PatientFirstName | Patients.PatientFirstName | Bob | Not Null |
| PatientLastName | Patients.PatientLastName | Smith | Not Null |
| PatientPhoneNumber | Patients.PatientPhoneNumber | 253-241-3421 | Not Null |
| PatientEmail | Patients.PatientEmail | imail@email.com | Not Null |
| PatientAddress | Patients.PatientAddress | Times Square 25 | Not Null |
| PatientCity | Patients.PatientCity | New York | Not Null |
| PatientState | Patients.PatientState | WA | Not Null |
| PatientZip | Patients.PatientZip | 98303 | Not Null |

## View Name: vDoctors

Description: Selects product data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| DoctorID | Doctors.DoctorID | 1 | PK, Identity (1,1) |
| DoctorFirstName | Doctors.DoctorFirstName | Bob | Not Null |
| DoctorLastName | Doctors.DoctorLastName | Smith | Not Null |
| DoctorPhoneNumber | Doctors.DoctorPhoneNumber | 253-241-3421 | Not Null |
| DoctorEmail | Doctors.DoctorEmail | imail@email.com | Not Null |

## View Name: vAppointments

Description: Selects joined category and product data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| AppointmentID | Appointments.AppointmentID | 1 | PK, Identity (1,1) |
| PatientID | Patients.PatientID | 2 | FK |
| DoctorID | Doctors.DoctorID | 3 | FK |
| AppointmentDatetime | Appointments.AppointmentDateTime | 1/13/2014 12:00:00 AM | Not Null |

## View Name: vClinics

Description: Selects joined category and product data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| ClinicID | Clinics.ClinicID | 1 | PK, Identity (1,1) |
| ClinicName | Clinics.ClinicName | Billy Joe Clinic | Unique |
| ClinicPhone | Clinics.ClinicPhone | 253-241-3421 | Not Null |
| ClinicEmail | Clinics.ClinicEmail | imail@email.com | Not Null |
| ClinicAddress | Clinics.ClinicAddress | Times Square 25 | Not Null |
| ClinicCity | Clinics.ClinicCity | New York | Not Null |
| ClinicState | Clinics.ClinicState | WA | Not Null |
| ClinicZip | Clinics.ClinicZip | 98303 | Not Null |

## View Name: vPatientAppointments

Description: Selects joined category and product data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| PatientAppointmentID | PatientAppointments.PatientAppointmentID | 1 | PK, Identity (1,1) |
| PatientID | Patients.PatientID | 2 | FK |
| AppointmentID | Appointments.AppointmentID | 3 | FK |

## View Name: vDoctorClinics

Description: Selects joined category and product data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| DoctorClinicID | DoctorClinics.DoctorClinicID | 1 | PK, Identity (1,1) |
| DoctorID | Doctors.DoctorID | 2 | FK |
| ClinicID | Clinics.ClinicID | 3 | FK |

# **OLTP Database Stored Procedures**

## Stored Procedure Name: pInsPatient

Description: Insert Patient data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @PatientID | int | Output | 1 | Returns ID from @@Identity |
| @PatientFirstName | nvarchar(50) | Input | Bob |  |
| @PatientLastName | nvarchar(50) | Input | Smith |  |
| @PatientPhoneNumber | nvarchar(20) | Input | 253-241-3421 |  |
| @PatientEmail | nvarchar(50) | Input | imail@email.com |  |
| @PatientAddress | nvarchar(50) | Input | Times Square 25 |  |
| @PatientCity | nvarchar(50) | Input | New York |  |
| @PatientState | char(2) | Input | WA |  |
| @PatientZip | nvarchar(10) | Input | 98303 |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 100 | 100 = No error  -100 = Validation error |
| PatientID | Int | Output | 1 | Returns ID from @@Identity |

## Stored Procedure Name: pUpdPatient

Description: Update patient data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @PatientID | Int | Input | 1 |  |
| @PatientFirstName | nvarchar(50) | Input | Bob |  |
| @PatientLastName | nvarchar(50) | Input | Smith |  |
| @PatientPhoneNumber | nvarchar(20) | Input | 253-241-3421 |  |
| @PatientEmail | nvarchar(50) | Input | imail@email.com |  |
| @PatientAddress | nvarchar(50) | Input | Times Square 25 |  |
| @PatientCity | nvarchar(50) | Input | New York |  |
| @PatientState | char(2) | Input | WA |  |
| @PatientZip | nvarchar(10) | Input | 98303 |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 100 | 100 = No error  -100 = General error  -200 = Invalid PatientID |

## Stored Procedure Name: pDelPatient

Description: Delete patient data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @PatientID | int | Input | @PatID |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 100 | 100 = No error  -100 = General error  -200 = Invalid PatientID |

## Stored Procedure Name: pInsDoctor

Description: Insert Doctor Data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @DoctorID | int | Output | 1 | Returns ID from @@Identity |
| @DoctorFirstName | nvarchar(50) | Input | Bob |  |
| @DoctorLastName | nvarchar(50) | Input | Smith |  |
| @DoctorPhoneNumber | nvarchar(20) | Input | 253-241-3421 |  |
| @DoctorEmail | nvarchar(50) | Input | imail@email.com |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 100 | 100 = No error  -100 = Validation error |
| DoctorID | Int | Output | 1 | Returns ID from @@Identity |

## Stored Procedure Name: pUpdDoctor

Description: Updates Doctor data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @DoctorID | int | Input | 1 |  |
| @DoctorFirstName | nvarchar(50) | Input | Bob |  |
| @DoctorLastName | nvarchar(50) | Input | Smith |  |
| @DoctorPhoneNumber | nvarchar(20) | Input | 253-241-3421 |  |
| @DoctorEmail | nvarchar(50) | Input | imail@email.com |  |

### Results

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Type | Example | Notes |
| NA | Return Code | 100 | 100 = No error  -100 = General error  -200 = Invalid DoctorID |

## Stored Procedure Name: pDelDoctor

Description: Updates Doctor data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @DoctorID | int | Input | 1 |  |

### Results

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Type | Example | Notes |
| NA | Return Code | 100 | 100 = No error  -100 = General error  -200 = Invalid DoctorID |

## Stored Procedure Name: pInsAppointment

Description: Insert Doctor Data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @AppointmentID | int | Output | 1 | Returns ID from @@Identity |
| @PatientID | int | Input | 2 | fkAppointmentsToPatients |
| @DoctorID | int | Input | 3 | fkAppointmentsToDoctors |
| @AppointmentDatetime | datetime | Input | 1/13/2014 12:00:00 AM |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 100 | 100 = No error  -100 = Validation error |
| AppointmentID | Int | Output | 1 | Returns ID from @@Identity |

## Stored Procedure Name: pUpdAppointment

Description: Updates Doctor data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @AppointmentID | int | Input | 1 |  |
| @PatientID | int | Input | 2 |  |
| @DoctorID | int | Input | 3 |  |
| @AppointmentDatetime | datetime | Input | 1/13/2014 12:00:00 AM |  |

### Results

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Type | Example | Notes |
| NA | Return Code | 100 | 100 = No error  -100 = General error  -200 = Invalid AppointmentID |

## Stored Procedure Name: pDelAppointment

Description: Updates Doctor data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @AppointmentID | int | Input | 1 |  |

### Results

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Type | Example | Notes |
| NA | Return Code | 100 | 100 = No error  -100 = General error  -200 = Invalid AppointmentID |

## Stored Procedure Name: pInsClinic

Description: Insert Doctor Data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @ClinicID | int | Output | 1 | Returns ID from @@Identity |
| @ClinicName | nvarchar(50) | Input | Billy Joe Clinic |  |
| @ClinicPhone | nvarchar(20) | Input | 253-241-3421 |  |
| @ClinicEmail | nvarchar(50) | Input | imail@email.com |  |
| @ClinicAddress | nvarchar(50) | Input | Times Square 25 |  |
| @ClinicCity | nvarchar(50) | Input | New York |  |
| @ClinicState | char(2) | Input | WA |  |
| @ClinicZip | nvarchar(10) | Input | 98303 |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 100 | 100 = No error  -100 = Validation error |
| ClinicID | Int | Output | 1 | Returns ID from @@Identity |

## Stored Procedure Name: pUpdClinic

Description: Updates Doctor data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @ClinicID | int | Input | 1 |  |
| @ClinicName | nvarchar(50) | Input | Billy Joe Clinic |  |
| @ClinicPhone | nvarchar(20) | Input | 253-241-3421 |  |
| @ClinicEmail | nvarchar(50) | Input | imail@email.com |  |
| @ClinicAddress | nvarchar(50) | Input | Times Square 25 |  |
| @ClinicCity | nvarchar(50) | Input | New York |  |
| @ClinicState | char(2) | Input | WA |  |
| @ClinicZip | nvarchar(10) | Input | 98303 |  |

### Results

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Type | Example | Notes |
| NA | Return Code | 100 | 100 = No error  -100 = General error  -200 = Invalid ClinicID |

## Stored Procedure Name: pDelClinic

Description: Updates Doctor data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @ClincID | int | Input | 1 |  |

### Results

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Type | Example | Notes |
| NA | Return Code | 100 | 100 = No error  -100 = General error  -200 = Invalid ClinicID |