# Patient Appointment Application Project

Owner: Thomas Luk

Date: March 10, 2020

# **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 |
| Thomas Luk | Feb 28, 2020 | Created Codebase, Created Tables |
| Thomas Luk | Feb 29, 2020 | Created Views |
| Thomas Luk | March 1, 2020 | Created Stored Procedures |
| Thomas Luk | March 2, 2020 | Added Testing Code, Minor bugfixes |

## Open Issues

|  |  |  |
| --- | --- | --- |
| Who | When | What |
| NA | NA | NA |

## Closed Issues

|  |  |  |
| --- | --- | --- |
| Who | When | What |
| Thomas Luk | March 1 | Insert stored procedures did not output identities |
| Thomas Luk | March 2 | Testing code was causing verification errors with insert stored procedures |

# Solution Naming Conventions

## Database (OLTP)

|  |  |  |  |
| --- | --- | --- | --- |
| Object Type | Convention | Example | Description |
| Table | TableName | Patients | A table used to hold data |
| View | vViewName | vPatients | A saved select statement that provides data |
| Stored Proc. | pProcedureName | pInsPatients | A set of saved statements for data transactions |
| Primary Key Constraint | pkObjectName | pkPatients | A constraint to enforce Primary Key functionality |
| Foreign Key Constraint | fkObjectNameToObjectName | pkPatientsToAppointments | A constraint to enforce Foreign Key functionality |
| Check Constraint | ckObjectNamePurpose | ckPhoneNumberFormat | A constraint to enforce Domain integrity |
| Unique Constraint | uObjectName | uPatients | A constraint to enforce Unique values |

# **OLTP Database Tables**

## Table Name: Clinics

Description: Contains Clinic data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Notes |
| ClinicID | int | 1 | PK, Identity, |
| ClinicName | nVarchar(100) | Stehr-Reilly | Not Null,UK |
| ClinicPhoneNumber | nVarchar(100) | 415-436-6537 | Not Null, CK, Check to match Phone pattern 206-123-1234 |
| ClinicAddress | nVarchar(100) | 93225 Eliot Plaza | Not Null |
| ClinicCity | nVarchar(100) | San Francisco | Not Null |
| ClinicState | nchar(2) | CA | Not Null |
| ClinicZipCode | nVarchar(10) | 94947 | Not Null, CK  Check to match ZipCode pattern |

### Constraints

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| ClinicID | Yes | No | Yes | No | Yes | No |
| ClinicName | No | No | Yes | No | Yes | No |
| ClinicPhoneNumber | No | No | Yes | Yes | No | No |
| ClinicAddress | No | No | Yes | No | No | No |
| ClinicCity | No | No | Yes | No | No | No |
| ClinicState | No | No | Yes | No | No | No |
| ClinicZipCode | No | Yes | Yes | Yes | No | No |

## Table Name: Patients

Description: Contains Patient data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Notes |
| PatientID | int | 1 | PK, Identity |
| PatientFirstName | nVarchar(100) | Felicia | Not Null |
| PatientLastName | nVarchar(100) | Fydoe | Not Null |
| PatientPhoneNumber | nVarchar(100) | 212-501-1133 | Not Null,CK, Check to match Phone pattern 206-123-1234 |
| PatientAddress | nVarchar(100) | 24 Dryden Hill | Not Null |
| PatientCity | nVarchar(100) | Brooklyn | Not Null |
| PatientState | nchar(2) | NY | Not Null |
| PatientZipCode | nVarchar(10) | 11254 | Not Null,CK, Check to match ZipCode pattern |

### Constraints

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

## Table Name: Doctors

Description: Contains Patient data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Notes |
| DoctorID | int | 1 | PK, Identity |
| DoctorFirstName | nVarchar(100) | Jodi | Not Null |
| DoctorLastName | nVarchar(100) | Phippen | Not Null |
| DoctorPhoneNumber | nVarchar(100) | 936-201-0351 | Not Null,CK, Check to match Phone pattern 206-123-1234 |
| DoctorAddress | nVarchar(100) | 451 Clyde Gallagher Way | Not Null |
| DoctorCity | nVarchar(100) | Beaumont | Not Null |
| DoctorState | nchar(2) | TX | Not Null |
| DoctorZipCode | nVarchar(10) | 77705 | Not Null,CK, Check to match ZipCode pattern |

### Constraints

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| DoctorID | Yes | No | Yes | No | No | No |
| DoctorFirstName | No | No | Yes | No | No | No |
| DoctorLastName | No | No | Yes | No | No | No |
| DoctorPhoneNumber | No | No | Yes | Yes | No | No |
| DoctorAddress | No | No | Yes | No | No | No |
| DoctorCity | No | No | Yes | No | No | No |
| DoctorState | No | No | Yes | No | No | No |
| DoctorZipCode | No | No | Yes | Yes | No | No |

## Table Name: Appointments

Description: Contains Patient data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Notes |
| AppointmentID | int | 1 | PK, Identity |
| AppointmentDateTime | datetime | 2019-11-10 15:15:22 | Not Null |
| AppointmentPatientID | int | 5 | Not Null, FK References Patients |
| AppointmentDoctorID | int | 4 | Not Null, FK References Doctors |
| AppointmentClinicID | int | 2 | Not Null, FK References Clinics |

### Constraints

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| AppointmentID | Yes | No | Yes | No | Yes | No |
| AppointmentDateTime | No | No | Yes | No | No | No |
| AppointmentPatientID | No | Yes | Yes | No | No | No |
| AppointmentDoctorID | No | Yes | Yes | Yes | No | No |
| AppointmentClinicID | No | Yes | Yes | No | No | No |

# **OLTP Database Views**

## View Name: vClinics

Description: Selects clinic data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| ClinicID | Clinics.ClinicID | 1 |  |
| ClinicName | Clinics.ClinicName | Stehr-Reilly |  |
| ClinicPhoneNumber | Clinics.ClinicPhoneNumber | 415-436-6537 |  |
| ClinicAddress | Clinics.ClinicAddress | 93225 Eliot Plaza |  |
| ClinicCity | Clinics.ClinicCity | San Francisco |  |
| ClinicState | Clinics.ClinicState | CA |  |
| ClinicZipCode | Clinics.ClinicZipCode | 94947 |  |

## View Name: vPatients

Description: Selects Patient data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| PatientID | Patients.PatientID | 1 |  |
| PatientFirstName | Patients.PatientFirstName | Felicia |  |
| PatientLastName | Patients.PatientLastName | Fydoe |  |
| PatientPhoneNumber | Patients.PatientPhoneNumber | 212-501-1133 |  |
| PatientAddress | Patients.PatientAddress | 24 Dryden Hill |  |
| PatientCity | Patients.PatientCity | Brooklyn |  |
| PatientState | Patients.PatientState | NY |  |
| PatientZipCode | Patients.PatientZipCode | 11254 |  |

## View Name: vDoctors

Description: Selects Doctor data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| DoctorID | Doctors.DoctorID | 1 |  |
| DoctorFirstName | Doctors.DoctorFirstName | Jodi |  |
| DoctorLastName | Doctors.DoctorLastName | Phippen |  |
| DoctorPhoneNumber | Doctors.DoctorPhoneNumber | 936-201-0351 |  |
| DoctorAddress | Doctors.DoctorAddress | 451 Clyde Gallagher Way |  |
| DoctorCity | Doctors.DoctorCity | Beaumont |  |
| DoctorState | Doctors.DoctorState | TX |  |
| DoctorZipCode | Doctors.DoctorZipCode | 77705 |  |

## View Name: vAppointments

Description: Selects Appointment data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| AppointmentID | Appointments.AppointmentID | 1 |  |
| AppointmentDateTime | Appointments.AppointmentDateTime | 2019-11-10 15:15:22 |  |
| AppointmentPatientID | Appointments.AppointmentPatientID | 5 |  |
| AppointmentDoctorID | Appointments.AppointmentDoctorID | 4 |  |
| AppointmentClinicID | Appointments.AppointmentClinicID | 2 |  |

## View Name: vAppointmentsByPatientsDoctorsAndClinics

Description: Selects joined Patient, Doctor and Clinic data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| AppointmentID | Appointments.AppointmentID | 1 |  |
| AppointmentDate | Appointments.AppointmentDate | 2019-11-10 |  |
| AppointmentTime | Appointments.AppointmentTime | 15:15:22 |  |
| PatientID | Patients.PatientID | 1 |  |
| PatientName | Patients.PatientName | Felicia |  |
| PatientPhoneNumber | Patients.PatientPhoneNumber | Fydoe |  |
| PatientAddress | Patients.PatientAddress | 212-501-1133 |  |
| PatientCity | Patients.PatientCity | 24 Dryden Hill |  |
| PatientState | Patients.PatientState | Brooklyn |  |
| PatientZipCode | Patients.PatientZipCode | NY |  |
| DoctorID | Doctors.DoctorID | 1 |  |
| DoctorName | Doctors.DoctorName | Jodi Phippen |  |
| DoctorPhoneNumber | Doctors.DoctorPhoneNumber | 936-201-0351 |  |
| DoctorAddress | Doctors.DoctorAddress | 451 Clyde Gallagher Way |  |
| DoctorCity | Doctors.DoctorCity | Beaumont |  |
| DoctorState | Doctors.DoctorState | TX |  |
| DoctorZipCode | Doctors.DoctorZipCode | 77705 |  |
| ClinicID | Clinics.ClinicID | 1 |  |
| ClinicName | Clinics.ClinicName | Stehr-Reilly |  |
| ClinicPhoneNumber | Clinics.ClinicPhoneNumber | 415-436-6537 |  |
| ClinicAddress | Clinics.ClinicAddress | 93225 Eliot Plaza |  |
| ClinicCity | Clinics.ClinicCity | San Francisco |  |
| ClinicState | Clinics.ClinicState | CA |  |
| ClinicZipCode | Clinics.ClinicZipCode | 94947 |  |

# **OLTP Database Stored Procedures**

## Stored Procedure Name: pInsClinics

Description: Insert an entry into the Clinics table.

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @ClinicID | int | Output | 1 |  |
| @ClinicName | nVarchar(100) | Input | Stehr-Reilly |  |
| @ClinicPhoneNumber | nVarchar(100) | Input | 415-436-6537 |  |
| @ClinicAddress | nVarchar(100) | Input | 93225 Eliot Plaza |  |
| @ClinicCity | nVarchar(100) | Input | San Francisco |  |
| @ClinicState | nchar(2) | Input | CA |  |
| @ClinicZipCode | nVarchar(10) | Input | 94947 |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 1 | 1 = No error  -1 = Validation error |

## Stored Procedure Name: pUpdClinics

Description: Updates an entry in Clinics

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @ClinicID | int | Input | 1 |  |
| @ClinicName | nVarchar(100) | Input | Stehr-Reilly |  |
| @ClinicPhoneNumber | nVarchar(100) | Input | 415-436-6537 |  |
| @ClinicAddress | nVarchar(100) | Input | 93225 Eliot Plaza |  |
| @ClinicCity | nVarchar(100) | Input | San Francisco |  |
| @ClinicState | nchar(2) | Input | CA |  |
| @ClinicZipCode | nVarchar(10) | Input | 94947 |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 1 | 1 = No error  -1 = Validation error |

## Stored Procedure Name: pDelClinics

Description: Deletes an entry in Clinics

### Parameters

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

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 1 | 1 = No error  -1 = Error |

## Stored Procedure Name: pInsPatients

Description: Insert an entry into the Patients table.

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @PatientID | int | Output | 1 |  |
| @PatientFirstName | nVarchar(100) | Input | Felicia |  |
| @PatientLastName | nVarchar(100) | Input | Fydoe |  |
| @PatientPhoneNumber | nVarchar(100) | Input | 212-501-1133 |  |
| @PatientAddress | nVarchar(100) | Input | 24 Dryden Hill |  |
| @PatientCity | nVarchar(100) | Input | Brooklyn |  |
| @PatientState | nchar(2) | Input | NY |  |
| @PatientZipCode | nVarchar(10) | Input | 11254 |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 1 | 1 = No error  -1 = Validation error |

## Stored Procedure Name: pUpdPatients

Description: Updates an entry in the Patients table.

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @PatientID | int | Input | 1 |  |
| @PatientFirstName | nVarchar(100) | Input | Felicia |  |
| @PatientLastName | nVarchar(100) | Input | Fydoe |  |
| @PatientPhoneNumber | nVarchar(100) | Input | 212-501-1133 |  |
| @PatientAddress | nVarchar(100) | Input | 24 Dryden Hill |  |
| @PatientCity | nVarchar(100) | Input | Brooklyn |  |
| @PatientState | nchar(2) | Input | NY |  |
| @PatientZipCode | nVarchar(10) | Input | 11254 |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 1 | 1 = No error  -1 = Validation error |

## Stored Procedure Name: pDelPatients

Description: Deletes an entry in the Patients table.

### Parameters

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

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 1 | 1 = No error  -1 = Error |

## Stored Procedure Name: pInsDoctors

Description: Insert an entry into the Doctors table.

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @DoctorID | int | Output | 1 |  |
| @DoctorFirstName | nVarchar(100) | Input | Jodi |  |
| @DoctorLastName | nVarchar(100) | Input | Phippen |  |
| @DoctorPhoneNumber | nVarchar(100) | Input | 936-201-0351 |  |
| @DoctorAddress | nVarchar(100) | Input | 451 Clyde Gallagher Way |  |
| @DoctorCity | nVarchar(100) | Input | Beaumont |  |
| @DoctorState | nchar(2) | Input | TX |  |
| @DoctorZipCode | nVarchar(10) | Input | 77705 |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 1 | 1 = No error  -1 = Validation error |

## Stored Procedure Name: pUpdDoctors

Description: Updates an entry in the Doctors table.

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @DoctorID | int | Input | 1 |  |
| @DoctorFirstName | nVarchar(100) | Input | Jodi |  |
| @DoctorLastName | nVarchar(100) | Input | Phippen |  |
| @DoctorPhoneNumber | nVarchar(100) | Input | 936-201-0351 |  |
| @DoctorAddress | nVarchar(100) | Input | 451 Clyde Gallagher Way |  |
| @DoctorCity | nVarchar(100) | Input | Beaumont |  |
| @DoctorState | nchar(2) | Input | TX |  |
| @DoctorZipCode | nVarchar(10) | Input | 77705 |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 1 | 1 = No error  -1 = Validation error |

## Stored Procedure Name: pDelDoctors

Description: Deletes an entry in the Doctors table.

### Parameters

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

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 1 | 1 = No error  -1 = Error |

## Stored Procedure Name: pInsAppointments

Description: Insert an entry into the Appointments table.

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| AppointmentID | int | Output | 1 |  |
| AppointmentDateTime | datetime | Input | 2019-11-10 15:15:22 |  |
| AppointmentPatientID | int | Input | 5 |  |
| AppointmentDoctorID | int | Input | 4 |  |
| AppointmentClinicID | int | Input | 2 |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 1 | 1 = No error  -1 = Validation error |

## Stored Procedure Name: pUpdAppointments

Description: Updates an entry in the Appointments table.

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| AppointmentID | int | Input | 1 |  |
| AppointmentDateTime | datetime | Input | 2019-11-10 15:15:22 |  |
| AppointmentPatientID | int | Input | 5 |  |
| AppointmentDoctorID | int | Input | 4 |  |
| AppointmentClinicID | int | Input | 2 |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 1 | 1 = No error  -1 = Validation error |

## Stored Procedure Name: pDelAppointments

Description: Deletes an entry in the Appointments table.

### Parameters

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

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA | int | Return | 1 | 1 = No error  -1 = Error |