# Patient Appointment Application Project

Owner: Nicholas Fang

Date: March 15, 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 |
| NFang | 2020-02-25 | Created database design |
| NFang | 2020-03-04 | Created SQL script to set up tables, constraints, views, stored procedures, and permissions. |
| NFang | 2020-03-11 | Inserted data into the tables, create new reporting views. |

## Open Issues

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

## Closed Issues

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

# 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: Clinics

Description: Contains Clinic data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Notes |
| ClinicID | int | 1 | PK, Identity (1,1) |
| ClinicName | nVarchar(100) | Seattle Clinic | Unique |
| ClinicPhoneNumber | nVarchar(100) | 206-123-1233 |  |
| ClinicAddress | nVarchar(100) | 112 Seattle St. |  |
| ClinicCity | nVarchar(100) | Seattle |  |
| ClinicState | nchar(2) | WA |  |
| ClinicZipCode | nVarchar(10) | 98104 |  |

### 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 |
| 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 | No | Yes | Yes | No | No |

## Table Name: Patients

Description: Contains Patient data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Notes |
| PatientID | int | 1 | PK, Identity (1,1) |
| PatientFirstName | nVarchar(100) | Bob |  |
| PatientLastName | nVarchar(100) | Smith |  |
| PatientPhoneNumber | nVarchar(100) | 123-124-1232 |  |
| PatientAddress | nVarchar(100) | 223 Patient Ave. |  |
| PatientCity | nVarchar(100) | Seattle |  |
| PatientState | nchar(2) | WA |  |

### 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 | Yes | No | No |
| PatientPhoneNumber | No | No | Yes | No | No | No |
| PatientAddress | No | No | Yes | No | No | No |
| PatientCity | No | No | Yes | No | No | No |
| PatientState | No | No | Yes | Yes | 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(100) | John |  |
| DoctorLastName | nVarchar(100) | Doe |  |
| DoctorPhoneNumber | nVarchar(100) | 123-124-1232 |  |
| DoctorAddress | nVarchar(100) | 223 Doctor Ave. |  |
| DoctorCity | nVarchar(100) | Seattle |  |
| DoctorState | nchar(2) | WA |  |

### 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 | Yes | No | No |
| DoctorPhoneNumber | No | No | Yes | No | No | No |
| DoctorAddress | No | No | Yes | No | No | No |
| DoctorCity | No | No | Yes | No | No | No |
| DoctorState | No | No | Yes | Yes | No | No |

## Table Name: Appointments

Description: Contains Appointment data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Example | Notes |
| AppointmentID | int | 1 | PK, Identity (1,1) |
| AppointmentDateTime | datetime | 2019-07-18 11:23:25 |  |
| AppointmentPatientID | int | 1 | FK |
| AppointmentDoctorID | int | 1 | FK |
| AppointmentClinicID | int | 1 | FK |

### Constraints

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Column Name | Primary Key | Foreign Key | Not Null | Check | Unique | Default |
| AppointmentID | Yes | No | Yes | No | Yes | Yes |
| AppointmentDateTime | No | No | Yes | No | No | No |
| AppointmentPatientID | No | Yes | Yes | No | No | No |
| AppointmentDoctorID | No | Yes | Yes | No | 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 | Seattle Clinic |  |
| ClinicPhoneNumber | Clinics.ClinicPhoneNumber | 206-123-1233 |  |
| ClinicAddress | Clinics.ClinicAddress | 112 Seattle St. |  |
| ClinicCity | Clinics.ClinicCity | Seattle |  |
| ClinicState | Clinics.ClinicState | WA |  |
| ClinicZipCode | Clinics.ClinicZipCode | 98104 |  |

## View Name: vPatients

Description: Selects Patient data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| PatientID | Patients.PatientID | 1 |  |
| PatientFirstName | Patients.PatientFirstName | Bob |  |
| PatientLastName | Patients.PatientLastName | Smith |  |
| PatientPhoneNumber | Patients.PatientPhoneNumber | 123-124-1232 |  |
| PatientAddress | Patients.PatientAddress | 223 Patient Ave. |  |
| PatientCity | Patients.PatientCity | Seattle |  |
| PatientState | Patients.PatientState | WA |  |

## View Name: vDoctors

Description: Selects Doctor data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| DoctorID | Doctors.DoctorID | 1 |  |
| DoctorFirstName | Doctors.DoctorFirstName | John |  |
| DoctorLastName | Doctors.DoctorLastName | Doe |  |
| DoctorPhoneNumber | Doctors.DoctorPhoneNumber | 123-124-1232 |  |
| DoctorAddress | Doctors.DoctorAddress | 223 Doctor Ave. |  |
| DoctorCity | Doctors.DoctorCity | Seattle |  |
| DoctorState | Doctors.DoctorState | WA |  |

## View Name: vAppointments

Description: Selects Appointment data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| AppointmentID | Appointments.AppointmentID | 1 |  |
| AppointmentDateTime | Appointments.AppointmentDateTime | 2019-07-18 11:23:25 |  |
| AppointmentPatientID | Appointments.AppointmentPatientID | 1 |  |
| AppointmentDoctorID | Appointments.AppointmentDoctorID | 1 |  |
| AppointmentClinicID | Appointments.AppointmentClinicID | 1 |  |

## View Name: vAppointmentsByPatientsDoctorsAndClinics

Description: Selects joined Appointments, Patients, Doctors and Clinics data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| AppointmentID | Appointments.AppointmentID | 1 | Join Column |
| AppointmentDate | Appointments.AppointmentDateTime | 2/11/2020 |  |
| AppointmentTime | Appointments.AppointmentDateTime | 11:34 |  |
| PatientID | Patients.PatientID | 1 | Join Column |
| PatientName | concat(Patients.PatientFirstName, ‘ ‘, Patients.PatientFirstName) | Bob Smith |  |
| PatientPhoneNumber | Patients.PatientPhoneNumber | 123-231-1123 |  |
| PatientAddress | Patients.PatientAddress | 123 Seattle Ave |  |
| PatientCity | Patients.PatientCity | Seattle |  |
| PatientState | Patients.PatientState | WA |  |
| PatientZipCode | Patients.PatientZipCode | 23412 |  |
| DoctorID | Doctors.DoctorID | 1 | Join Column |
| DoctorName | concat(Doctors.DoctorFirstName, ‘ ‘, Doctors.DoctorLastName) | John Doe |  |
| DoctorPhoneNumber | Doctors.DoctorPhoneNumber | Doe |  |
| DoctorAddress | Doctors.DoctorAddress | 1256 Doctor Ave |  |
| DoctorCity | Doctors.DoctorCity | Seattle |  |
| DoctorState | Doctors.DoctorState | WA |  |
| DoctorZipCode | Doctors.DoctorZipCode | 99205 |  |
| ClinicID | Clinics.ClinicID | 1 | Join Column |
| ClinicName | Clinics.ClinicName | Seattle Clinic |  |
| ClinicPhoneNumber | Clinics.ClinicPhoneNumber | 153-234-1242 |  |
| ClinicAddress | Clinics.ClinicAddress | 934 E. Seattle Dr. |  |
| ClinicCity | Clinics.ClinicCity | Seattle |  |
| ClinicState | Clinics.ClinicState | WA |  |
| ClinicZipCode | Clinics.ClinicZipCode | 98102 |  |

## View Name: vAppointmentsByPatientsDoctorsAndClinicsDetails

Description: Selects joined Appointments, Patients, Doctors and Clinics data for a quick overview of details.

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| AppointmentID | Appointments.AppointmentID | 1 | Join Column |
| AppointmentDate | Appointments.AppointmentDate | 2/11/2020 |  |
| AppointmentTime | Appointments.AppointmentTime | 11:34 |  |
| PatientName | concat(Patients.PatientFirstName, ‘ ‘, Patients.PatientLastName) | Bob Smith |  |
| DoctorID | Doctors.DoctorID | 1 | Join Column |
| DoctorName | concat(Doctors.DoctorFirstName, ‘ ‘, Doctors.DoctorLastName) | John Doe |  |
| ClinicID | Clinics.ClinicID | 1 | Join Column |
| ClinicName | Clinics.ClinicName | Seattle Clinic |  |

## View Name: vPatientsByDoctor

Description: Selects joined Patients, and Doctors data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| AppointmentID | Appointments.AppointmentID | 1 | Join Column |
| PatientID | Patients.PatientID | 1 | Join Column |
| PatientName | concat(Patients.PatientFirstName, ‘ ‘, Patients.PatientLastName) | John Doe |  |
| DoctorID | Doctors.DoctorID | 1 | Join Column |
| DoctorName | Clinics.ClinicName | Bob Smith |  |

## View Name: vClincsByPatientsCount

Description: Selects joined Appointments, Patients, and Clinics data

### Columns

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Source | Example | Notes |
| AppointmentID | Appointments.AppointmentID | 1 | Join Column |
| PatientCount | count(Patients.PatientID) | 10 | Join Column  Counts the number of entries |
| ClinicID | Clinics.ClinicID | 1 | Join Column |
| ClinicName | Clinics.ClinicName | Seattle Clinic |  |

# **OLTP Database Stored Procedures**

## Stored Procedure Name: pInsClinics

Description: Inserts Clinic data

Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @ClinicID | int | Output | @ClinicID | Returns Inserted ID using @@Identity |
| @ClinicName | nvarchar(100) | Input | Seattle Clinic |  |
| @ClinicPhoneNumber | nvarchar(100) | Input | 123-123-1234 |  |
| @ClinicAddress | nvarchar(100) | Input | 343 Seale Dr. |  |
| @ClinicCity | nvarchar(100) | Input | Seattle |  |
| @ClinicState | nchar(2) | Input | WA |  |
| @ClinicZipCode | nvarchar(100) | Input | 98104 |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA |  | Return | 1 | 1 = No error  -1 = General error |
| @ClinicID | int | Output | 1 | Returns Inserted ID using @@Identity |

## Stored Procedure Name: pUpdClinics

Description: Updates Clinic data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @ClinicID | int | Input | @ClinicID |  |
| @ClinicName | nvarchar(100) | Input | Seattle Clinic |  |
| @ClinicPhoneNumber | nvarchar(100) | Input | 123-123-1234 |  |
| @ClinicAddress | nvarchar(100) | Input | 343 Seale Dr. |  |
| @ClinicCity | nvarchar(100) | Input | Seattle |  |
| @ClinicState | nchar(2) | Input | WA |  |
| @ClinicZipCode | nvarchar(100) | Input | 98104 |  |

### Results

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

## Stored Procedure Name: pDelClinics

Description: Updates Clinic data

### Parameters

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

### Results

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Type | Example | Notes |
| NA | Return Code | 1 | 1 = No error  -1 = General error |

## Stored Procedure Name: pInsPatients

Description: Inserts Patient data

Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @PatientID | int | Output | @PatientID | Returns Inserted ID using @@Identity |
| @PatientFirstName | nvarchar(100) | Input | John |  |
| @PatientLastName | nvarchar(100) | Input | Smith |  |
| @PatientPhoneNumber | nvarchar(100) | Input | 123-123-1234 |  |
| @PatientAddress | nvarchar(100) | Input | 343 Seale Dr. |  |
| @PatientCity | nvarchar(100) | Input | Seattle |  |
| @PatientState | nchar(2) | Input | WA |  |
| @PatientZipCode | nvarchar(100) | Input | 98104 |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA |  | Return | 1 | 1 = No error  -1 = General error |
| @PatientID | int | Output | 1 | Returns Inserted ID using @@Identity |

## Stored Procedure Name: pUpdPatients

Description: Updates Patient data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @PatientID | int | Input | @PatientID |  |
| @PatientFirstName | nvarchar(100) | Input | John |  |
| @PatientLastName | nvarchar(100) | Input | Smith |  |
| @PatientPhoneNumber | nvarchar(100) | Input | 123-123-1234 |  |
| @PatientAddress | nvarchar(100) | Input | 343 Seale Dr. |  |
| @PatientCity | nvarchar(100) | Input | Seattle |  |
| @PatientState | nchar(2) | Input | WA |  |
| @PatientZipCode | nvarchar(100) | Input | 98104 |  |

### Results

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

## Stored Procedure Name: pDelPatients

Description: Updates Patient data

### Parameters

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

### Results

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Type | Example | Notes |
| NA | Return Code | 1 | 1 = No error  -1 = General error |

## Stored Procedure Name: pInsDoctors

Description: Inserts Doctor data

Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @DoctorID | int | Output | @DocyorID | Returns Inserted ID using @@Identity |
| @DoctorFirstName | nvarchar(100) | Input | John |  |
| @DoctorLastName | nvarchar(100) | Input | Smith |  |
| @DoctorPhoneNumber | nvarchar(100) | Input | 123-123-1234 |  |
| @DoctorAddress | nvarchar(100) | Input | 343 Seale Dr. |  |
| @DoctorCity | nvarchar(100) | Input | Seattle |  |
| @DoctorState | nchar(2) | Input | WA |  |
| @DoctorZipCode | nvarchar(100) | Input | 98104 |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA |  | Return | 1 | 1 = No error  -1 = General error |
| @DoctorID | int | Output | 1 | Returns Inserted ID using @@Identity |

## Stored Procedure Name: pUpdDoctors

Description: Updates Doctor data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @DoctorID | int | Input | @DoctorID |  |
| @DoctorFirstName | nvarchar(100) | Input | John |  |
| @DoctorLastName | nvarchar(100) | Input | Smith |  |
| @DoctorPhoneNumber | nvarchar(100) | Input | 123-123-1234 |  |
| @DoctorAddress | nvarchar(100) | Input | 343 Seale Dr. |  |
| @DoctorCity | nvarchar(100) | Input | Seattle |  |
| @DoctorState | nchar(2) | Input | WA |  |
| @DoctorZipCode | nvarchar(100) | Input | 98104 |  |

### Results

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

## Stored Procedure Name: pDelDoctors

Description: Updates Doctor data

### Parameters

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

### Results

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Type | Example | Notes |
| NA | Return Code | 1 | 1 = No error  -1 = General error |

## Stored Procedure Name: pInsAppointments

Description: Inserts Appointment data

Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @AppointmentID | int | Output | @AppointmentID | Returns Inserted ID using @@Identity |
| @AppointmentDateTime | datetime | Input | 2020-03-23 |  |
| @AppointmentPatientID | int | Input | 1 |  |
| @AppointmentDoctorID | int | Input | 1 |  |
| @AppointmentDoctorID | int | Input | 1 |  |

### Results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column Name | Data Type | Type | Example | Notes |
| NA |  | Return | 1 | 1 = No error  -1 = General error |
| @AppointmentID | int | Output | 1 | Returns Inserted ID using @@Identity |

## Stored Procedure Name: pUpdAppointments

Description: Updates Appointment data

### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter Name | Data Type | Type | Example | Notes |
| @AppointmentID | int | Input | @AppointmentID |  |
| @AppointmentDateTime | datetime | Input | 2020-03-23 |  |
| @AppointmentPatientID | int | Input | 1 |  |
| @AppointmentDoctorID | int | Input | 1 |  |
| @AppointmentDoctorID | int | Input | 1 |  |

### Results

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

## Stored Procedure Name: pDelAppointments

Description: Updates Appointment data

### Parameters

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

### Results

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Type | Example | Notes |
| NA | Return Code | 1 | 1 = No error  -1 = General error |