Research Document (MySQL Spatial Data Types, Storing spatial data and using it to create a Restful Web service)

Aim: The aim of the document is to successfully research ways to be able to store geo spatial dats in MySQL database

Why: Currently (24 Feb, 2017) I have been using SAP Hana HCP but the issue is its not free and is very expensive to move from trail to pro version, so the better alternative is MySQL if I am successfully able to implement what I was able to do with HCP. And, the advantages will be free of cost, HCP trail needs restart every 12 hours and auto deletes after 6 days which is a big disadvantage, MySQL will allow 99% uptime for web service.

****

Importance of the external resources used based on Level:

Level (High) – Very helpful and important
Level (Medium) – Important and Some what helpful and related
Level (Low) – Helped to see some light, but not very useful resource.

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**********Creating a table with geometry**********

create table myspatialdata (id integer(7), bpolygon Geometry, mpoint Geometry);

****

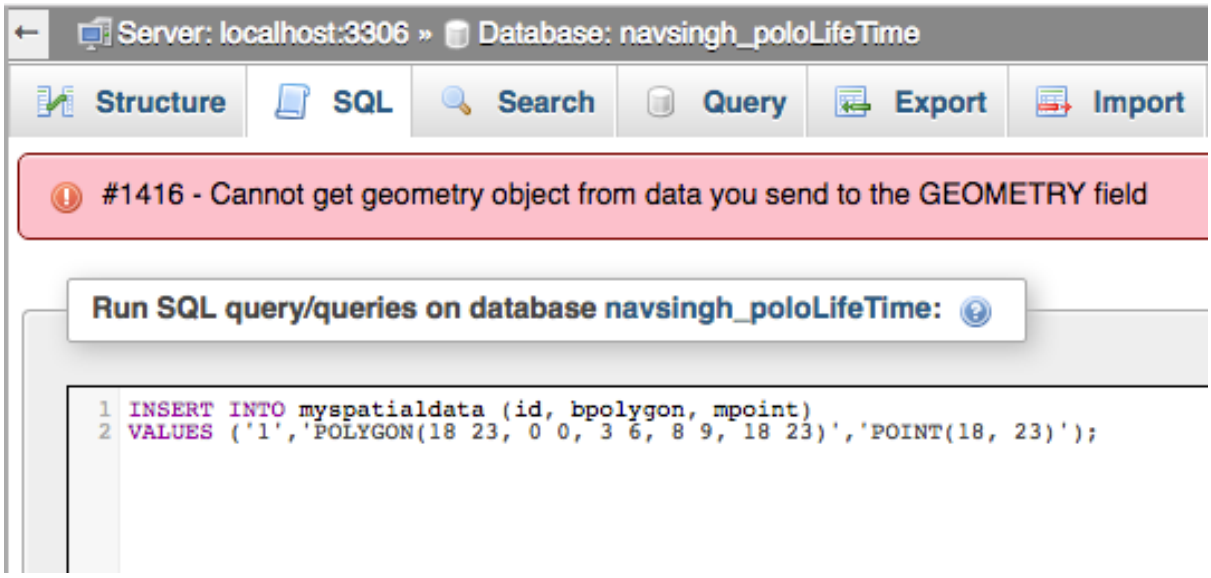
Query to show the columns in the table:

```
SHOW COLUMNS FROM myspatialdata
```

Field	Type	Null	Key	Default	Extra
id	int(7)	YES		*NULL*	
bpolygon	geometry	YES		*NULL*	
mpoint	geometry	YES		*NULL*	

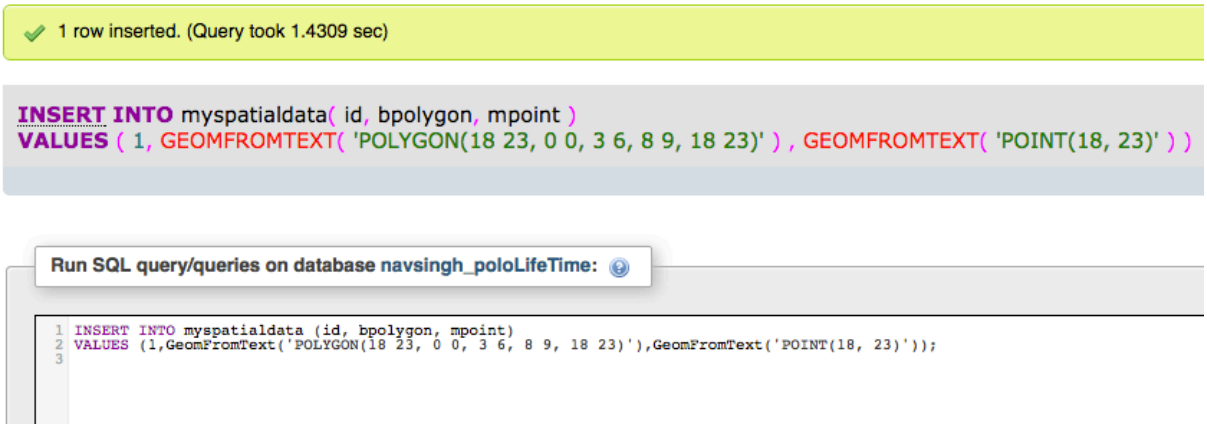
Quite close to solving problem of inserting spatial data into MySQL*

INSERT INTO myspatialdata (id, bpolygon, mpoint)
VALUES ('1','POLYGON(18 23, 0 0, 3 6, 8 9, 18 23)','POINT(18, 23)');

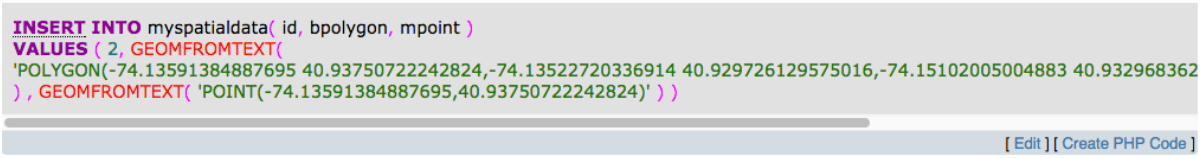


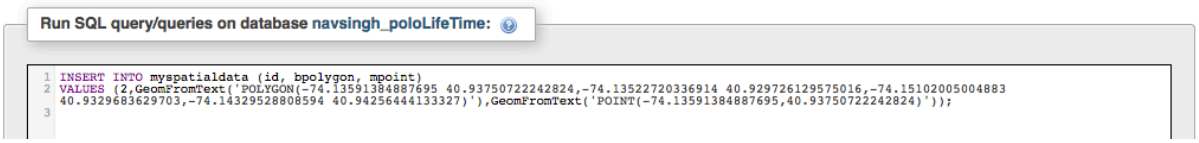
****Working SQL Statement to insert spatial data in MySQL (Polygon and Point)******

INSERT INTO myspatialdata (id, bpolygon, mpoint)
VALUES (1,GeomFromText('POLYGON(18 23, 0 0, 3 6, 8 9, 18 23)'),GeomFromText('POINT(18, 23)'));



INSERT INTO myspatialdata (id, bpolygon, mpoint)
VALUES (2,GeomFromText('POLYGON(-74.13591384887695 40.93750722242824,-74.13522720336914 40.929726129575016,-74.15102005004883 40.9329683629703,-74.14329528808594 40.94256444133327)'),GeomFromText('POINT(-74.13591384887695,40.93750722242824)'));





Note: Useful documentation on MySQL Spatial Data Types
http://www.w3resource.com/mysql/mysql-spatial-data-types.php
(Level: High)

Inserting Coordinates into MySQL (Stack Flow)
http://stackoverflow.com/questions/15453084/inserting-coordinates-into-mysql-polyfromtext-sql-syntax-error-returning-nul
(Level: Low)

******The end of the Inserting Spatial data like Polygon and Point in to database table*****

****
RESEARCH RESULTS: FAILED
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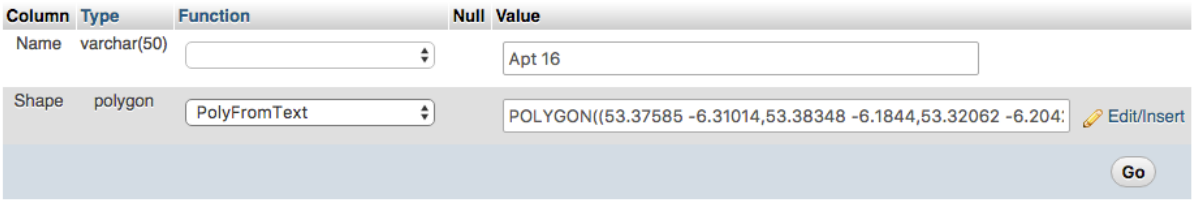
Inserting Geo-spatial Polygon into the MySQL Database

INSERT INTO `Buildings` (`Name`, `Shape`) VALUES ('Apt 15',
PolyFromText('POLYGON((50.866753 5.686455, 50.859819 5.708942, 50.851475 5.722675, 50.841611 5.720615, 50.834023 5.708427, 50.840744 5.689373, 50.858735 5.673923, 50.866753 5.686455))'));

Reference: https://gis.stackexchange.com/questions/23900/how-to-add-polygon-in-mysql-database



RESEARCH RESULTS: PASSED (Working)

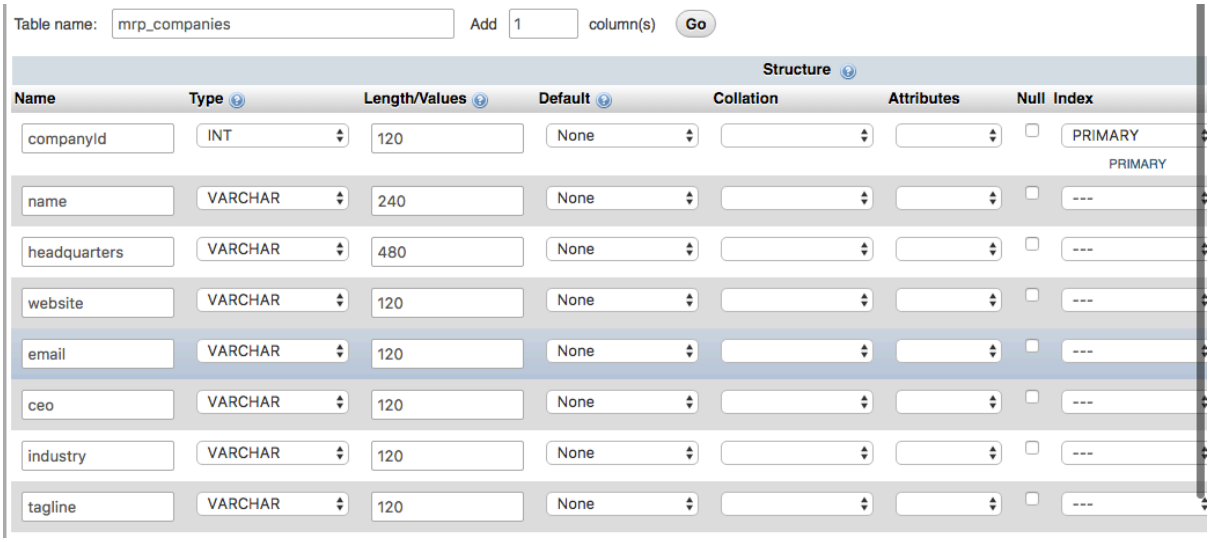
1 Resources for Functioanal Requirements

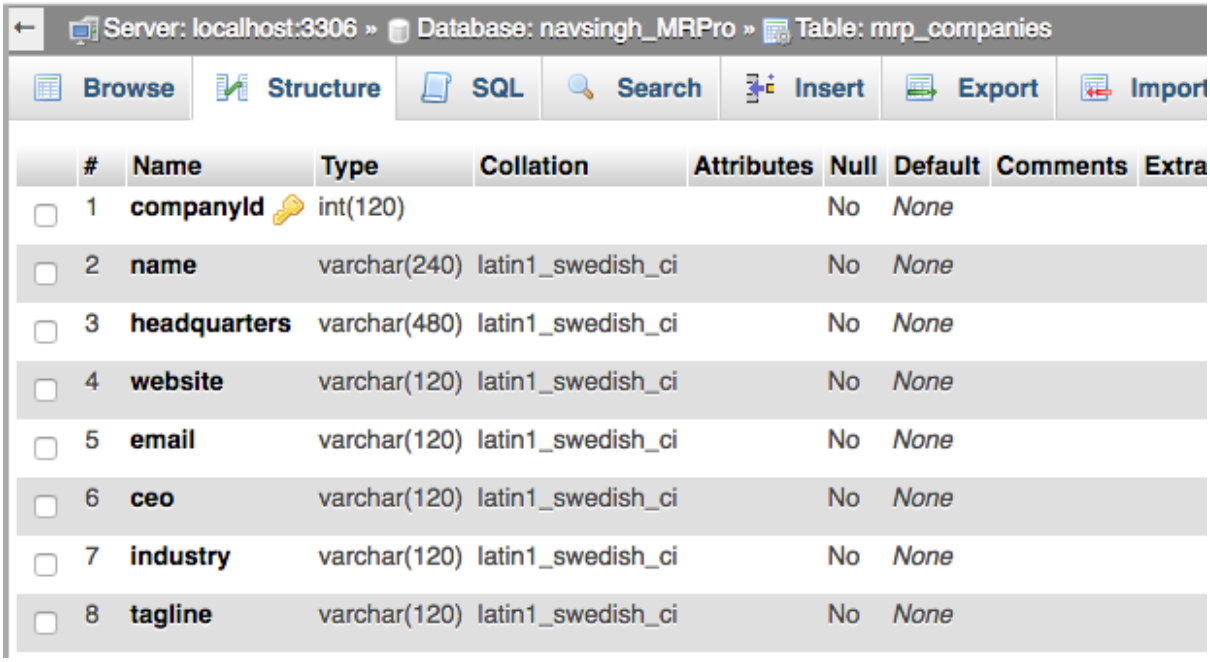
Requirement 7:
Requirement 8: Photo Upload
Image upload example with Swift and PHP - http://swiftdeveloperblog.com/image-upload-example/
Requirement 9:

2 Final Report Database

1- Companies Table (mrp_companies) to store all the information regarding the different companies this will allow us to –

1- Use app for multiple companies/organisations/instituations by storing data for different companies and use it in a single app (example- city council can buy the app to list the different public properties/companies and the available buildings/meeting rooms in them)
2- or just use the app for one company (example – Our college – for NCI use only can be deployed as an internal app)



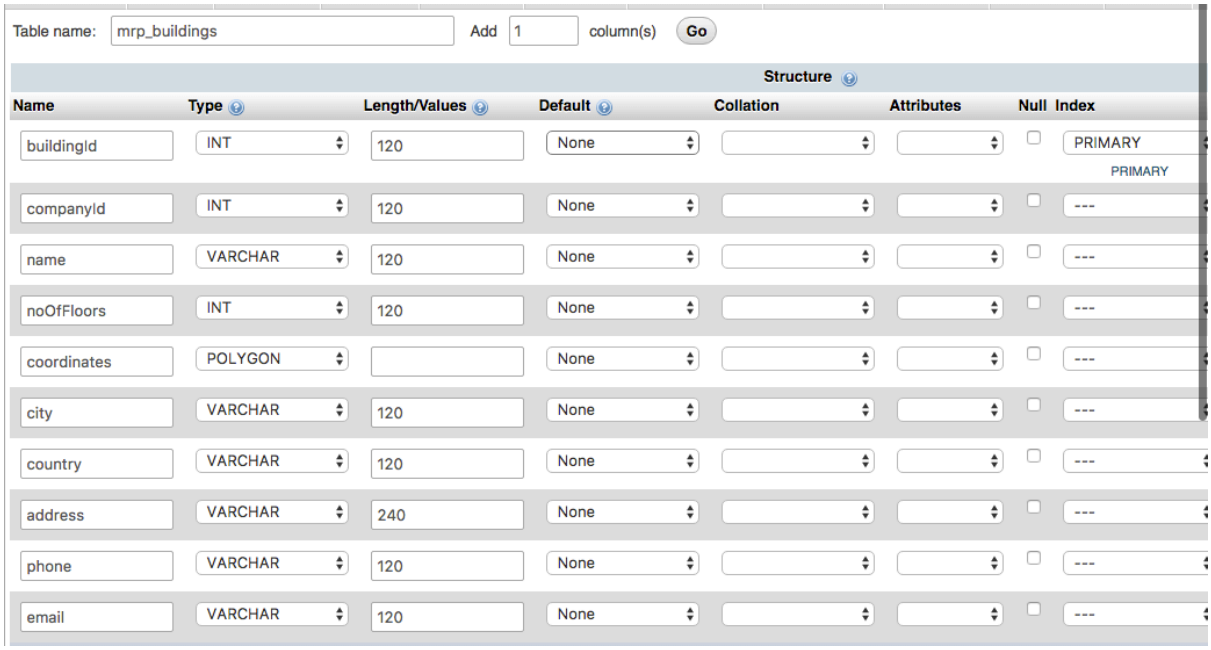


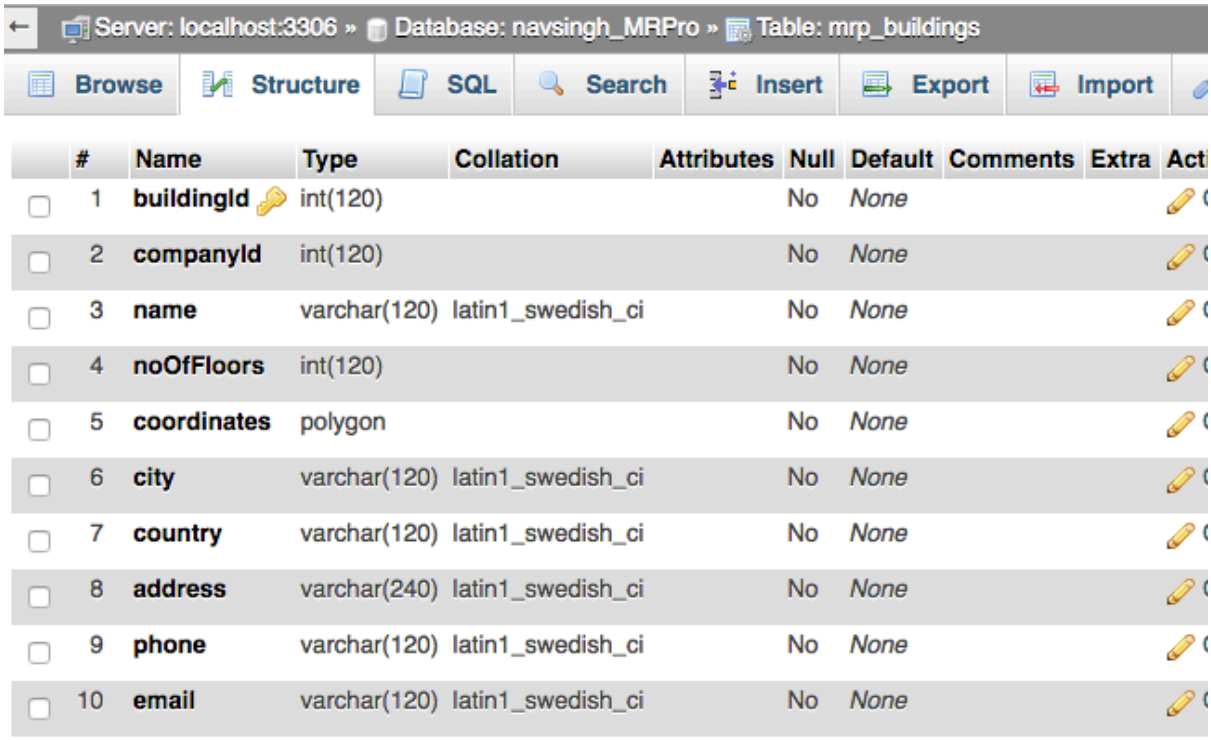
#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	companyId	int(120)			No	*None*		
2	name	varchar(240)	latin1_swedish_ci		No	*None*		
3	headquarters	varchar(480)	latin1_swedish_ci		No	*None*		
4	website	varchar(120)	latin1_swedish_ci		No	*None*		
5	email	varchar(120)	latin1_swedish_ci		No	*None*		
6	ceo	varchar(120)	latin1_swedish_ci		No	*None*		
7	industry	varchar(120)	latin1_swedish_ci		No	*None*		
8	tagline	varchar(120)	latin1_swedish_ci		No	*None*		

```
CREATE TABLE `navsingh_MRPro`.`mrp_companies` ( `companyId` INT(120) NOTNULL , `name` VARCHAR
(240) NOT NULL , `headquarters` VARCHAR(480) NOTNULL , `website` VARCHAR(120) NOT NULL , `ema
il` VARCHAR(120) NOT NULL ,`ceo` VARCHAR(120) NOT NULL , `industry` VARCHAR(120) NOT NULL ,`t
agline` VARCHAR(120) NOT NULL , PRIMARY KEY (`companyId`)) ENGINE =MyISAM;
```

```
CREATE TABLE `navsingh_MRPro`.`mrp_companies` (
  `companyId` INT(120) NOT NULL ,
  `name` VARCHAR(240) NOT NULL ,
  `headquarters` VARCHAR(480) NOT NULL ,
  `website` VARCHAR(120) NOT NULL ,
  `email` VARCHAR(120) NOT NULL ,
  `ceo` VARCHAR(120) NOT NULL ,
  `industry` VARCHAR(120) NOT NULL ,
  `tagline` VARCHAR(120) NOT NULL , PRIMARY KEY (`companyId`)) ENGINE = MyISAM;
```

2 - Buildings table (mrp_buildings) to store all the information regarding buildings and also their co-ordinates (using geospatial features of MySQL – here we are using Polygon/Geometry)

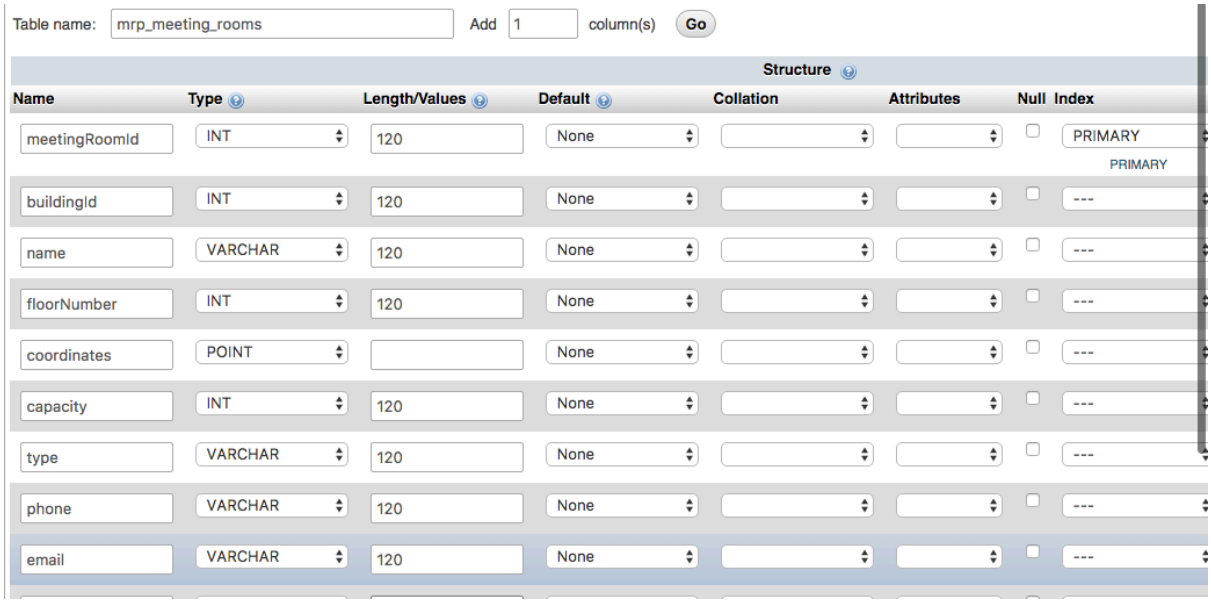


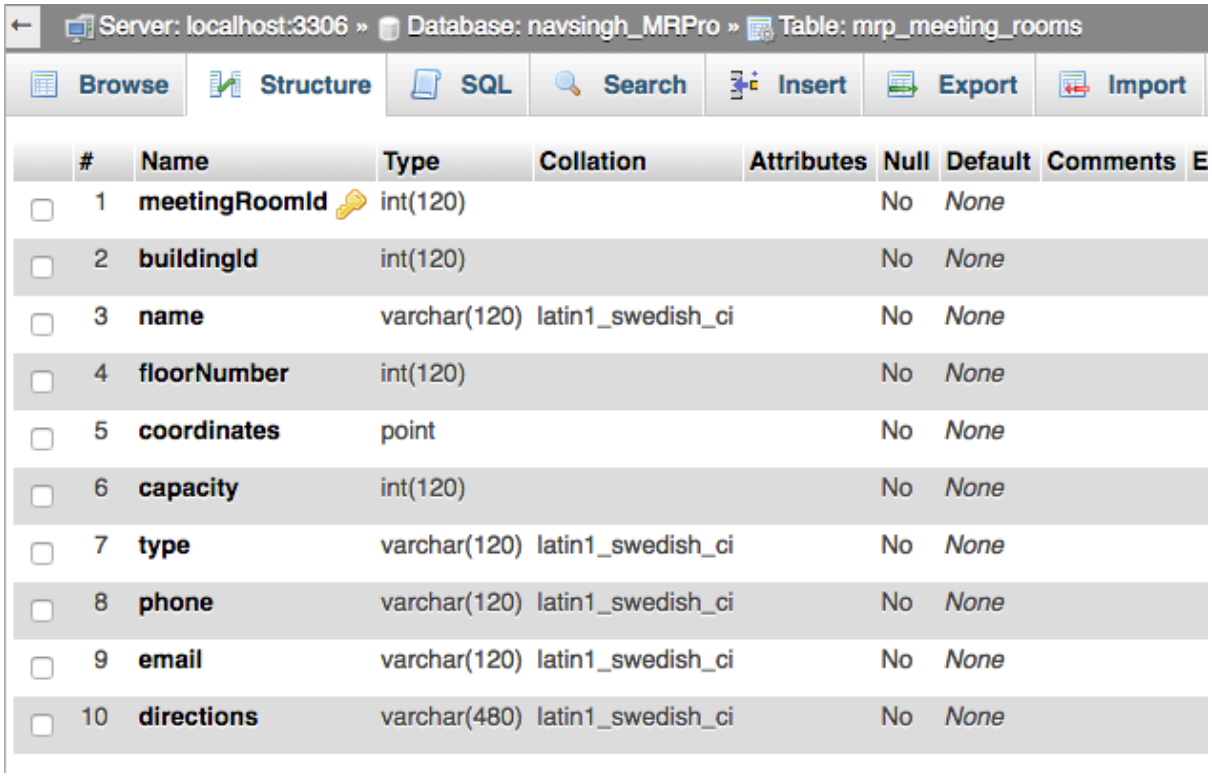



```
CREATE TABLE `navsingh_MRPro`.`mrp_meeting_rooms` (
  `meetingRoomId`INT(120) NOT NULL ,
  `buildingId` INT(120) NOT NULL ,
  `name` VARCHAR(120)NOT NULL ,
  `floorNumber` INT(120) NOT NULL ,
  `coordinates` POINT NOT NULL ,
  `capacity` INT(120) NOT NULL ,
  `type` VARCHAR(120) NOT NULL ,
  `phone` VARCHAR(120) NOT NULL ,
  `email` VARCHAR(120) NOT NULL ,
  `directions` VARCHAR(480) NOT NULL , PRIMARY KEY (`meetingRoomId`))ENGINE = MyISAM;
```

```
CREATE TABLE `navsingh_MRPro`.`mrp_buildings` (
  `buildingId` INT(120) NOT NULL ,
  `companyId` INT(120) NOT NULL ,
  `name` VARCHAR(120) NOT NULL ,
  `noOfFloors` INT(120) NOT NULL ,
  `coordinates` POLYGON NOT NULL ,
  `city` VARCHAR(120) NOT NULL ,
  `country` VARCHAR(120) NOT NULL ,
  `address` VARCHAR(240) NOT NULL ,
  `phone` VARCHAR(120) NOT NULL ,
  `email` VARCHAR(120) NOT NULL , PRIMARY KEY (`buildingId`)) ENGINE = MyISAM;
```

3 – Meeting Rooms Table (mrp_meeting_rooms) to store information regarding meeting rooms





#	Name	Type	Collation	Attributes	Null	Default	Comments	E
1	meetingRoomId	int(120)			No	None		
2	buildingId	int(120)			No	None		
3	name	varchar(120)	latin1_swedish_ci		No	None		
4	floorNumber	int(120)			No	None		
5	coordinates	point			No	None		
6	capacity	int(120)			No	None		
7	type	varchar(120)	latin1_swedish_ci		No	None		
8	phone	varchar(120)	latin1_swedish_ci		No	None		
9	email	varchar(120)	latin1_swedish_ci		No	None		
10	directions	varchar(480)	latin1_swedish_ci		No	None		

```
CREATE TABLE `navsingh_MRPro`.`mrp_meeting_rooms` ( `meetingRoomId`INT(120) NOT NULL , `build
ingId` INT(120) NOT NULL , `name` VARCHAR(120)NOT NULL , `floorNumber` INT(120) NOT NULL , `c
oordinates` POINT NOTNULL , `capacity` INT(120) NOT NULL , `type` VARCHAR(120) NOT NULL ,`pho
ne` VARCHAR(120) NOT NULL , `email` VARCHAR(120) NOT NULL ,`directions` VARCHAR(480) NOT NULL
 , PRIMARY KEY (`meetingRoomId`))ENGINE = MyISAM;
```

```
CREATE TABLE `navsingh_MRPro`.`mrp_meeting_rooms` (
  `meetingRoomId`INT(120) NOT NULL ,
  `buildingId` INT(120) NOT NULL ,
  `name` VARCHAR(120)NOT NULL ,
  `floorNumber` INT(120) NOT NULL ,
  `coordinates` POINT NOTNULL ,
  `capacity` INT(120) NOT NULL ,
  `type` VARCHAR(120) NOT NULL ,
  `phone` VARCHAR(120) NOT NULL ,
  `email` VARCHAR(120) NOT NULL ,
  `directions` VARCHAR(480) NOT NULL , PRIMARY KEY (`meetingRoomId`))ENGINE = MyISAM;
```

3 Final Report Xcode

Project Guide

This guide will help understand the requirement for opening and running this project- MeetingRoom Pro is an ios (Swift) project, in order to use open the project code we require the following:

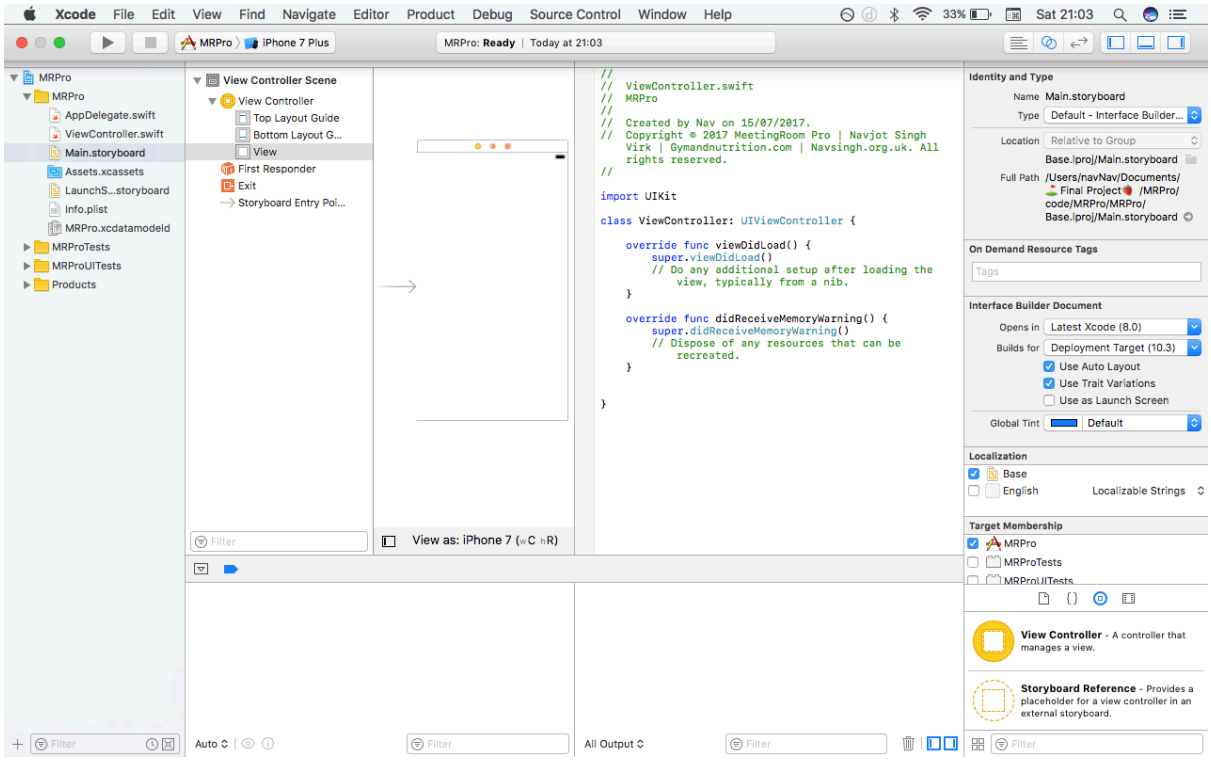
- Apple Mackbook (I am using Macbook Pro, 6 GB Ram, 2.3 GHz Intel Core i5)

Installing Xcode

Describe xcode and its features in detail in the final report.

Install Xcode on your Mac, using Appstore or this link:
https://developer.apple.com/xcode/ide/

This is how a project in Xcode Ide looks like –



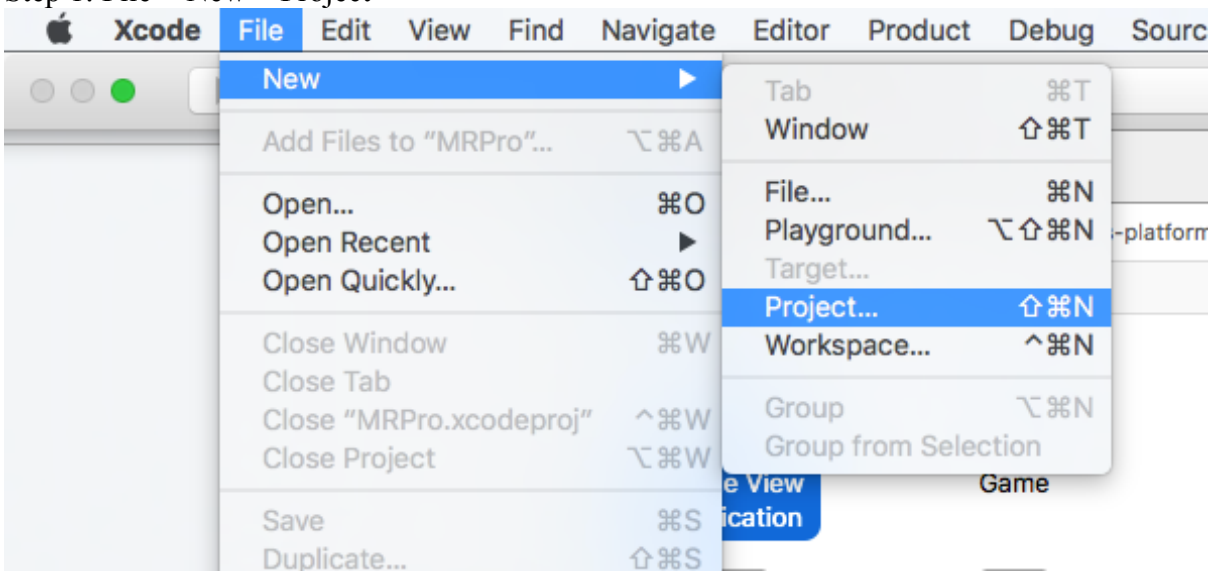
Opening the Project

Use MRPro.xcworkspace file to open the project in xcode.

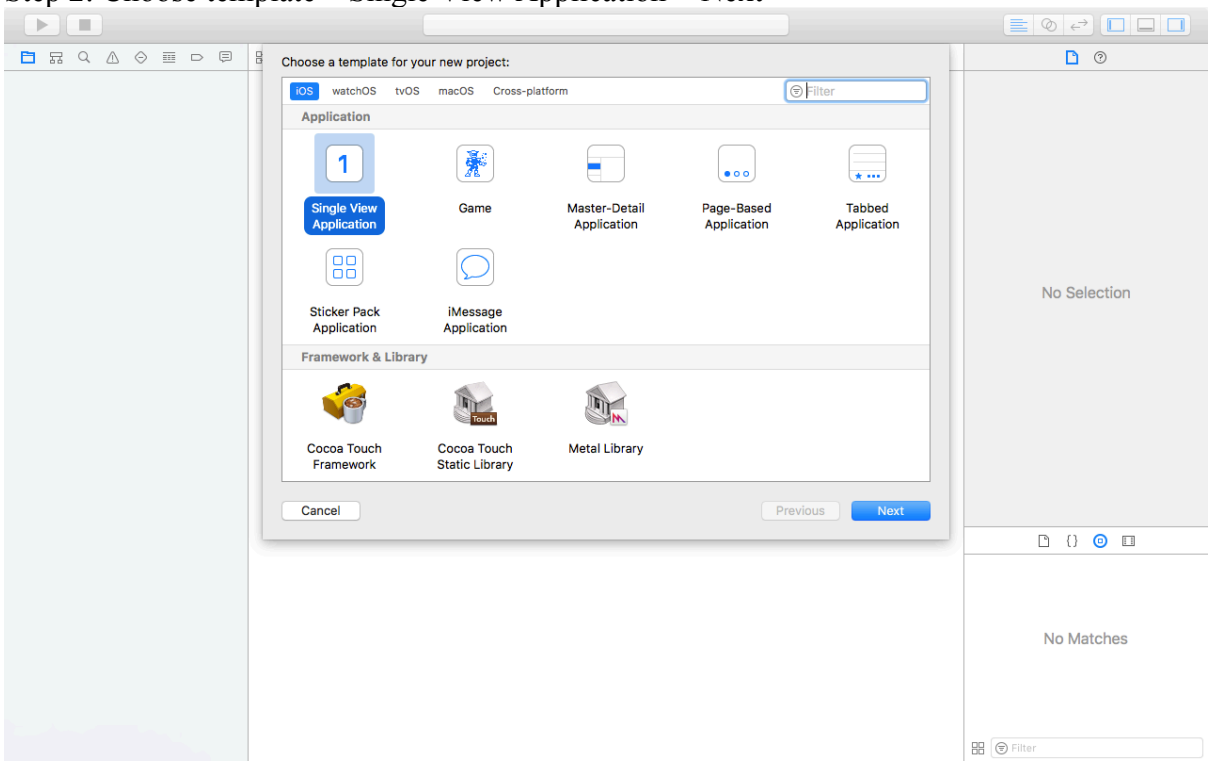
Creating Project

Basic Steps involved in Project Creation

Step 1: File > New > Project



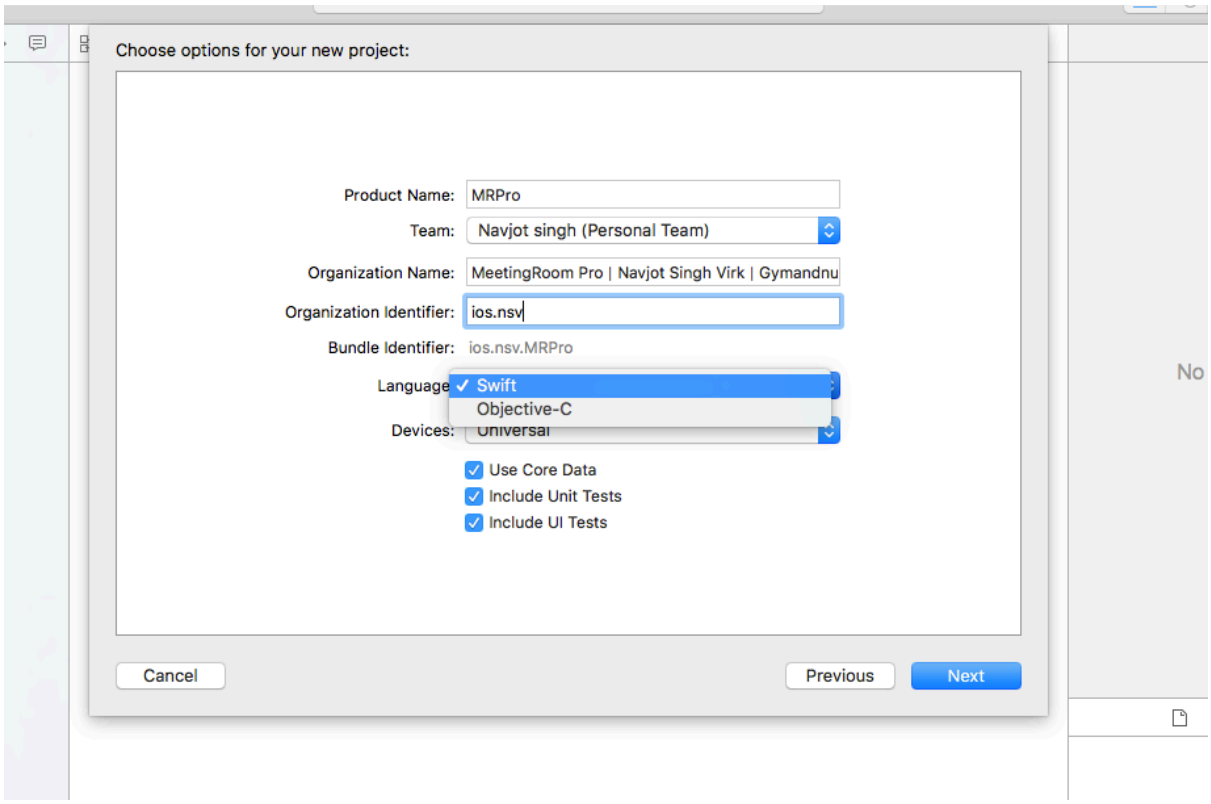
Step 2: Choose template – Single View Application > Next



Step 3:

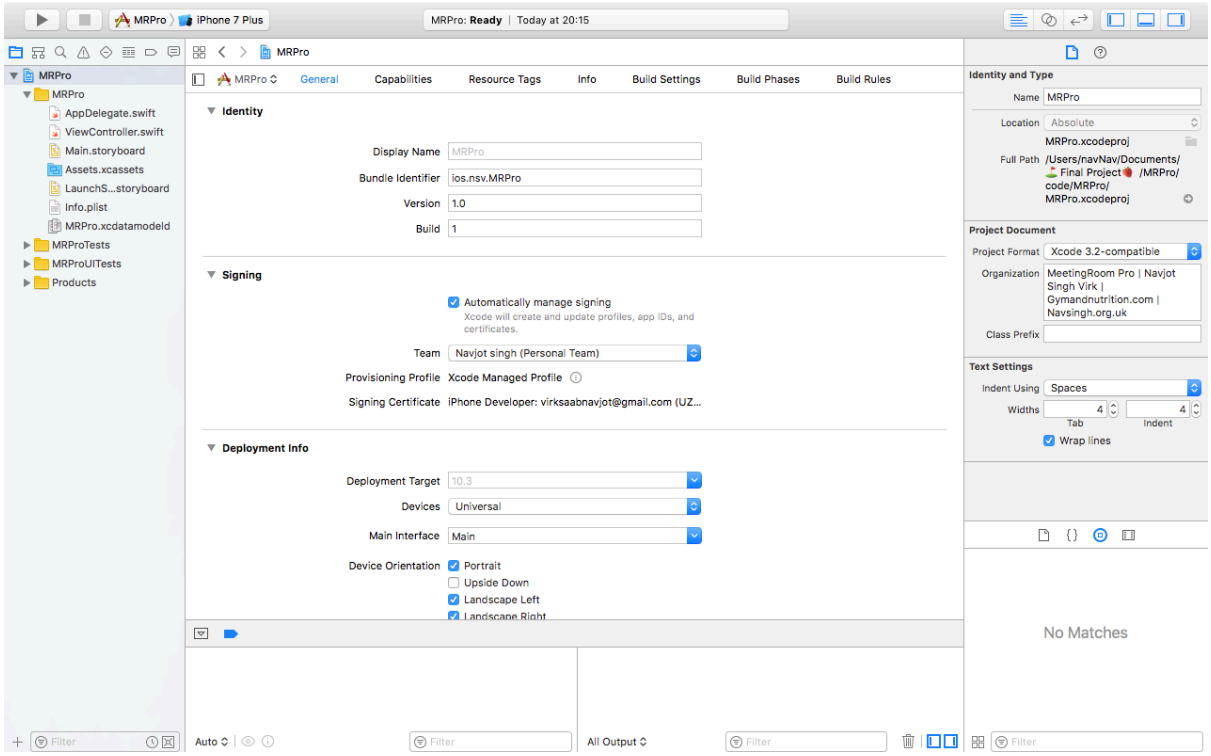
- Enter Product Name (aka. Project name) – MRPro (aka. MeetingRoom Pro)

- Select Team (Personal ios developer account – just signin with your apple id and xcode will take care of the rest)
- Organisation Identifier: ios.nsv (it could be anything (but unique) you like but it should usually make some sence and be short, simple and sweet like in this example- ios signifies its an ios app and nsv – Navjot singh virk)
- Select Language: Swift will be used for this project.
- Devices: Universal means the app will be supported on both iphones and ipads (you can also choose any one of them if you want to limit certain device type users).
- Others: Include UnitTests and UTests
- Press > Next



Step 4: Save the project on computer at location of your choice

Step 5: New Xcode project opens in a new window

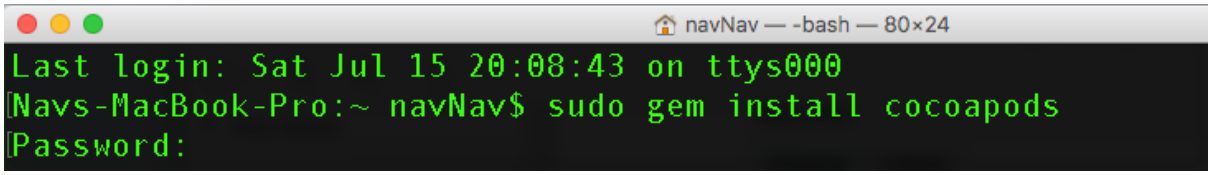


Step 6: At this stage project is ready and can be run on an emulator or a real ios device.

Step 7: Start making changes (write code)

Cocoapods

Installing Cocoapods (on my computer which will allow us to use different useful cocoapods available on the internet).



Explain cocoapods a bit in the final report

Create Pod File

In order to use Cocoapods we need to create a Podfile for our project.

- Open Terminal
- Navigate to the project folder
- To create the Podfile run this command in the terminal: $ pod init

```
22 gems installed
code/MRPro k-Pro:~ navNav$ cd /Users/navNav/Documents/⛵inal\ Project🍓 /MRPro/
Navs-MacBook-Pro:MRPro navNav$ ls
MRPro           MRPro.xcodeproj MRProTests      MRProUITests
Navs-MacBook-Pro:MRPro navNav$ pod init
Navs-MacBook-Pro:MRPro navNav$ ls
MRPro           MRPro.xcodeproj MRProTests      MRProUITests    Podfile
Navs-MacBook-Pro:MRPro navNav$
```

As we can see a Podfile was created when we ran the 'ls' command second time to list the contents of the project folder.

- Open Podfile in an editor and write > pod 'SwiftyJSON' to add our first pod that will help in handling JSON better (it's a very popular library/pod among ios developer community when it comes to handling JSON in ios Swift).

```
platform :ios, '9.0'

target 'MRPro' do
  # Comment the next line if you're not using Swift and don't want to use dynamic frameworks
  use_frameworks!

  # Pods for MRPro
  pod 'SwiftyJSON'

  target 'MRProTests' do
    inherit! :search_paths
    # Pods for testing
  end

  target 'MRProUITests' do
    inherit! :search_paths
    # Pods for testing
  end

end
```

- Save Podfile > Run this command in terminal - $ pod install
- Close project in Xcode.
- Open the newly generated – MRPro.xcworkspace. And now onwards everytime to open/work on the project MRPro.xcworkspace should be used instead of MRPro.xcodeproj