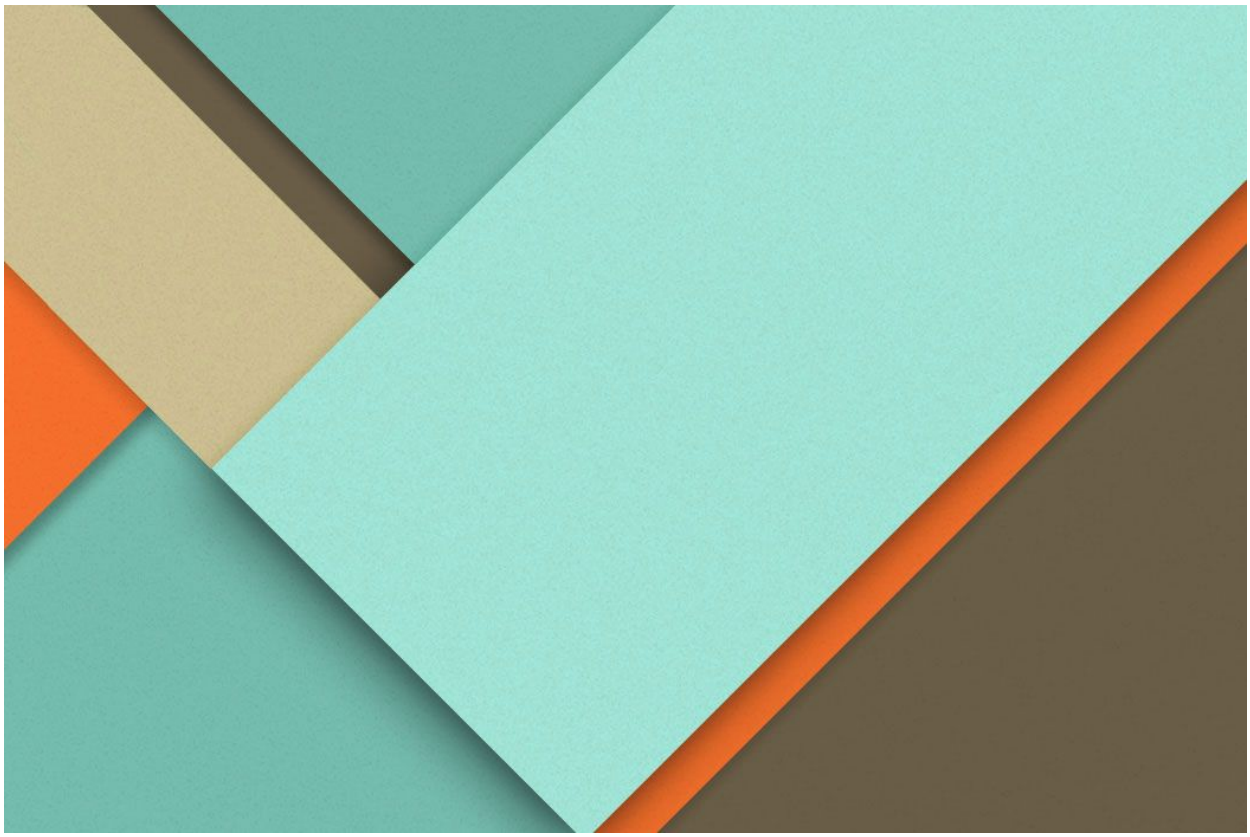

Internal Design Document

01.31.2017

Team 5: Inconceivable Golden Bear

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Introduction

To design a web-based HSBC internal desk booking system for 1600 desk locations. It will allow approximately 2000 staff members to reserve a desk location and resources for up to 5 days. The system handles concurrent usage of up to 30 users and maintains approximately 3000 active bookings.

Environments

Programming environment

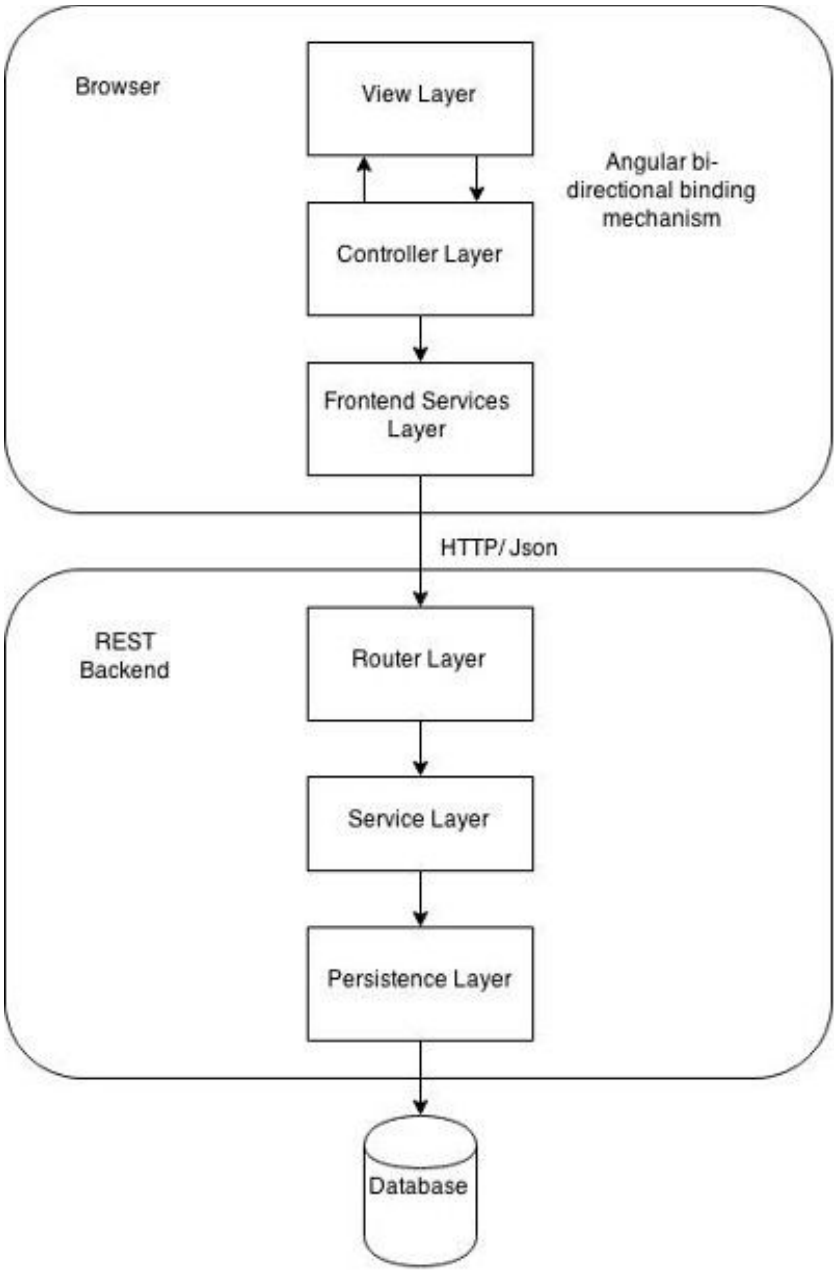
- Netbeans IDE 8.2 (Java EE 7 Web Version)
- Spring MVC 4.0.1 (Java backend framework)
- AngularJS 1.6.1 (Javascript frontend framework)
- PureCSS 0.6.2 (CSS library)
- MySQL 5.7.17 Community Server (database)
- MySQL WorkBench 6.3 (Visual tool for MySQL database management)
- Github (private repository)
- Lucidchart (online UML diagram tool)
- Apache Tomcat 9.0.0
- Languages: HTML, CSS, Javascript, Java, MySQL

Production and Test environments

- Google Chrome (version 56.0.2924.87) for Mac users
- Internet Explorer (version 11.576.14393.0) for Windows users
- All production and final test environments will be on the 3 Windows laptops we have, running locally using Internet Explorer, Apache Tomcat and MySQL.
- Backend testing: JUnit 4.12
- Frontend testing: Jasmine 1.3

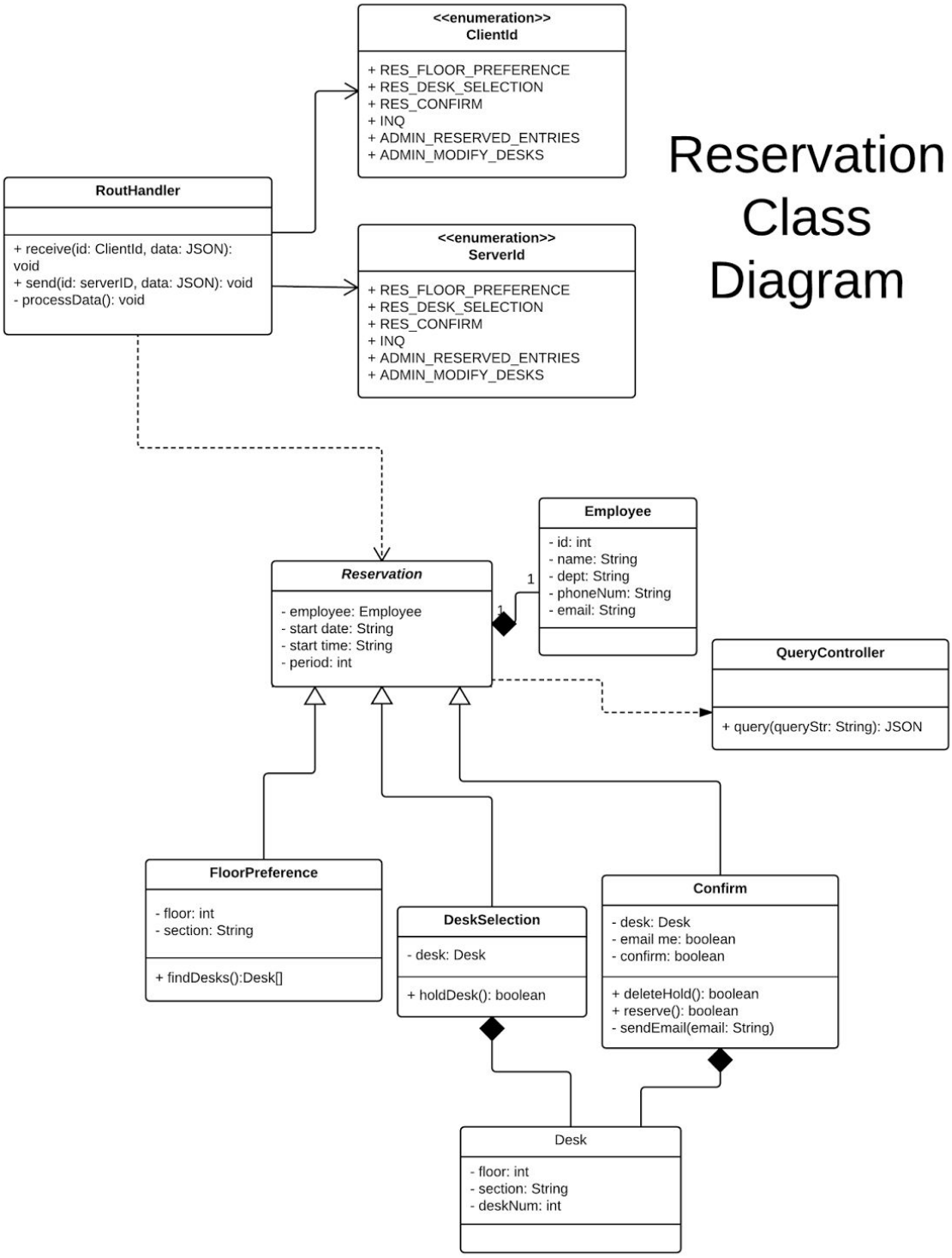
Software architecture

System Architecture[1]

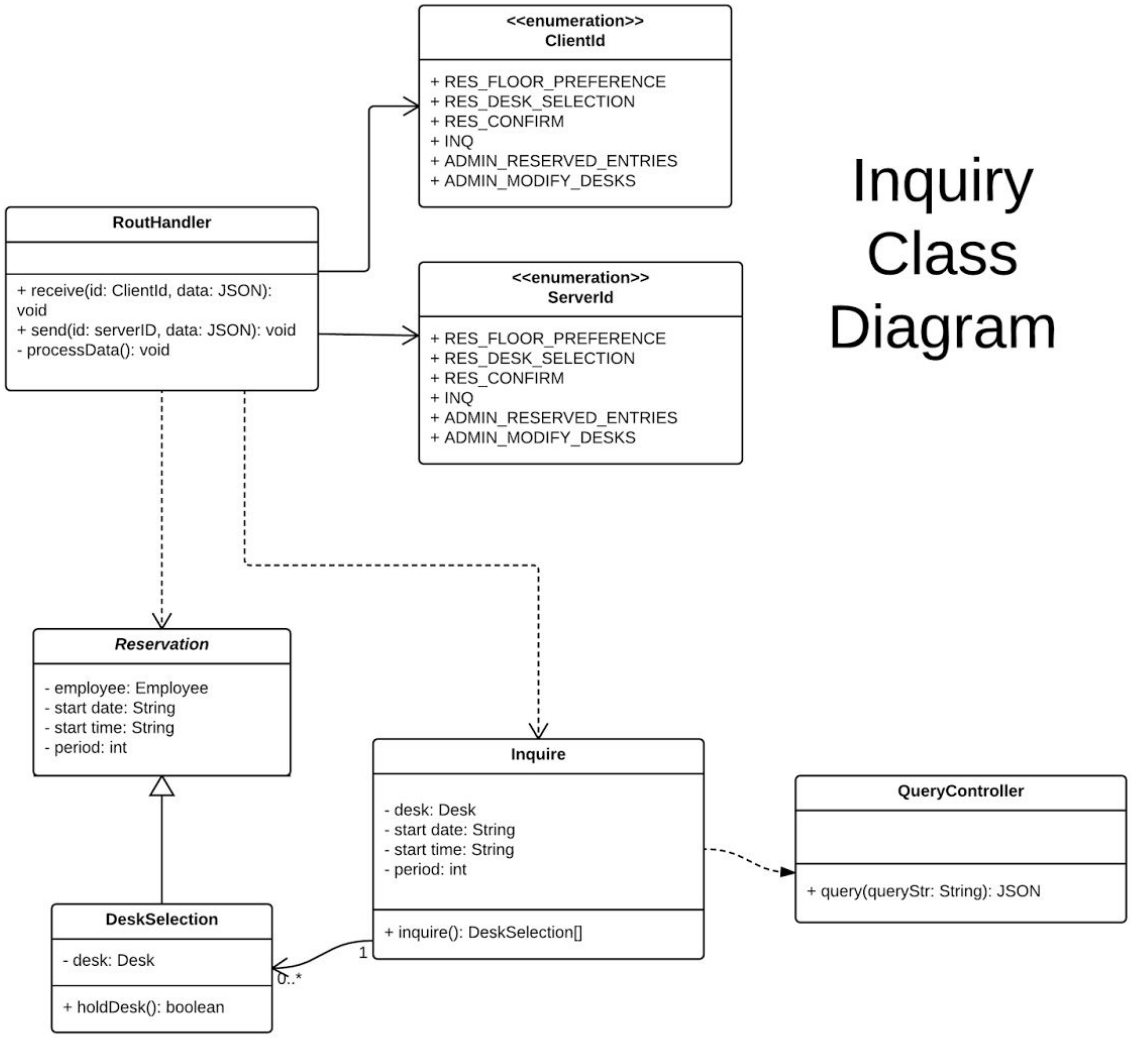


[1] Image taken from: http://blog.angular-university.io/developing-a-modern-java-8-web-app-with-spring-mvc-and-angularjs/

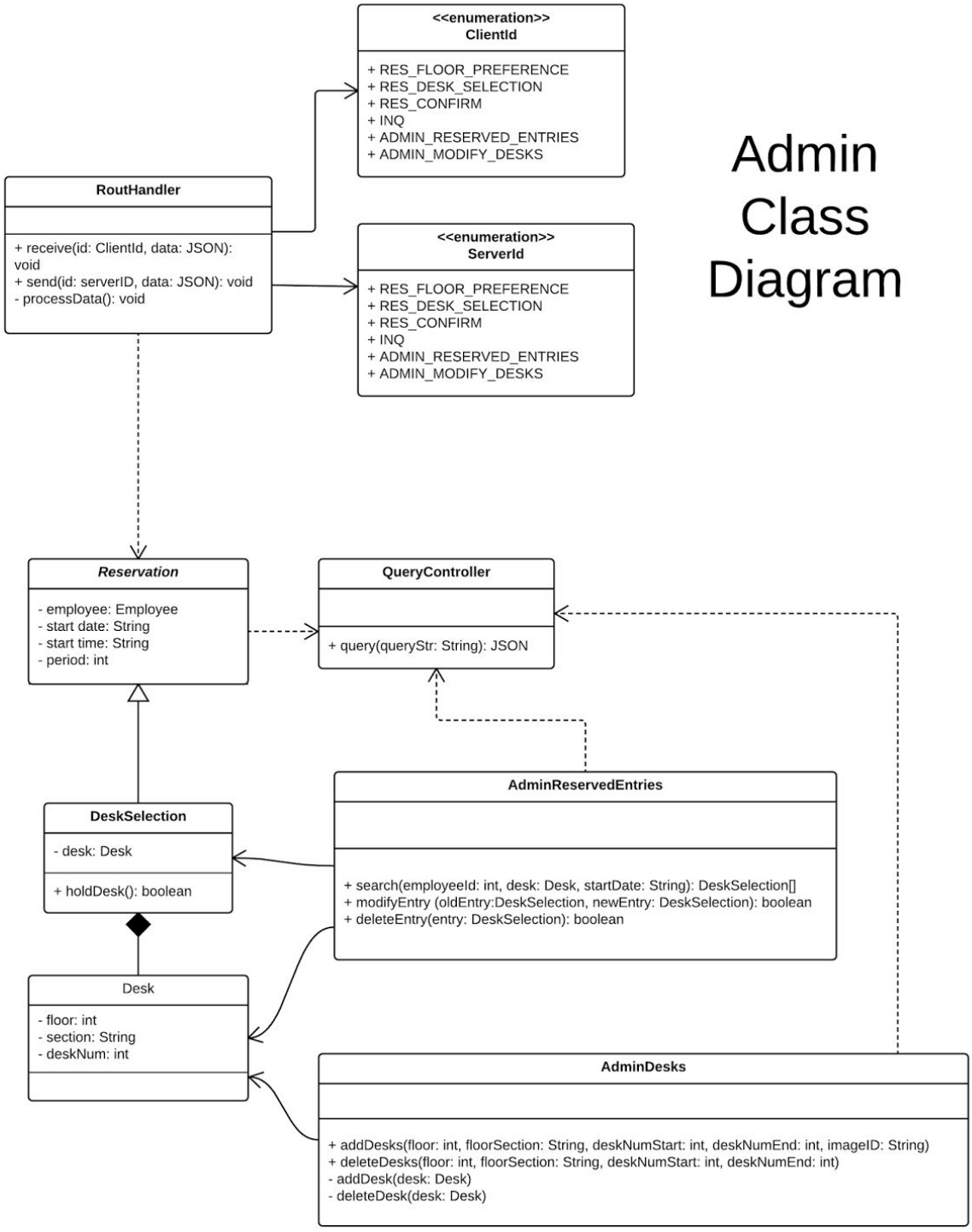
Back-end Class Hierarchy



Inquiry Class Diagram



Admin Class Diagram



Data design

Database Framework:

- MySQL 5.7.17 Community Server (database)
- MySQL WorkBench 6.3 (Visual tool for MySQL database management)
- normalized specifications

Normalization: Second Normal Form

Desk Table

number	location	floor	section	status
1.A.118	Broadway	1	A	good
1.B.110	Broadway	1	B	good
2.B.203	Broadway	2	B	broken

Desk Reservation Table

rid	empid	desk_number	created_datetime	start_datetime	end_datetime
001	11112222	1.A.118	2017-02-01 11:40:22	2017-02-05 08:00:00	2017-02-06 15:00:00
002	12345678	1.B.110	2017-01-15 16:23:44	2017-03-15 12:00:00	2017-03-17 16:00:00

Fake User Table

empid	name	extphone	country	jobrole	photourl	extemail	location	intphone	postal address
11112222	ELLIE LIU	11778 1234567	Canada	Software Developer	11112222.jpg	ELLIE LIU/HBCA/HSBC	383GIL	778	1234 Bread Road
12345678	COLLEEN VUONG	11604123 4567	Canada	Software Developer	12345678.jpg	COLLEEN VUONG/HSCA/HSBC	262GIL	604	4321 Butter Avenue

Located_In Table

desk_number	location_name
1.A.118	Broadway
1.B.110	Broadway

Location Table

name	**Address**
Broadway	2910 Virtual Way, Vancouver BC, V5M 0B2

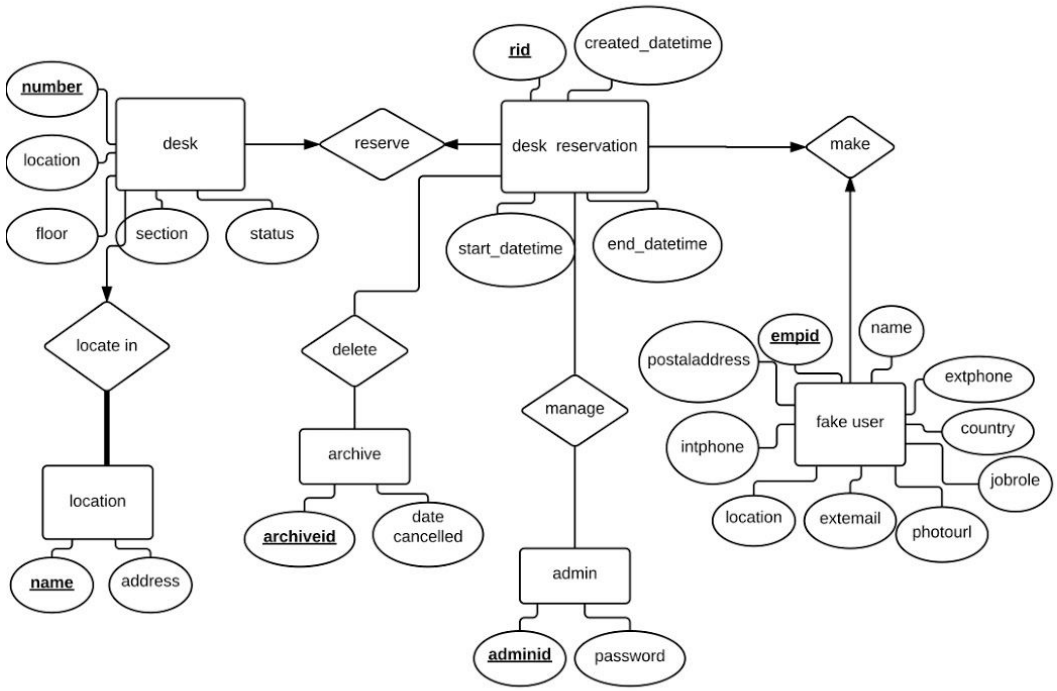
Admin Table

adminid	**Password**
ADMIN001	12345
11112222	54321

Archive Table

archiveid	**Data cancelled**
003	2017-02-06 15:30:30

- ER diagrams



API design

HSBC API will be used to retrieve staff information. Within the HTML header section, we just need to add this line to use HSBC API:

http://ssupdate.global.hsbc/myhsbc/uservariables.ashx

This will return a JSON key value pair with this info:
var staffDetails_name='JOHN DOE';
var staffDetails_empid='43868488';
var staffDetails_extphone='1 1 778 8743386';var staffDetails_country='CANADA';
var staffDetails_jobrole='HEAD OF WEALTH IT CANADA';
var staffDetails_dept='SWD WEALTH MANAGEMENT IT GENER';
var staffDetails_photourl='photos.global.hsbc/casual/square/4316/43868488.jpg';
var staffDetails_extemail='JOHN DOE/HBCA/HSBC';
var staffDetails_employeeType='E';
var staffDetails_location='3383GIL';
Var staffDetails_intphone='778';
var staffDetails_postaladdress='3383 Gilmore Way, Burnaby, B.C. V5G 4S1';
var errormessage='';

The values in brackets are the employee specific information as follows:
var staffDetails_name: Name of the employee
var staffDetails_empid: Employee ID, 8 digit format
var staffDetails_extphone: Employee phone number
Var staffDetails_country: Country where employee is based
var staffDetails_jobrole: Job role/position of the employee
var staffDetails_photourl: URL of employee's picture
var staffDetails_extemail: Internal email address
var staffDetails_location: Employee office location
var staffDetails_intphone: Phone location prefix
var staffDetails_postaladdress: Full office address

Algorithms

No complex algorithms used for this application.

Design trade-off

- UI/UX will be simplistic due to time constraints
- Performance may not be ideal given time constraints on testing and production environment being our own laptops
- need to make certain design decisions based on time, quality, performance, security or scope considerations).
- 10 minutes time range for confirmation page
- Immediately receiving confirmation e-mail

Notable risks

- Graphic display may only be able to display lower resolution PDF and JPG files less than 512MB in size.
- There is a need for an administration module to prevent all administrators forget their passwords.
- The risk of booking the tables that are unavailable (e.g. broken, missing a chair or being moved with current location).
- What if two people simultaneously book one table and will booking procedure still correctly execute?
- Will performance able to handle if it exceed the maximum capacity of live active bookings in the system?
- Can’t simulate actual performance using HSBC’s servers; all production code will be run on our local servers.