**Instructions**

* Due Date is **July 12, 2020**
* Points possible **50 out of 50**
* Late submission of a homework assignment is subjected to a 20% per late day penalty
* This assignment should be done individually.
* The submission should be either a pdf or word document.

You should submit around 5 pages’ report (it can be less or more) to address the following sections:

**1- Topic, scope, and use cases**

The selected topic can be by your own idea or you may select it in the following **business areas of data management systems**:

* **Job posting website** where hiring managers post jobs descriptions for openings in their companies, job seekers surf the website and query the posts to find a matching job for their skills.
* **Hospital management system**, the hospital has a number of beds which can be occupied by patients, each patient has (a) doctor(s) who is/are taking care of him.
* **Library Management Systems** that categories and index the books in the library. Students and teachers can borrow the books for certain time. The system assesses a fine to the record of any borrower who fails to return library materials on or before their due date. Accumulated fines will result in the suspension of borrowing privileges.
* **Hotel Management system** where each room in the hotel has a status, such as (occupied, vacant, out of service, etc.). guest occupy the room(s). Each room has it is own assets and categorized based on those assets. Each room category has a certain price.

Use cases for all scenarios (complete transactions) should be included, any tools to express all those scenarios are acceptable including - but not restricted to - software requirement specification or functional software requirements list. Some examples for hotel management system scenarios can be:

1. The guests book a room online for a night, the they selects the type of room that (s)he likes (smoking, non-smoking, pet-friendly, etc) and pay for reservation using a credit card,
2. The guest can cancel the reservation up to 24 hours before the check-in date.
3. The receptionist check-in the guests after confirming their ids.

**2-Different user levels (privileges)**

The client in the website can surf the internet site as a guest, or an authenticated user who has a profile on the site. The client is defined clearly in this section can be one of the following (based on the business area):

* patient who is looking for a doctor appointment, or a surgery which is must be assigned by a physicians, all these can be different users of the system.
* A client in the library management system is the borrower who can be one of 2 categories, a student or a teacher. A student can borrow the book for 1 month, while a teacher can borrow the book for the whole semester.
* A client in job posting website can be a recruiter or job seeker.
* the nurse can be assigned to many patients to take care of their daily needs during their stay in the hospital including measuring temperature, giving the medication, and some other chores.
* For hotel management system, the receptionist can check in/out the guest; the manager can give a discount. etc.
* Reciptionest, guest, system admin cn be different roles for the hotel management system.

**3- Queries**

The report has to provide at least 15 common questions about your project; those queries will help you design the project. For Job posting website, you may provide questions such as the following:

1. What is the most wanted job?
2. How many opening for a particular job?
3. What is the most paid job?
4. What are the openings in some particular area/city/country?

Any non-serious question will lead to mark deduction.

**4- Website design**

Follow the principles are discussed in the class to design your website, you need to draw the initial design of your site using hand sketching or software tool (paint), draw at least 6 sketches for the main views of your website to address the following points:

* **The theme of your site:** such as the colors, logos, look and feel, the footer, and the navigation bar.
* **Responsive design**: wireframes should show how the site will look like in different screen size.
* **Designing for accessibility:** how your website must be accessibility friendly. Here is some tips to do so: http://mashable.com/2014/04/22/website-disability-friendly/#dIZpaG6NyPq5

**4- Database design**

Your website must have a fully normalized database tables design; all relationships must clearly be identified as one-to-one, many-to-one, and many-to-many. You may use any tool/design to draw your database design such as (but not limited to) Entity Relationship ER design, the links between tables are defined, no implementation is required at this stage. So only the design is required (the columns, data type and relations). It is necessary to include the index design and which columns are going to be indexed and how you select those columns for indexing, and what type of index is used for each one of designed indexes.

**5-Data Analysis**

The website can generate reports such as performance, sales, services that are provided in time period, for example, how many job openings for each month during a specific year. For each room category (smoking, non-smoking) what was the occupancy rate for each month in 2017? For the library, what is the lending rate for each category during the year? How many surgeries have been done each month for each department in the hospital?

These kinds of reports can be achieved using grouping function in SQL; they help the decision-making process, for example, if the manager in the hotel notice that non-smoking rooms are less occupied during summer, he may offer some deals on the non-smoking rooms next summer based on the reports from last 3-4 years. Charts which are dynamically generated from data are encouraged.

**6- System administration, testing, and maintenance plan**

The report should address the following

* **Files naming convention** that works for all Operating systems OS.
* Elements and codes must be working on all different OS and browsers.
* Testing plan and quality assurance.
* Directory (Folder) structure that reflects the website main sections.
* Maintenance plans after the implementation.