

## **CSE2/4DBF 2022**

### **Assignment 1 – Part 1 (10%)**

**Due date: 11:59pm Monday, March 28, 2022 (AEST)**

#### **AIMS AND OBJECTIVES:**

- ✓ to represent a problem description given in natural language as an (Enhanced) Entity-Relationship model

**This is an individual Assignment. You are not permitted to work as a group when writing this assignment.**

**Copying, Plagiarism:** Plagiarism is the submission of somebody else's work in a manner that gives the impression that the work is your own. The Department of Computer Science and Information Technology treats plagiarism very seriously. When it is detected, penalties are strictly imposed.

**No extensions will be given:** Penalties are applied to late assignments (5% of total assignment mark given is deducted per day, accepted up to 5 days after the due date only). If there are circumstances that prevent the assignment being submitted on time, an application for special consideration may be made. See Student Handbook for details. Note that delays caused by computer downtime cannot be accepted as a valid reason for a late submission without penalty. Students must plan their work to allow for both scheduled and unscheduled downtime.

#### **SUBMISSION GUIDELINES:**

**This assignment is to be submitted in soft-copy (either PDF or JPEG) format using the submission link on LMS, by 11:59 pm Monday March 28<sup>th</sup>, 2022. The submission link can be found under “Assessment 1 - Part 1” on the Assessment section of our subject's LMS page.**

#### **SUBMISSION CHECKLIST:**

- ✓ Your (Enhanced) Entity-Relationship Model (EER) for the proposed database

Students are referred to the Department of Computer Science and Information Technology's Handbook and policy documents with regard to plagiarism and assignment return, and also to the section of '[Academic Integrity](#)' on the subject learning guide.

**PROBLEM DESCRIPTION:****ServiceMatch Database System**

*Servicematch* is an upcoming company based in Melbourne. Their primary purpose of business is to provide a platform where clients can access services, needed on a regular basis, easily. These services include heavy goods transportation, domestic and commercial cleaning, landscape and lawn maintenance and design, plumbing works, electrical works, construction and many more.

The business process starts with registered clients and service providers. Clients register with *Servicematch* using a simple registration form (**Appendix A**) and can then request for quotes on a service. From the perspective of the company, the clients are mainly classified as corporate and individual clients. Corporate clients are those who require services for professional purposes and individual clients are those who require services for personal or household purposes. For each of the registered clients, the company keeps record of their name, address, phone number and email address. Apart from this basic information, the company also keeps track of property ownership circumstances of the individual clients. They want to know whether a client is a property owner, or a tenant in a rental property. *Servicematch* uses the information for promotional purposes. For the corporate clients, the company also keeps track of the business information such as name of the corporation and business area.

Similarly, service providers or businesses registers (**Appendix B**) with the company with their details and are approached by the company if there is any suitable work for them. For the registered businesses, the contact person name, phone number, email address, business address, suburb, and ABN number are recorded. *Servicematch* do not allow a business to register with them unless they have a valid Australian Business Number. Moreover, the businesses are mainly of two categories, i.e. corporate businesses, who are registered as a company, and freelancers who are registered as single person service providers. *Servicematch* keeps track of these two categories, as they offer the some of the freelancers, free career seminars for continuous service improvement and future business expansion.

When a registered client requires assistance from *Servicematch*, the person creates a job request by filling up a job request form (**Appendix C**). Jobs can also be of two main categories. Casual jobs are only created by individual clients and are one-time events. On the other hand, contractual jobs are only created by corporate clients and have specific contract start and end date. Each job is assigned a unique job id, a job description, a level of urgency.

*Servicematch* maintains a collection of suburbs. Each suburb has a name and postcode. They also store information about adjacent suburbs. A suburb can have more than one adjacent suburb. Every created job is related to one suburb. Additionally, each job belongs to one of the predefined job industries. Each industry has a unique id and a title. When a business (both corporate and freelancer) registers, they are also required to select one or more industries to be affiliated with. Once a job is created, based on the suburb, the nearby businesses who are affiliated with the same job industry, are notified.

The interested businesses provide quotes for each job requests, based on the job description and urgency. A job can receive many quotes from different businesses. Similarly, a business can quote many jobs at the same time. The amount of money quoted by a business for a job, is also recorded. Once the client evaluates all the quotes, one business is assigned the job, and the information is recorded.

The payment system of *Servicematch* is a very simple one. The invoice is generated against each job that has a unique invoice number and the amount to be paid by the client to the business. One job can have multiple invoices associated with it.

The company further keeps track of the trade unions that represent some of the industries listed by *Servicematch*. The officials believe that if they have listed unions' contact details, it might be helpful to communicate easily with the businesses on a mass level. A trade union can represent more than one industry, for example, Mowers Union represents Landscaping and Mowing industries. However, each industry is represented by at most one trade union.

*Servicematch* allows the freelancers to become a part of elite members' club. Additionally, it also allows the trade unions to become elite members. The perks of being an elite member is to get invitation to different career seminars which are free and beneficial for businesses to thrive. An elite member is a registered freelancer or a union representative but not all freelancers or unions are elite members unless they have registered to be one. The invitation to different career seminars is sent to the elite members periodically along with the seminar details, i.e. title, date and time, venue and so on. Many members can attend a seminar, but the company does not allow a seminar to take place if there are less than 5 attendees. This rule helps justifying the cost of arranging an expensive seminar.

As the company is a newly formed enterprise, they do not have an online system yet, which is making things a lot harder for the employees. So, before moving to an online management system *Servicematch* wants a relational database system that can cater for their entire business process and emerging volume of data.

**TASK:**

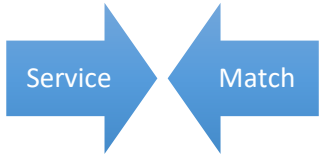
You are required to develop an **EER model** for the above problem description. The EER should contain all necessary information such as entities, attributes, primary keys, relationships (including specialization/union if any), cardinalities, and participation (including (min, max)). Any assumptions should also be stated clearly. If assumptions are made, it is important to make sure that the assumptions reflect possible real practice for a similar business and do not contradict with the problem description above. **Assignment should be typed, not written/drawn by hand. Use any software to draw figures in your assignment. However, make sure to follow the notations introduced in this subject (You can try several web-based drawing platforms such as draw.io or lucidchart.)**

[100%]

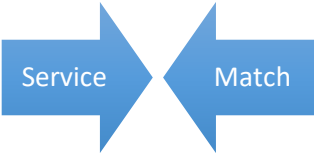
**Please note the following important points before you get started:**

- You are NOT required to transform your EER diagram into a set of tables for this part of the assignment.
- You are also NOT required to perform normalization of the user views provided in the appendices. The forms in the appendices should be used as a source of supplementary information for this assignment. For example, Appendix 1 may give you some clarity about what information is required to be stored for a client.

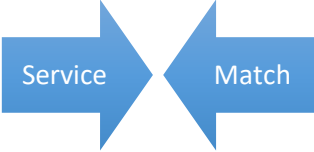
**Appendix-A: ‘Client Registration’ Form**

<b><i>Servicematch: Client Registration Form</i></b>			
Name:			
Address (Line 1):			
Line 2:			
Suburb:			
Postcode:			
State:			
Phone:			
Email:			
Client type: (Select one)	<input type="checkbox"/> Corporate	<input type="checkbox"/> Individual	
Property Ownership: (For individual clients only)	<input type="checkbox"/> Rental	<input type="checkbox"/> Owner	
Business company name: (For corporate clients only)			
Client Number:	..... (Office use only)		

**Appendix-B: 'Business Registration' Form**

<b><i>Servicematch</i>: Business Registration Form</b>			
Name:			
Australian Business Number (ABN)			
Address (Line 1):			
Line 2:			
Suburb:			
Postcode:			
State:			
Phone:			
Email:			
Business Category: (Select one)	<input type="checkbox"/> Corporate	<input type="checkbox"/> Freelancer	
Business Type:	<input type="checkbox"/> Cleaning <input type="checkbox"/> Heavy goods transportation <input type="checkbox"/> Landscape <input type="checkbox"/> Lawn and Backyard mowing <input type="checkbox"/> Plumbing <input type="checkbox"/> Electrical work <input type="checkbox"/> Roof restoration <input type="checkbox"/> General Construction <input type="checkbox"/> Demolition and rubbish removal		

**Appendix-C: 'Job Request' Form**

<b><i>Servicematch: Job Request Form</i></b>			
Client Number:			
Client Name:			
<b>Section A: Job request</b>			
Job Industry: (Select one)	<input type="checkbox"/> Cleaning <input type="checkbox"/> Heavy goods transportation <input type="checkbox"/> Landscape <input type="checkbox"/> Lawn and Backyard mowing <input type="checkbox"/> Plumbing <input type="checkbox"/> Electrical work <input type="checkbox"/> Roof restoration <input type="checkbox"/> General Construction <input type="checkbox"/> Demolition and rubbish removal		
Job Description (Line 1):			
Line 2:			
Line 3:			
Job Location (Postcode):			
Job Urgency: (Select one)	<input type="checkbox"/> Low	<input type="checkbox"/> Normal	<input type="checkbox"/> Immediate
Job Type: (Select one)	<input type="checkbox"/> Casual	<input type="checkbox"/> Contractual	
Preferred Contract: (Only for contractual job)	Start date:	End date:	
<b>Section B: Office Use Only</b>			
Job ID:			