CMPT 354 Module 1 Assignment

Due: February 7, 2021 @ 11:59 PM

Weighting: 8%

1. Overview

The purpose of this assignment is to test your ability to use conceptual modelling, such as ER and EER diagrams, to capture important aspects of a system which need to be stored in a database.

This assignment must be completed individually.

2. Submission

All submissions must be made through an electronic marking tool called Gradescope, which will also be used for providing feedback (enroll with the entry code M68KZM). You **must** record all your answers in the spaces provided in this document. Altering the format or layout of this document in anyway will attract penalties. You may however add landscape images in the submission boxes without changing the orientation of the page.

3. Marking

The Module 1 assignment counts for 8% of course mark.

4. Task

This assignment contains four different sections. Each section will contain a brief UoD providing contextual information regarding a system or organisation. For each section you will need to create an Entity Relational (ER) diagram or Extended Entity Relational (EER) diagram based on the UoD.

If the UoD is unclear regarding specific aspects of the brief you may note assumptions on your ER diagram. However, please beware that your assumptions must not conflict with or violate any aspects of the UoD.

Section A – BC's Vaccine Program

As part of the BC Government's fight against COVID-19 they have commissioned you to work with SFU to develop a new database system which tracks patient vaccinations.

Each patient in the system is identified by their Medicare number. In addition to this, their first name, last name and address (unit number, house number, street name, suburb, postcode) are recorded. Any allergies of the patient are also stored for safety purposes.

For each vaccine, the name of the vaccine, a brief description of the vaccine and the cost of the vaccine are recorded. The name of each vaccine is unique. Vaccines must have a safety classification. Each safety classification has a unique code, a description and a list of possible side effects. Several vaccines can have the same safety classification. BC health does not record the information of any vaccines with safety classification "MX3".

Patients can be administered several vaccines and a vaccine can be given to several patients. Some vaccines, however, may still be undergoing human trials and as such are not administered to patients. This system will only record patients who have been administered a vaccine.
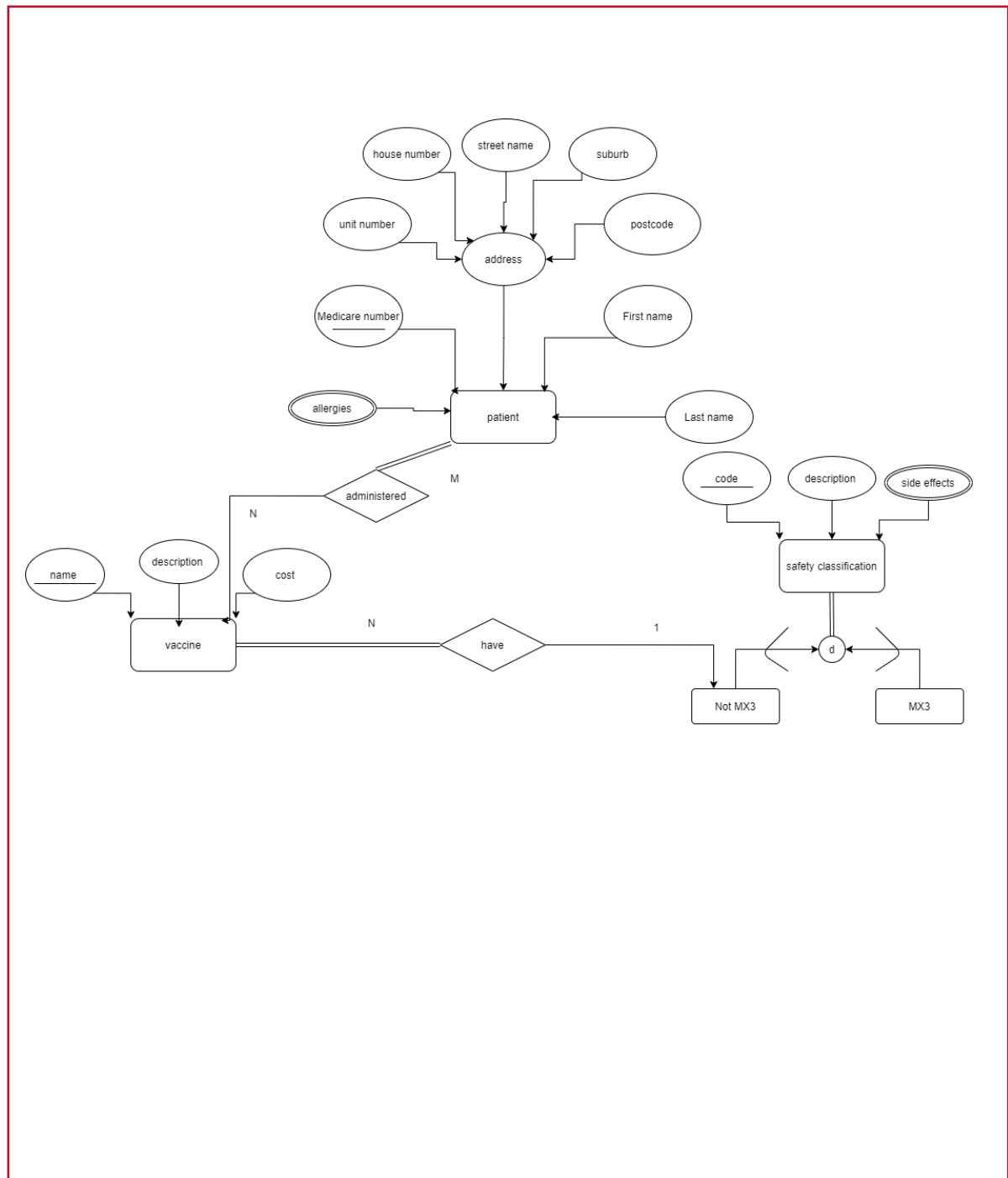
Section B – Royal Luggage

The royal family likes things just so. As such, it is of utmost importance that when they travel their luggage is not lost or misplaced. To assist in both managing and tracking the strenuous task of organising royal luggage, the Queen herself has formally requested you design a database system which can track the royal family's luggage. She has outlined the specification of this system below.

Each royal family member is identified by either a unique ID number or their full name which is made up of a first name, last name and suffix (e.g. I, II, Sr., Jr.). Their date of birth, email address and WhatsApp ID are also recorded. A trip, which is identified by its name, also contains a trip description, destination, itinerary and a number indicating the cost.

A royal family member will pack luggage for various trips. Each piece of their luggage for each trip is labelled sequentially with a number beginning from one. Thus, a piece of luggage can only be identified with respect to both the family member who packed it and the trip the luggage will be taken on. In addition, the size and colour of the bag are recorded along with each item which is in that piece of luggage.

Sometimes, however, a royal family member may not be able to complete a trip. In this case, the date they returned home from the trip and the reason for their return is recorded for the Queen's personal review later.
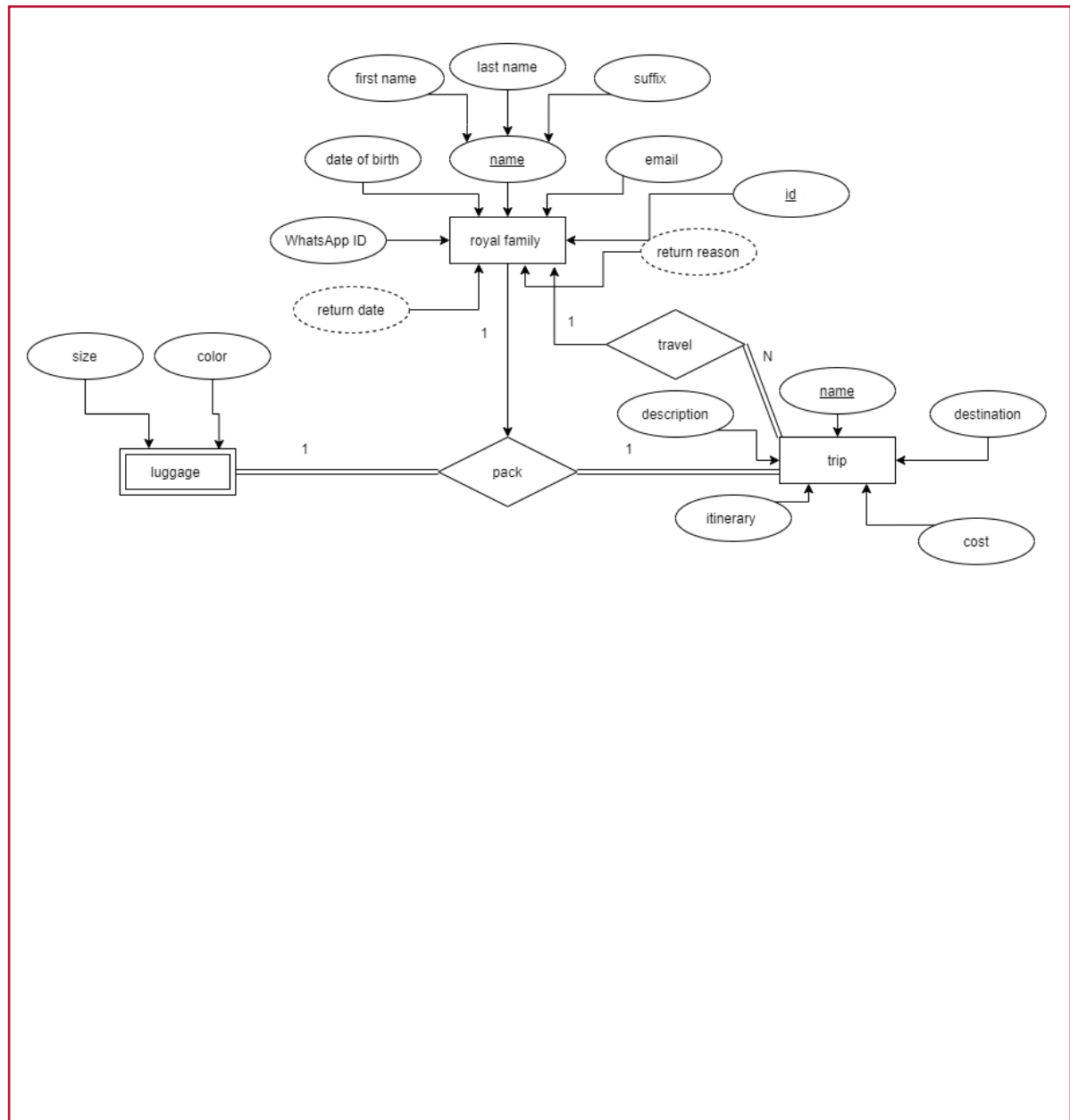
Section C - Auto Racing Competition

In order to increase the audience engagement at a yearly Auto Racing competition, the race organizers have approved a new program allowing patron to race specially modified Honda Civics around the track after hours. For insurance purposes however, all the information regarding these activities must be logged in a database.

Each patron is identified by either their full name (first name, middle initial, last name) or their driver's licence. The home address, phone number and any previous traffic infringements are also recorded. Each patron can select one modified Honda Civic as their favourite car.

For each modified Honda Civic, their unique serial number is recorded along with the number of seats, whether it is an automatic or manual, the last service date and if it is NOS (Nitrous Oxide Engine) enabled. There are three types of Honda Civics which are used, the Hatchback, the Coupé and the Sedan. For the hatchback, the rim type and brake calliper colour are also recorded. Additionally, for each Sedan the seat type is recorded.

All staff at the Auto Racing competition are identified with a StaffID but their first name, last name and phone number are also recorded. Some staff members are also race instructors for which their number of years' experience is recorded.

Each racing session includes a patron, race instructor and modified Honda Civic. The fastest lap time of each session is recorded along with a unique session timestamp.
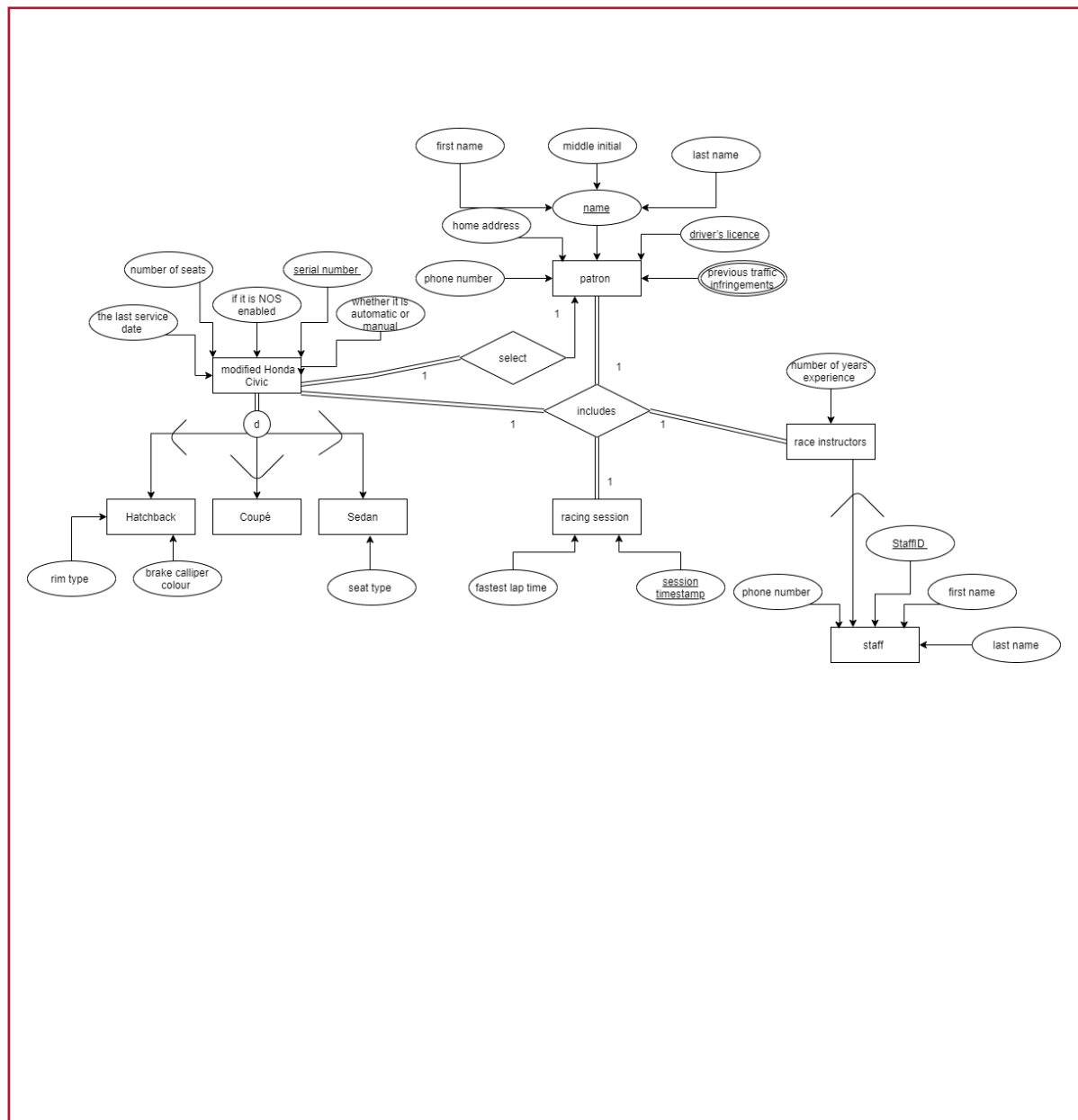
Section D – Pear Inc.

Daniel has decided to design a ground-breaking new series of laptops and mobile phones with the brand name "Pear". In his enthusiasm to revolutionise the IT industry, Daniel discovered that he has been losing track of all the new devices he invented, and the parts associated with them. As such, he wants you to create a database system to track his new creations.

Each device Daniel creates has a unique product name and a unique product ID. In addition to this, a brief description along with a recommended retail value are recorded. Devices fall into two distinct categories, mobile phones and laptops. For mobile phones, the screen size is recorded along with the camera quality and whether or not it has a headphone jack. For laptops however, the battery life, keyboard style and graphics card are stored.

Each device can have several parts. A part has a unique name and a unique part number. However, because a part may be used in several devices, parts can only be identified with respect to the specific device they are used in. The warranty, weight and technical description for each part is also recorded. Several parts may connect with each other in a device. The connection type between each of these parts is also stored.

Daniel has assigned several beta testers to try out the initial prototypes for his laptop range. For each beta tester, their first name, last name, phone number(s) and email addresses(s) are recorded along with their unique tester ID. They review each laptop once and submit a rating out of 10 in addition to a small text response.