Assignment 2

Aim

The objectives of this assignment include:

- Interpretation, analysis of conceptual schema to implement / modify structures in relational database
- Design and implementation of queries and data manipulations in SQL

Task 1 - Description

Background

The manager of a party (event) organizing company is undergoing a revamp of its business processes, to evolve its operations to a “digitized platform”. The manager has engaged your services to assist with the analysis, design and implementation of a database system for their needs.

The company has operated in the local scene for years, and has ambitions to expand to other markets internationally. As such, both its clients and chefs (which are hired on a part-time, contract basis) may come from local or overseas country.

After an initial round of requirements gathering and analysis, you have consolidated a list of important data requirements, as described below.

- In the first iteration of the project analysis, important data about the following : PartyEvent, Person, Client, Chef and Specialty must be represented in the database
- The client is typically someone who hire the company to hold a party event. It is possible that the client could represent another company (e.g. another organization holding Christmas party for its employees) , in which case, the 'client' is the contact person for that organization.
- Each client could hold multiple party events (as long as the events do not clash in terms of date, time, venue)
- In database, a Person is described by passport number, first name, last name, date of birth, gender, address, tel. number and email
- Conceptually, both Client and Chef have the same attributes as a Person. However, a client has additional attributes like preferred cuisine, preferred payment type, credit card number, credit card type and issuing bank. A Chef also has additional attributes like specialty, culinary certifications and competition experiences.
- A specialty represents a particular dish / cuisine that a chef is famous for. Each specialty is described by specialty number, description, ingredients and recipe.
- Depending on prior working experiences, a chef may have multiple specialties.

- It is possible for each chef to be engaged to work in multiple party events (especially if the clients leave "glowing reviews" on the food prepared by the chef!)
- Each Party Event is described by an event id number, party size, cuisine package, event date, event time and event venue.

From analyzing existing hardcopy documentations used by the company, you discover that there are other specific requirements for each piece of data, in terms of whether or not it is compulsory (hence, cannot be left blank), whether it is of fixed or variable length, whether it is numeric or alphanumeric, etc. All these requirements are summarized in the following table below.

Chef					
	Attributes	**Length**	**Size**	**Compulsory**	**Remarks**
	Culinary Certifications	Variable	300	Yes	Description of certifications attained from culinary academic institutions
	Competition Experiences	Variable	300	No	Description of any cooking competitions the chef has participated in

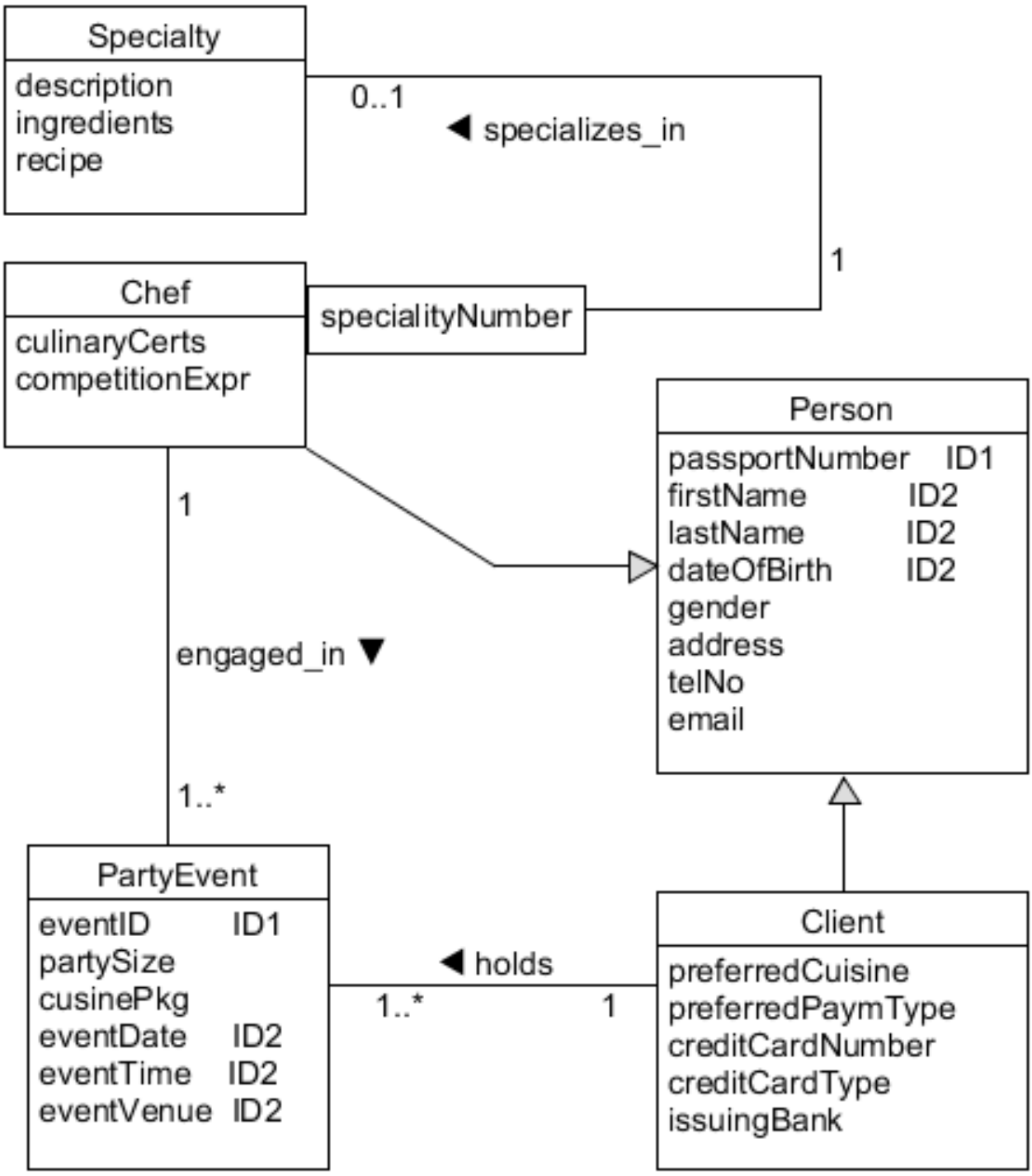
Specialty					
	Attributes	**Length**	**Size**	**Compulsory**	**Remarks**
	Specialty Number	Fixed	3	Yes	3 digit number 0-999
	Description	Variable	100	Yes	A short phrase describing the type of dish / cuisine (e.g. "Mediterranean Lava Chicken")
	Ingredients	Variable	300	Yes	Listing of all ingredients and quantity to use
	Recipe	Variable	1000	No	Step by step instructions of how to prepare the dish

Person					
	Attributes	**Length**	**Size**	**Compulsory**	**Remarks**
	Passport Number	Variable	20	Yes	
	First Name	Variable	30	Yes	
	Last Name	Variable	30	Yes	
	Date of Birth	Fixed	10	Yes	dd-mm-yyyy
	Gender	Fixed	1	Yes	'M' / 'F' / 'O'
	Address	Variable	50	Yes	
	Phone	Variable	20	No	
	Email	Variable	50	Yes	

Client					
	Attributes	**Length**	**Size**	**Compulsory**	**Remarks**
	Preferred Cuisine	Variable	100	No	For 'repeat' customers, captures the most frequently ordered dish / cuisine
	Preferred Payment Type	Variable	20	Yes	E.g. 'cash', 'credit card', 'cheque', etc
	Credit Card Number	Variable	20	No	
	Credit Card Type	Variable	20	No	E.g. 'Visa', 'Mastercard', etc
	Issuing Bank	Variable	50	No	Name of bank

PartyEvent					
	Attributes	**Length**	**Size**	**Compulsory**	**Remarks**
	Event ID	Fixed	10	Yes	
	Party Size	Fixed	3	Yes	3 digit number 0-999
	Cuisine Package	Variable	100	Yes	The cuisine package ordered by the client for the party
	Event Date	Fixed	10	Yes	dd-mm-yyyy
	Event Time	Fixed	5	Yes	Event start time, 00:00 - 23:59 hrs
	Event Venue	Variable	50	Yes	

Since last week, the manager has approved the latest draft of the conceptual schema as shown below :



Your most immediate work, is to :

a) via the process of logical design, translate the above conceptual schema into a set of relational schemas

b) based on your schemas in a), implement SQL script to create the necessary tables

c) V. IMPT NOTE => in transformation of generalization hierarchy, you ***must use*** the **'partitioning' method**

NEW FLASH !!!

Rumour has it, that there could be a management decision to approve new changes, to the conceptual schema and data requirements (which are not reflected in the designs above). These changes include :

(i) implementing automatic deletion of a (related) row of record in PartyEvent table, when a row from the Client table is deleted

(ii) increases the maximum length of competition experiences to 1000 chars

(iii) store in PartyEvent table additional, compulsory data :
- duration, fixed length, up to 2 digits, (represent length of time in hours)

(iv) to cater to international clients, store in the Client table additional, compulsory information :
- country of origin, variable length, up to 40 chars

d) in the event the changes (highlighted in the NEWS FLASH above) are confirmed, prepare a SQL script (using only ALTER TABLE statements) to make the necessary amendments to the tables created in step b).

Task 1 - Requirements

A) The business requirements described in the earlier "Task 1 - Description" section represents the latest (in on-going efforts) to document the user's needs. Whether you think it is complete or not, you are **not allowed to add or change requirements / attributes** to the specification given above!

B) For your final set of relational schemas :

- Save it into a text file, appending the following info just before your file extension (e.g. "... **_Schema.txt**").
- The schemas must be documented in a format described in the last few slides of the lecture file : (6) Logical Design

C) For your SQL statements to create the necessary tables :

- Save it as a SQL script appending the following info just before your file extension (e.g. "... **_Create.sql**").
- You are to only use CREATE TABLE SQL statements, and nothing else!
- When execution of your script returns no errors, connect to MySQL server, using command based interface `mysql`, and save a report, appending the following info before your file extension (e.g. "... **_Create.rpt**")

D) For your SQL script to address possible changes to the tables (described in NEW FLASH !!! section above) :

- Save it as a SQL script appending the following info just before your file extension (e.g. "... **_Alter.sql**").
- You are to only use ALTER TABLE SQL statements, and nothing else!
- Add comments to your SQL script, to indicate your answers to each question.

  (**e.g.** inside your script ...

```
/* Assn2, Task1, Qn(i)        */
/* ... */
/* Assn2, Task1, Qn(ii)       */
/* ... */
```

)
- When execution of your script returns no errors, connect to MySQL server, using command based interface `mysql`, and save a report, appending the following info before your file extension (e.g. "... **_Alter.rpt**")

E) For information on CREATE TABLE statements, please refer to :

- The slides in the lecture file : (9) SQL Data Definition Language (DDL) and
- Cookbook, "How to use data definition and basic data manipulation statements of SQL, Recipe 4.1 How to create and how to alter the relational tables?"

F) For information about creating reports from processing of SQL scripts, please refer to : Cookbook, "Recipe 3.1 How to use mysql? Command based interface to MySQL database server? Step 4 How to save the results of SQL processing in a file?"

G) Please refer to **Appendix A**, for details on deliverables & file naming conventions for this task.

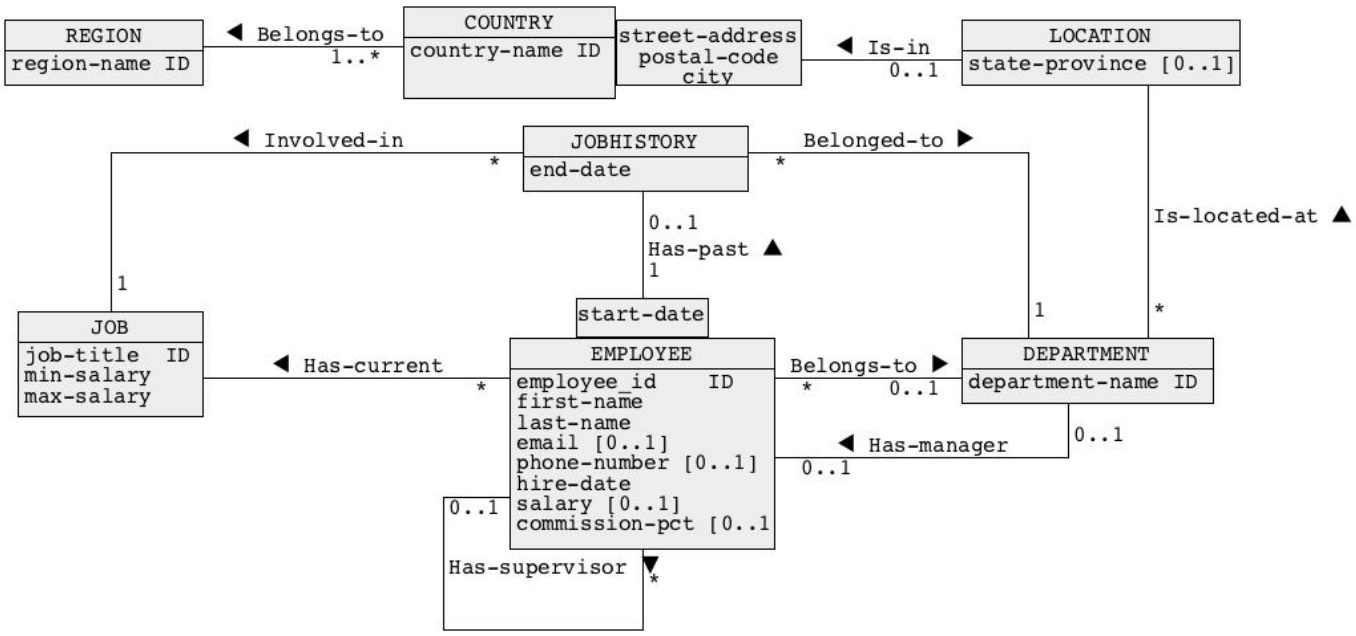
H) Please refer to **Appendix B**, for details on submission procedures and when to submit, for this assignment.

I) Please refer to **Appendix C**, which describes the assessment / grading guidelines for this assignment

Task 2 - Description

Background

A major multi-national corporation as employed you to research and implement SQL statements to support their data management operations. The company consists of several departments located in the cities all over the world. The company's database also contains information about the present and past jobs of its employees and about the present managerial structure. A conceptual schema of the database is given below.



For this task, please download the following files `A2dbcreate.sql`, `A2dbload.sql` and `A2dbdrop.sql`.

Connect to MySQL either through command line interface mysql or graphical user interface MySQL Workbench and execute script files `A2dbcreate.sql` and `A2dbload.sql`.

The script files create and load data into a database that contain information about a company and its employees.

NOTE : Please take some time to review the statements within the `A2dbcreate.sql`, `A2dbload.sql` and `A2dbdrop.sql` scripts as they hold **important clues** to guide you in your subsequent implementations of SQL statements!

You can implement your SQL statements, execute and test it using the data created and loaded from these scripts. (When you are done with testing your SQL statements, you can run `A2dbdrop.sql` script to remove the database from MySQL.)

For Task 2, please refer to the following business scenarios :

1) Using SELECT statements of SQL, find the employee id, first name, last name, job title and email of all employees working in Asia (i.e. all countries coming from the region 'Asia'). **This query must be implemented as a nested query!**

2) Using SELECT statements of SQL, find the employee id, first name, last name, job title and supervisor id of employees who had worked for more than 3 years and completed their jobs in the information technology department.

3) Using SELECT statements of SQL, find the employee id, first name, last name, hire-date, salary of supervisors, and the total number of employees directly supervised by each one of them. Display only those records of supervisors who supervised 8 or more employees.

NOTE :
For the business scenarios below, please implement them as sequences of `INSERT`, `UPDATE`, `DELETE` statements.

It is possible that each scenario below may require more than one data manipulation statement to be implemented. In some cases you must use advanced DML statements of SQL.

An important condition is that you are **NOT ALLOWED** to drop, to alter, and to create any consistency constraints during the modifications.

4) A supervisor (employee_id equal to 114) has resigned from the company, and today is the last day of work. With immediate effect, the department he manages, and all those employees he supervises will be taken over by his supervisor (i.e. employee 114's 'boss' will now supervise all those employees that used to work under him).

   Implement the necessary SQL statements to effect the "transfer of supervisor responsibilities" described above, as well as removing all information about this employee from the database.

5) A new employee Pamela Anderson has been hired at 18/10/2018 for the job of VIP Customer Relations. She works in the Public Relations department, assisting with coordination of meetings and management of company's relationship with all VIP clients. Her supervisor's employee id is 204. Her employee id is 888. Her new email address is pam.anderson@mail.com. Her salary is 8880. This employee does not have commission and phone number. A new job VIP Customer Relations needs to be added into the database. The salary of the job is between 6000 and 18000.

Task 2 - Requirements

A) The business scenarios described in the earlier "Task 2 - Description" section represents the latest (in on-going efforts) to support user's business operation needs. Whether you think it is complete or not, you are **not allowed to add or change requirements / wordings** to the specification given above!

B) For your SQL script to address all business scenarios (described in the earlier "Task 2 - Description" section) :

- Save it as a SQL script appending the following info just before your file extension (e.g. "... **_SQLStmts.sql**").
- Add comments to your SQL script, to indicate your answers to each question.

  (**e.g.** inside your script ...

```
/* Assn2, Task2, Qn 1)        */
/* ... */
/* Assn2, Task2, Qn 2)        */
/* ... */
```

)
- When execution of your script returns no errors, connect to MySQL server, using command based interface `mysql`, and save a report, appending the following info before your file extension (e.g. "... **_SQLStmts.rpt**")

C) Please refer to **Appendix A**, for details on deliverables & file naming conventions for this task.

D) Please refer to **Appendix B**, for details on the submission procedures and when to submit, for this assignment.

E) Please refer to **Appendix C**, which describes the assessment / grading guidelines for this assignment

APPENDIX A

File Naming Conventions

For **all files** in general, please use following naming format as a PRE-FIX:

<FT/PT>_<Your Grp>_A2-T1_<Stud. No.>_<Name>.<file extension>

- <FT/PT> Use "FT" for Full-Time student, "PT" if you are Part-Time student
- <Your Grp> refers to your SIM tutorial group (e.g. TutGrp1 / TutGrp2 / etc.)
- A1 if you are submitting assignment 1, A2 if submitting assignment 2, etc.
- T1 if file contains answers for Task 1, T2 if file contains answers for Task 2, etc.
- <Stud. No.> refers to your UOW assigned student number (e.g. 12345678)
- <Name> refers to your UOW registered name (e.g. JohnDoeAnderson)
- <file extension> refers to the type of file (e.g. .bmp, .doc, .xls, .uxf, .txt)

Deliverables

The deliverables include the following:

a) With reference to (earlier) section "Task 1 - Requirements", please submit :

i) A ***.txt** file of your final set of relational schemas

Please rename your file according to the required file naming convention!
E.g. =>**FT**_TutGrp1_A2-T1_**1234567_JohnDoeAnderson**_**Schema.txt**

ii) A ***.sql** file of your CREATE TABLE script

Please rename your file according to the required file naming convention!
E.g. =>**PT**_TutGrp1_A2-T1_**1234567_JohnDoeAnderson**_**Create.sql**

iii) A ***.rpt** file of the execution results for your CREATE TABLE script

Please rename your file according to the required file naming convention!
E.g. =>**FT**_TutGrp1_A2-T1_**1234567_JohnDoeAnderson**_**Create.rpt**

iv) A ***.sql** file of your ALTER TABLE script

Please rename your file according to the required file naming convention!
E.g. =>**PT**_TutGrp1_A2-T1_**1234567_JohnDoeAnderson**_**Alter.sql**

v) A ***.rpt** file of the execution results for your ALTER TABLE script

Please rename your file according to the required file naming convention!
E.g. =>**FT**_TutGrp1_A2-T1_**1234567_JohnDoeAnderson**_**Alter.rpt**

b) With reference to (earlier) section "Task 2 - Requirements", please submit :

i) A ***.sql** file of all your SQL statements

Please rename your file according to the required file naming convention!
E.g. =>**FT**_TutGrp1_A**2**-T**2**_**1234567**_**JohnDoeAnderson**_**SQLStmts.sql**

ii) A ***.rpt** file of the execution results for yourCREATE TABLE script

Please rename your file according to the required file naming convention!
E.g. =>**PT**_TutGrp1_A**2**-T**2**_**1234567**_**JohnDoeAnderson**_**SQLStmts.rpt**

c) Compress all your assignment files into a **single zip file**. Please use the following naming format :

<FT/PT>_<Your Grp>_A2_<Stud. No.>_<Name>.ZIP

Example : FT_TutGrp3_A2_1234567_JohnDoeAnderson.ZIP

- <FT/PT> Use "FT" for Full-Time student, "PT" if you are Part-Time student
- <Your Grp> refers to your SIM tutorial group (e.g. TutGrp1 / TutGrp2 / etc.)
- A1 if you are submitting assignment 1, A2 if you are submitting assignment 2, etc.
- <Stud. No.> refers to your UOW assigned student number (e.g. 12345678)
- <Name> refers to your UOW registered name (e.g. JohnDoeAnderson)

d) A Q&A / demo / testing will be held during lab session. You must be prepared to present / perform certain tasks / answer questions posed by the tutor, regarding your application of the process and the final answer in your submission.

APPENDIX B

How to Submit – Normal Workflow

A) Please double-check that all your filenames are in the correct naming convention

B) Please submit via Moodle using the following steps:

(i) Login to your Moodle account

(ii) Select the site for this Subject : CSIT115 Data Management and Security

(iii) Scroll down and look for the section on Submissions

(iv) Click at the link "**in this place you can submit the outcomes of Assignment . . .**"

(v) Click at a button "**Add Submission**"

(vi) Use the link "**Add . . .**", OR drag your **ZIP** file into the area "**You can drag and drop files here to add them . . .**"

(vii) Click at a button"**Save changes**"

(viii) Click at a button "**Submit assignment**"

(ix) Click at the checkbox with a text attached : **By checking this box, I confirm that this submission is my own work**, … in order to confirm the authorship of your submission

(x) Click at a button **Continue**

(xi) … and that's it!

C) Please take note of the following submission policies

(i) Only one submission of this assignment is allowed and only one submission per student is accepted

(ii) A submission marked by Moodle as "late" is always treated as a late submission no matter how many seconds it is late.

(iii) A submission that contains an incorrect file attached is treated as a correct submission with all consequences coming from the evaluation of the file attached. (i.e. no marks can be given if file does not contain the required content!)

How to Submit – "Emergency" Workflow

In the event of UNFORSEEN SITUATIONS :

(E.g. New student+skip orientation, joining the current quarter as the 1st semester, Student's moodle account not ready, cannot login to moodle, forget password, eLearning site down on submission day, repeated interrupted internet connection, unable to upload assignment, etc)

Please submit your Assignment using the following steps :

A) Please double-check that all your filenames are in the correct naming convention

B) Compress all your assignment files into a **single zip file**. Please use the following naming format :

<FT/PT>_<Your Grp>_A2_<Stud. No.>_<Name>.ZIP

Example : FT_TutGrp1_A2_1234567_JohnDoeAnderson.ZIP

- <FT/PT> Use "FT" for Full-Time student, "PT" if you are Part-Time student
- <Your Grp> refers to your SIM tutorial group (e.g. TutGrp1 / TutGrp2 / etc.)
- A1 if you are submitting assignment 1, A2 if submitting assignment 2, etc.
- <Stud. No.> refers to your UOW assigned student number (e.g. 12345678)
- <Name> refers to your UOW registered name (e.g. JohnDoeAnderson)

C) Please email your single zip file to your tutor at :

csit115@yahoo.com for ***FULL*** TIME students

kttan007@gmail.com for ***PART*** TIME students

In your email **subject** line, type in the following information :

<FT/PT> <Your Grp> <assignment info> <**student number**> and <**name**>

Example:

To : **tutor's email** (see above)

Subject : FT TutGrp1 A2 1234567 JohnDoeAnderson

Note1 : The timestamp shown on tutor's email Inbox will be used to determine if the assignment is late or not.

Note2 : After email submission, your mailbox's ***sent folder*** would have a copy (record) of your sent email, please **do not delete** that copy !! It could be used to prove your timely submission, in case the Tutor did not receive your email!

When to Submit

A) After the submission of deliverables, students may be given a chance to explain / demo their understanding of the process, and how they derive their answers. Depending on the time-table, a demo / Q&A / testing for your assignment may be scheduled during the

- 3rd - 5th lab session for the semester (i.e. lab 3 - 5), for Full Time (**FT**) students
- 2nd - 4th lab session for the semester (i.e. lab 2 - 4), for Part Time (**PT**) students

Further instructions will be given by the Tutor during the subsequent respective labs. Please consult your tutor for further details. Some time would be allocated for each student to present / demo / explain his solution during the session. Please pay attention as failure to adhere to instructions may result in deduction of marks.

B) Please refer to the following table which contains general info on the different submission events and deadlines

Assignment	**Submission Deadline (check Moodle for EXACT date-time)**		**Assignment Demo / Q&A / Testing (Tasks), during your respective ...**
	PT (must be before ...)	FT (must be before ...)	
1	Lab 2	Lab 3	Lab 2(PT), Lab 3(FT)
2	Lab 3	Lab 4	Lab 3(PT), Lab 4(FT)
3	Lab 4	Lab 5	Lab 4(PT), Lab 5(FT)

Note: (PT) = Part Time Students, (FT) = Full Time Students !

C) Non-submission of any of the above mentioned deliverables will result in ZERO marks! Please check with your Tutor personally if you are unsure!

APPENDIX C

! VERY IMPORTANT !

PLEASE FOLLOW ALL THE INSTRUCTIONS STATED IN ALL THE APPENDICES !!

IT IS CRUCIAL THAT YOU FOLLOW CLOSELY ALL POINTS STATED IN TASK REQUIREMENTS

IF YOU ARE **NOT SURE**,

PLEASE **CHECK WITH YOUR TUTOR** DURING LABS / LECTURES !

MARKS WILL BE DEDUCTED IF YOU FAIL TO FOLLOW INSTRUCTIONS !!

Assessment Guidelines

In general, student's deliverables will be assessed based on the following principles :

(i) Whether the submission has adhered to the instructions (painstakingly elaborated) in the assignment document. For example, marks may be deducted for situations like :

- missing / partial / incorrect file naming conventions
- incorrect file format (e.g. submitting *.**xlsx** instead of *.**xls**)
- partial / non submission of required deliverables
- late submissions / plagiarism
- submitted files cannot be opened by the relevant software
- content in deliverables is partially or totally different from what is stated in task requirements (e.g. drawing use case diagram instead of class diagram)
- content in deliverables does not conform to the required format (e.g. adding 'strange' notations / symbols in diagrams which are not part of UML syntax)
- failure to fulfill the administrative instructions stated in the assignment in general
- inability to explain / demonstrate understanding of own answers, during Q & A

(ii) With regards to requirements stated under the Sections "**Task Requirement**" (for different tasks), the following guidelines apply :

- ***Coverage :*** How much of the information mentioned in the Task Description has been considered in your process and your final answer
- ***Clarity / Accuracy :*** Are there any portions of your process / final answer that is unclear or subject to multiple interpretations. Are there any attempts to use different examples to prove your understanding?
- ***Verification :*** Successful demonstration, clarity of communication and satisfactory answers given during Q & A