

CSIE4105 Database Systems

Homework # 1

Due on 10/13/2022

1. (30%) Install a DBMS, such as MySQL, MariaDB, or PostgreSQL, on a computer. Use the **default database** of the DBMS or create *your own database*. Practice at least **three** of the following commands: SHOW (SHOW DATABASES, SHOW TABLES, SHOW COLUMNS), DESCRIBE, CREATE DATABASE, CREATE USER, and GRANT. Show **three** screen snapshots of the major installation steps and **one** screen snapshots for each selected command to manipulate the database.
2. (10%) Describe the **main characteristics** of the database approach.
3. (15%) Consider the three-schema architecture of database.
 - a. (5%) Draw and specify the **three-schema architecture**.
 - b. (10%) What is the difference between **logical data independence** and **physical data independence**?
4. (10%) Define the following terms:
 - a. (5%) data model
 - b. (5%) database schema
5. (15%) Cardinality ratios often dictate the detailed design of a database. The cardinality ratio depends on the real-world meaning of the entity types involved and is defined by the specific application. For the *binary relationships* below, suggest **cardinality ratios** based on common-sense meaning of the entity types. **Clearly state any assumptions you make.**

	Entity 1	Cardinality Ratio	Entity 2
1.	Student		StudentID_Card
2.	Student		Advisor
3.	ClassRoom		Wall
4.	Student		CourseSection
5.	Course		TextBook

6. (20%) Consider the following *application form* for school suspension (drop-out), leave, and refund. Suppose that the school is designing a system to allow students to fill the application form online and you are responsible to design the database for the system. Note that the signatures of students and parents (or guardian) on the application form will be scanned as images and stored in the database.

- a. (20%) Draw an **ER diagram** for the database. Identify the **entities** and specify the **relationships** among the entities. Indicate the **cardinalities** that can be inferred from the data on the form.

國立臺北科技大學學生休（退）學申請、離校、退費單

編號：

姓名			學號			系所	系(所)		班級	<input type="checkbox"/> 博士班 <input type="checkbox"/> 碩士班 <input type="checkbox"/> 大學部 <input type="checkbox"/> 專科部	年級 班
連絡地址									連絡電話		
休退學期間及原因	休學紀錄	<input type="checkbox"/> 未曾休學 <input type="checkbox"/> 曾休學____學年____學期			申請期間	自____學年度第____學期起休學			<input type="checkbox"/> 1 學期 <input type="checkbox"/> 1 學年		
					休學原因	<input type="checkbox"/> 健康因素 <input type="checkbox"/> 經濟因素 <input type="checkbox"/> 成績因素 <input type="checkbox"/> 工作因素 <input type="checkbox"/> 家庭因素 <input type="checkbox"/> 操行成績 <input type="checkbox"/> 志趣不合 <input type="checkbox"/> 服兵役 <input type="checkbox"/> 其他因素_____					
	退學學期	自____學年度第____學期起退學			退學原因	<input type="checkbox"/> 健康因素 <input type="checkbox"/> 經濟因素 <input type="checkbox"/> 成績因素 <input type="checkbox"/> 工作因素 <input type="checkbox"/> 家庭因素 <input type="checkbox"/> 操行成績 <input type="checkbox"/> 志趣不合 <input type="checkbox"/> 服兵役 <input type="checkbox"/> 其他因素_____					
	申請人簽章	日期：____年____月____日			大學部及專科部學生申請休(退)學須家長或監護人簽章，並請另附家長或監護人簽名蓋章之同意書（以空白紙書寫即可），研究生免。	家長簽章	日期：____年____月____日				

National Taipei University of Technology

English Application Form for School Suspension (Drop-out), Leave, and Refund, **No.:**

Name		Date of Application (YYYY/MM/DD)		Application	<input type="checkbox"/> Suspension <input type="checkbox"/> Drop-out (Leave the following blank)	Date of Resumption	YYYY/MM
Student ID No.		ID No.		Term of Suspension	From Year____, _____ Semester	Signature	
Department/Graduate Institute		Reason for Suspension (Drop-out):		for <input type="checkbox"/> Semester 1 <input type="checkbox"/> Year			
Class	<input type="checkbox"/> Doctoral Program <input type="checkbox"/> Grade of Master Program <input type="checkbox"/> Undergraduate Program	<input type="checkbox"/> Health <input type="checkbox"/> Economic Factor <input type="checkbox"/> Academic Result <input type="checkbox"/> Not compliant with Interest <input type="checkbox"/> Military Service <input type="checkbox"/> Conduct <input type="checkbox"/> Other_____		Suspension	<input type="checkbox"/> Never <input type="checkbox"/> Have been suspended for____Year Semester	Cellphone No.	
Signed by Parent				For students (excluding graduate students) applying for suspension (drop-out), the parent or the guardian shall present the consent and the signature.			
Address:							