MASY-GC 3500 Database Design & Management

Spring 2022, Section 200

Group Name: Group E

Group Members:

Zhiwei Liang, Felix Huang, Peilin Li, Jiaxuan Wang, Borui Li, Jay Jiang

Date: May 9th, 2022

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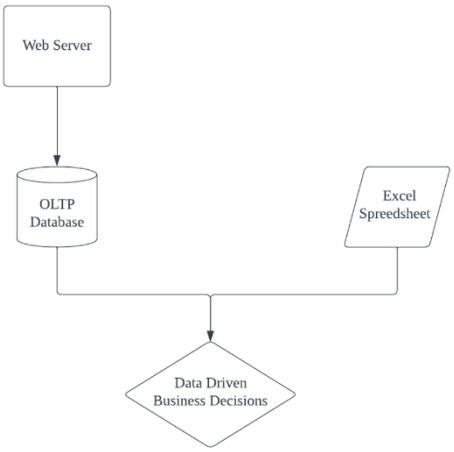
Project Scope and Planning Document

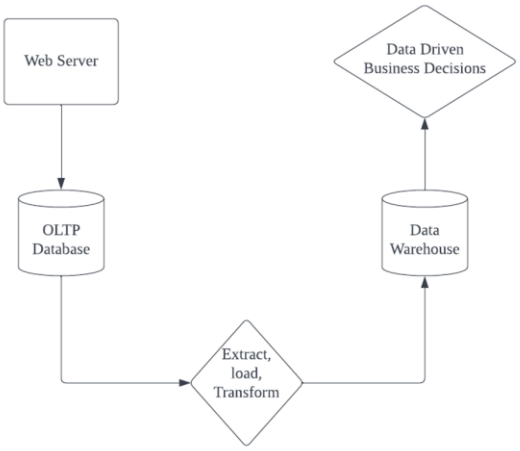
Executive Summary

We used to be a Traditional Educational company. The business was fine until recently the Covid hit; our business took a big fall. We decided to slowly transform it into an Online Learning Platform company. Our business model would be similar to Other Online learning Platforms such as Coursera, Udemy, and Udacity. Our company has 25 employees working in four departments, which are sales, marketing, financial, and product. However, our business has run into some problems along the line. I will provide our business overview below and the business problems that we are facing.

We are currently using an Excel spreadsheet to track all students' data, we also have an OLTP database that's being managed by a third-party company which is for powering our Online Learning Platform. The OLTP only contains the current student's information and some class contents. Our model shows as below:



We ran into some major problems with this model. The first one is that it's hard for us to scale our business and expand our customers since we don't have a central database. It's hard for our data analysis to perform deep analysis on our customers in order to better market our content. Second, it's hard for us to track our payment. Our current payment method is that customers will directly transfer payment to our business account through a bank or Alipay. We are hoping to switch to an online subscription model. We wish to transform our business into:



By developing an RDBMS, we wish to solve two major problems.

- The database should be about to track all students' information, including past, current students.
- The database should be able to track all payment invoices.

Project Objectives

We aim to develop RDBMS system for our Online Learning Platform company within 5.5 months. This will give get us a deeper data analysis and an efficient online subscription model.

Project scope

The project required an analysis of the existing system and a detailed system design proposal. The new database needs to collect all customer information and access the user's payment information. After the new system is designed, team members need to test the system and provide users with instructions. In addition, the project requires regular maintenance and updates to accommodate different operating systems.

The project's resources included old spreadsheet information, an OLTP database, and 25 employees from different departments.

Product scope

The final product is a new version of the software containing the RDBMS database. Both users and internal company members will operate the program online.
Other deliverables include detailed plans for each phase, product testing reports, user manuals, and final project reports.

Business Case

The education industry has always been an important concern of society, which can cultivate talents for the future, create scientific knowledge and material wealth for the society, promote economic growth, and promote world peace and human development, so it must maintain high coverage, sustainable innovation, and good adaptability. We were a traditional educational company that only provided offline education for students. In 2020, the sudden pandemic broke the traditional education method, and the offline education model was difficult to operate. However, with the development of information technology such as 5G, AI, etc., the rapid rise of the teaching model from offline to online has brought new changes to the education industry. Online teaching is more flexible in time and space, which can provide high area coverage of education and track students' learning comprehensively, then teachers can conduct targeted teaching guidance. So, we have to adapt to changes in the market and seize the opportunity to transform our business model.

Everything will be moved to remote, the old operation mode does not work anymore, so a new online database management system is the primary need for us to better manage and store different kinds of information. After we shift our business online, there are hundreds of students who need to sign up for their courses through the online platform, and probably they will sign up for more than one class of different subjects. Such a large amount of information needs to be stored reasonably and logically in the database so that staff can be convenient and effective to look up or deal with customers' requests or problems. If some potential students want to join classes, we also can collect their information and store it in our database system that we can easily push promotion activities or new course to them to expand our customer group. Regardless of current students, past students, or potential students, their related information would be stored in well-order for analysis or reference. Besides, payment is another big problem

that needs the facilitation of the database system. Student needs to pay tuition, book and supplies fee, or other expenses online, so a comprehensive system can record all the transactions including payments and refund which can help us monitor our financial status.

Actually, the database can help achieve data share in real-time, so staff can look up and add or delete information in any place and any time as long as there is an internet and reduce data redundancy. The centralized control of the database can ensure data consistency and reliability. Also, the customers' information can be used to analyze based on regions, age, study subjects, class frequency, etc to find market commonalities to conduct more targeted and precise marketing and refine courses to increase the probability of user retention and our profitability.

Our expected database solution is to collect and store students' information in the CURRENT_STUDENT table as they sign up for courses. As they sign up successfully, they can have their own account to record their courses information including subject, session, schedule, and so on. On the finish day of a semester, the data in the CURRENT_STUDENT table will be added to the PAST_STUDENT table, and the CURRENT_STUDENT table will be emptied. If a current student will enroll in courses for next semester, his information will appear in the CURRENT_STUDENT table again and be deleted automatically in the PAST_STUDENT table. Therefore, the information of one student will only appear in one table. If some potential customers are interested in our courses, they also can leave their contact information which will be recorded in the POTENTIAL_STUDENT table which is used for labeling their interests and pushing related messages to develop them to current customers. Besides, the payment details will be included in student accounts. After students paid their bills, the system will send invoices to them automatically, then the transaction information will be stored in the REVENUE table. With the new database system, our company can make better decisions and achieve our expected goals. The system can simplify business processes, improve the inefficient human resources system, and save time and cost on the operation. The key thing is the database system is helpful for us to begin the new online business model and seek more new opportunities.

Assumptions and Constraints

Assumptions are all possible and most ideal conditions we expect to see when we are running the project.

<u>Assumptions:</u>

1. All the resources (funds, materials, staff, etc.) are of great quality, sufficient, and allocated correctly based on the scale of each phase during the entire project life cycle.
2. All the project-related members are experienced, professional, and work efficiently, finishing tasks on time.
3. All the resources are available to use when they are needed.
4. Problems, no matter in business or in technical aspects, are found and solved timely to avoid losses of money and time.
5. Wages, operation price, and resources spendings stay constant throughout the project life cycle.
6. The actual spending would not exceed the budget.
7. The time schedule can be achieved.
8. The database meets the requirements of stakeholders and the needs of users(students).
9. The network condition where the project was conducted is great and smooth.

10. Changing weather would not negatively impact the hardware and the progress of the projects.
11. Have alternative plans to deal with emergencies, such as the lack of resources, sudden members quitting, etc.

Constraints are fixed limitations on our project.

Constraints:

1. Advertising time is limited to every day from 5 to 9 p.m.
2. Budget is only enough for three years until getting funded by investors.
3. The level of competition from other companies in the industry is considered to be high.
4. Staff training time is limited to one week per staff.

Project Team:

- Felix Huang: Project Manager
- Grace Li: Database Analyst
- Jiaxuan Wang: Database Security Officer
- Zhiwei Liang: Database Consultant
- Peilin Li: Database Designer
- Jay Jiang: Data administrator

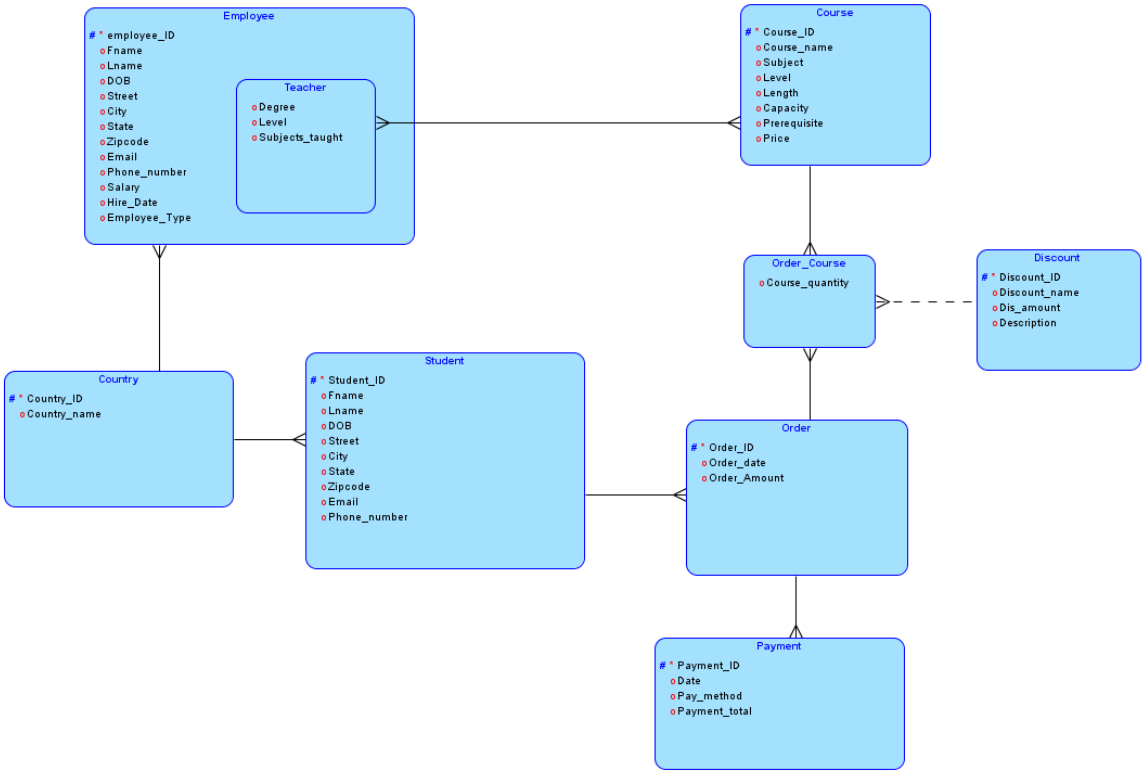
Major Deliverable, due dates, and acceptance criteria

No.	Content	Major Deliverable	Time Length	Criteria
1	Planning		0.5 Month	
1.1	Initial Assessment	High-level Project Plan (all stages)	3 days	
1.2	Demand Analysis	Demand Analysis Stage Detailed Work Plan	1 week	Accurate to business's short-term and long-term success
1.3	Confirmation	Project and Regulartion Management Manual	2 days	Get approval from client and manager
2	Analysis		1 Month	
2.1	User Requirement	Flow Diagram	2 weeks	Step by step approachto solving the task
		Functional Needs Illustration		Detailed illustrate the client's requirement
2.2	Study of Existing System	Existing System Review	1 week	
2.3	Logical System Design	Entity Relationship Diagram	1 week	It includes data requirement and graphical notation for new system.
3	Detailed Systems Design		1 Month	
3.1	System Design	Database Design Instruction	1.5 weeks	
		Interface Design Specification		
3.2	User Specification Design	Application System Operation Manual	1 week	
3.3	Development Management	Data File Control Process	1.5 weeks	To define the way of manipulating data to maintain data accuracy and integrity.
		Problem Report Process		
4	Implementation		2 Month	
4.1	Software Implementation	New Version Software	1 month	
		Detailed Design Instruction		
4.2	Test	Unit Test Report	3 weeks	Reports will include the description of objective, functions in scope and out of scope for testing,metrics of results. It should also provide details ion test environment
		System Test Report		
		Test Problem List		
4.3	User Manual	Operation Manual	1 week	
		Technology Manual		
5	Maintenance		1 Month	
5.1	System Maintenance	System Maintenance Logs	3.5 weeks	The company will create a job position for maintenance. Every updating should be reported in forms
		Modified Software Version		
5.2	Close	Project Report	0.5 week	

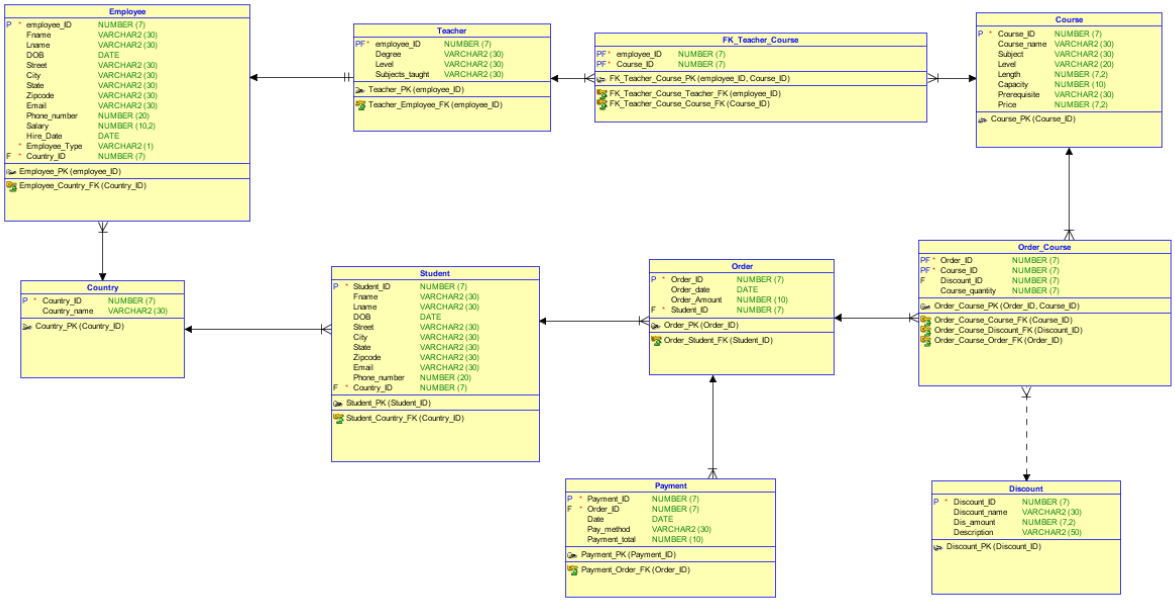
Who worked on which part(s) of the project?

Executive Summary: Felix Huang
Project Objectives: Grace Li
Project scope: Grace Li
Product scope: Grace Li
Business Case: Zhiwei Liang
Assumptions: Peilin Li
Constraints: Jiaxuan Wang
Major Deliverable, due dates, and acceptance criteria: Jay Jiang

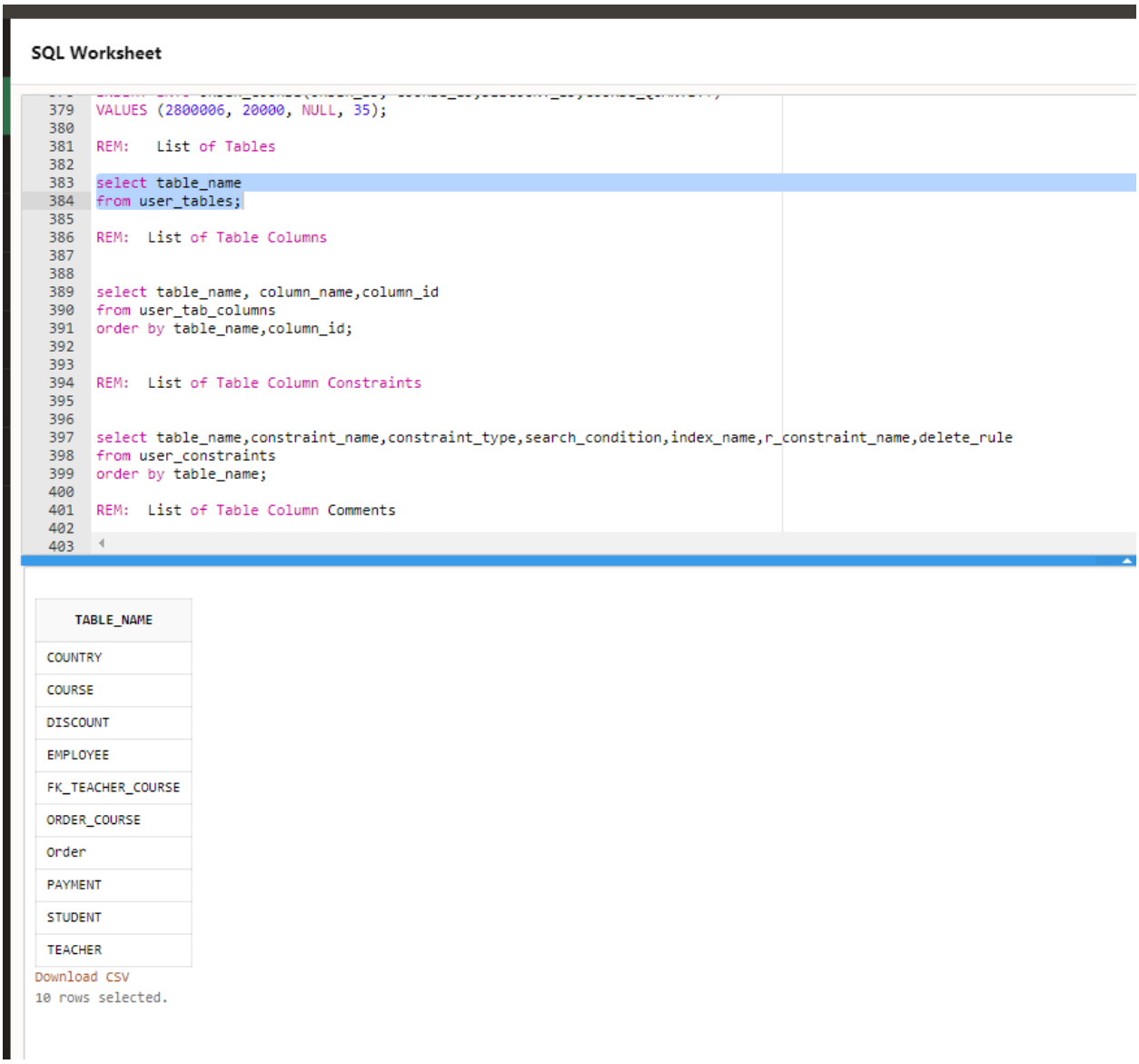
Logical Model



Relational Model



Data Dictionary Queries Result Screenshots



SQL Worksheet

```
387
388
389 select table_name, column_name,column_id
390 from user_tab_columns
391 order by table_name,column_id;
```

TABLE_NAME	COLUMN_NAME	COLUMN_ID
COUNTRY	COUNTRY_ID	1
COUNTRY	COUNTRY_NAME	2
COURSE	COURSE_ID	1
COURSE	COURSE_NAME	2
COURSE	SUBJECT	3
COURSE	Level	4
COURSE	LENGTH	5
COURSE	CAPACITY	6
COURSE	PREREQUISITE	7
COURSE	PRICE	8
DISCOUNT	DISCOUNT_ID	1
DISCOUNT	DISCOUNT_NAME	2
DISCOUNT	DIS_AMOUNT	3
DISCOUNT	DESCRIPTION	4
EMPLOYEE	EMPLOYEE_ID	1
EMPLOYEE	FNAME	2
EMPLOYEE	LNAME	3
EMPLOYEE	DOB	4
EMPLOYEE	STREET	5
EMPLOYEE	CITY	6
EMPLOYEE	STATE	7
EMPLOYEE	ZIPCODE	8
EMPLOYEE	EMAIL	9
EMPLOYEE	PHONE_NUMBER	10
EMPLOYEE	SALARY	11
EMPLOYEE	HIRE_DATE	12
EMPLOYEE	EMPLOYEE_TYPE	13

SQL Worksheet

```
387
388
389 select table_name, column_name,column_id
390 from user_tab_columns
391 order by table_name,column_id;
```

EMPLOYEE	SALARY	11
EMPLOYEE	HIRE_DATE	12
EMPLOYEE	EMPLOYEE_TYPE	13
EMPLOYEE	COUNTRY_ID	14
FK_TEACHER_COURSE	EMPLOYEE_ID	1
FK_TEACHER_COURSE	COURSE_ID	2
ORDER_COURSE	ORDER_ID	1
ORDER_COURSE	COURSE_ID	2
ORDER_COURSE	DISCOUNT_ID	3
ORDER_COURSE	COURSE_QUANTITY	4
Order	ORDER_ID	1
Order	ORDER_DATE	2
Order	ORDER_AMOUNT	3
Order	STUDENT_ID	4
PAYMENT	PAYMENT_ID	1
PAYMENT	ORDER_ID	2
PAYMENT	Date	3
PAYMENT	PAY_METHOD	4
PAYMENT	PAYMENT_TOTAL	5
STUDENT	STUDENT_ID	1
STUDENT	FNAME	2
STUDENT	LNAME	3
STUDENT	DOB	4
STUDENT	STREET	5
STUDENT	CITY	6
STUDENT	STATE	7

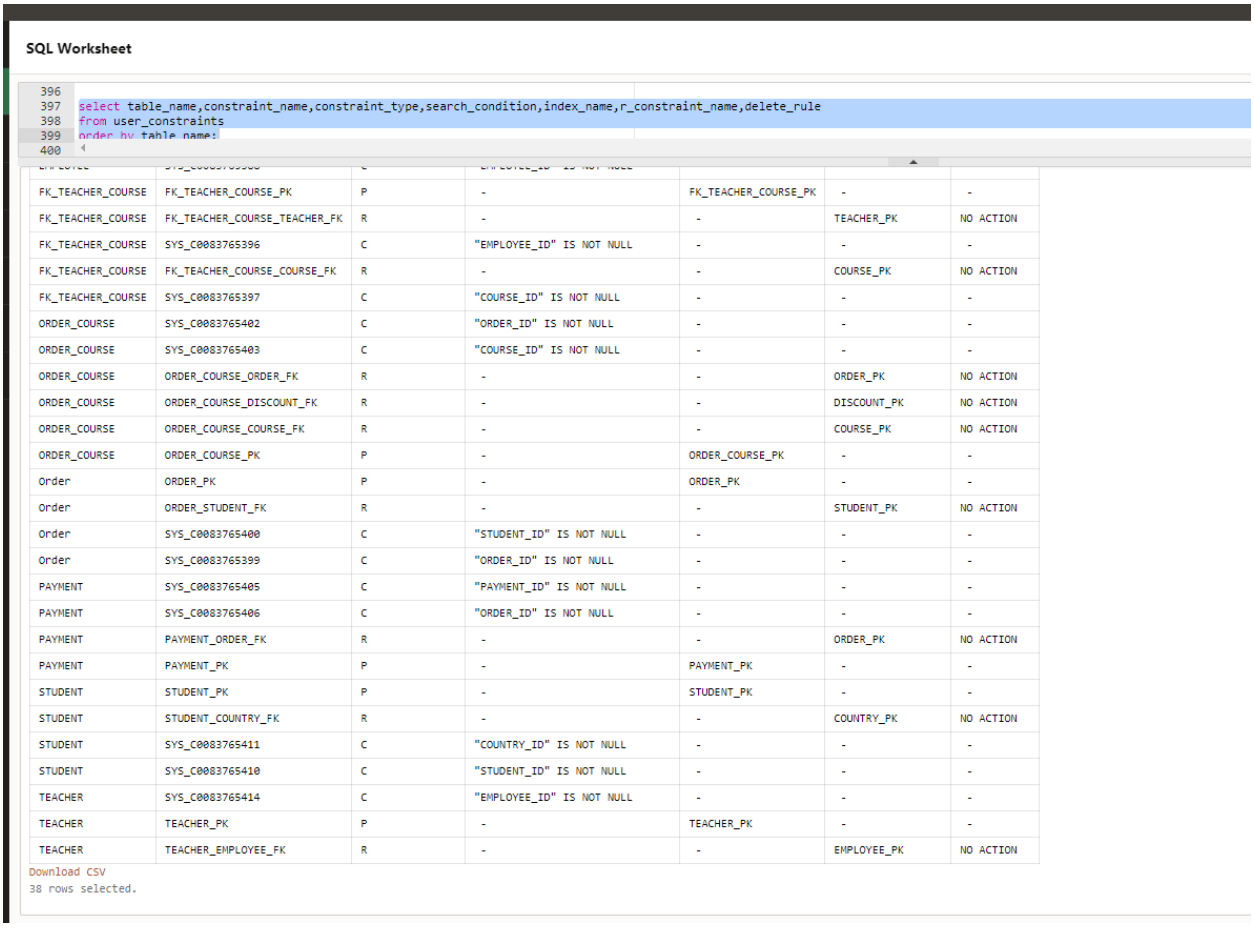
Download CSV

Rows 1 - 50. More rows exist.

SQL Worksheet

```
396
397 select table_name,constraint_name,constraint_type,search_condition,index_name,r_constraint_name,delete_rule
398 from user_constraints
399 order by table_name;
400
```

TABLE_NAME	CONSTRAINT_NAME	CONSTRAINT_TYPE	SEARCH_CONDITION	INDEX_NAME	R_CONSTRAINT_NAME	DELETE_RULE
COUNTRY	SYS_C0083765380	C	"COUNTRY_ID" IS NOT NULL	-	-	-
COUNTRY	COUNTRY_PK	P	-	COUNTRY_PK	-	-
COURSE	SYS_C0083765382	C	"COURSE_ID" IS NOT NULL	-	-	-
COURSE	COURSE_PK	P	-	COURSE_PK	-	-
DISCOUNT	DISCOUNT_PK	P	-	DISCOUNT_PK	-	-
DISCOUNT	SYS_C0083765385	C	"DISCOUNT_ID" IS NOT NULL	-	-	-
EMPLOYEE	SYS_C0083765389	C	"EMPLOYEE_TYPE" IS NOT NULL	-	-	-
EMPLOYEE	EMPLOYEE_PK	P	-	EMPLOYEE_PK	-	-
EMPLOYEE	SYS_C0083765390	C	"COUNTRY_ID" IS NOT NULL	-	-	-
EMPLOYEE	EMPLOYEE_COUNTRY_FK	R	-	-	COUNTRY_PK	NO ACTION
EMPLOYEE	CH_INH_EMPLOYEE	C	employee_type IN ('O', 'T')	-	-	-
EMPLOYEE	SYS_C0083765388	C	"EMPLOYEE_ID" IS NOT NULL	-	-	-
FK_TEACHER_COURSE	FK_TEACHER_COURSE_PK	P	-	FK_TEACHER_COURSE_PK	-	-
FK_TEACHER_COURSE	FK_TEACHER_COURSE_TEACHER_FK	R	-	-	TEACHER_PK	NO ACTION
FK_TEACHER_COURSE	SYS_C0083765396	C	"EMPLOYEE_ID" IS NOT NULL	-	-	-
FK_TEACHER_COURSE	FK_TEACHER_COURSE_COURSE_FK	R	-	-	COURSE_PK	NO ACTION
FK_TEACHER_COURSE	SYS_C0083765397	C	"COURSE_ID" IS NOT NULL	-	-	-
ORDER_COURSE	SYS_C0083765402	C	"ORDER_ID" IS NOT NULL	-	-	-
ORDER_COURSE	SYS_C0083765403	C	"COURSE_ID" IS NOT NULL	-	-	-
ORDER_COURSE	ORDER_COURSE_ORDER_FK	R	-	-	ORDER_PK	NO ACTION
ORDER_COURSE	ORDER_COURSE_DISCOUNT_FK	R	-	-	DISCOUNT_PK	NO ACTION
ORDER_COURSE	ORDER_COURSE_COURSE_FK	R	-	-	COURSE_PK	NO ACTION
ORDER_COURSE	ORDER_COURSE_PK	P	-	ORDER_COURSE_PK	-	-
Order	ORDER_PK	P	-	ORDER_PK	-	-
Order	ORDER_STUDENT_FK	R	-	-	STUDENT_PK	NO ACTION
Order	SYS_C0083765400	C	"STUDENT_ID" IS NOT NULL	-	-	-



SQL Worksheet

```
396
397 select table_name,constraint_name,constraint_type,search_condition,index_name,r_constraint_name,delete_rule
398 from user_constraints
399 order by table_name;
400
```

FK_TEACHER_COURSE	FK_TEACHER_COURSE_PK	P	-	FK_TEACHER_COURSE_PK	-	-
FK_TEACHER_COURSE	FK_TEACHER_COURSE_TEACHER_FK	R	-	-	TEACHER_PK	NO ACTION
FK_TEACHER_COURSE	SYS_C0083765396	C	"EMPLOYEE_ID" IS NOT NULL	-	-	-
FK_TEACHER_COURSE	FK_TEACHER_COURSE_COURSE_FK	R	-	-	COURSE_PK	NO ACTION
FK_TEACHER_COURSE	SYS_C0083765397	C	"COURSE_ID" IS NOT NULL	-	-	-
ORDER_COURSE	SYS_C0083765402	C	"ORDER_ID" IS NOT NULL	-	-	-
ORDER_COURSE	SYS_C0083765403	C	"COURSE_ID" IS NOT NULL	-	-	-
ORDER_COURSE	ORDER_COURSE_ORDER_FK	R	-	-	ORDER_PK	NO ACTION
ORDER_COURSE	ORDER_COURSE_DISCOUNT_FK	R	-	-	DISCOUNT_PK	NO ACTION
ORDER_COURSE	ORDER_COURSE_COURSE_FK	R	-	-	COURSE_PK	NO ACTION
ORDER_COURSE	ORDER_COURSE_PK	P	-	ORDER_COURSE_PK	-	-
Order	ORDER_PK	P	-	ORDER_PK	-	-
Order	ORDER_STUDENT_FK	R	-	-	STUDENT_PK	NO ACTION
Order	SYS_C0083765400	C	"STUDENT_ID" IS NOT NULL	-	-	-
Order	SYS_C0083765399	C	"ORDER_ID" IS NOT NULL	-	-	-
PAYMENT	SYS_C0083765405	C	"PAYMENT_ID" IS NOT NULL	-	-	-
PAYMENT	SYS_C0083765406	C	"ORDER_ID" IS NOT NULL	-	-	-
PAYMENT	PAYMENT_ORDER_FK	R	-	-	ORDER_PK	NO ACTION
PAYMENT	PAYMENT_PK	P	-	PAYMENT_PK	-	-
STUDENT	STUDENT_PK	P	-	STUDENT_PK	-	-
STUDENT	STUDENT_COUNTRY_FK	R	-	-	COUNTRY_PK	NO ACTION
STUDENT	SYS_C0083765411	C	"COUNTRY_ID" IS NOT NULL	-	-	-
STUDENT	SYS_C0083765410	C	"STUDENT_ID" IS NOT NULL	-	-	-
TEACHER	SYS_C0083765414	C	"EMPLOYEE_ID" IS NOT NULL	-	-	-
TEACHER	TEACHER_PK	P	-	TEACHER_PK	-	-
TEACHER	TEACHER_EMPLOYEE_FK	R	-	-	EMPLOYEE_PK	NO ACTION

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38 rows selected.

SQL Worksheet

```
403
404 select table_name,column_name,comments
405 from user_col_comments
406 order by table_name;
```

TABLE_NAME	COLUMN_NAME	COMMENTS
COUNTRY	COUNTRY_ID	Country ID
COUNTRY	COUNTRY_NAME	The name of the country
COURSE	PRICE	Course price
COURSE	Level	Level of the subject. For example, Level A in English
COURSE	LENGTH	Length of the class in minute
COURSE	CAPACITY	Max capacity of students in the class
COURSE	PREREQUISITE	Prerequisite for taking the class
COURSE	COURSE_NAME	course name
COURSE	COURSE_ID	Course ID
COURSE	SUBJECT	Subject of the class. For example, English, Math
DISCOUNT	DIS_AMOUNT	Discount amount means the precentage of discount. For example, 0.3 means that 30% off.
DISCOUNT	DISCOUNT_NAME	name of the discount
DISCOUNT	DISCOUNT_ID	Discount ID
DISCOUNT	DESCRIPTION	Description of discount
EMPLOYEE	EMPLOYEE_ID	Employee ID
EMPLOYEE	FNAME	First name of employee
EMPLOYEE	LNAME	Last name of Employee
EMPLOYEE	DOB	Date of Birth of employee
EMPLOYEE	STREET	Address street of employee
EMPLOYEE	CITY	City of Address of employee
EMPLOYEE	COUNTRY_ID	-
EMPLOYEE	ZIPCODE	ZipCode of employee's address
EMPLOYEE	EMAIL	Employee Email address
EMPLOYEE	PHONE_NUMBER	Employee phone number
EMPLOYEE	SALARY	Employee's salary
EMPLOYEE	HIRE_DATE	Date of Hired

SQL Worksheet

```
403
404 select table_name,column_name,comments
405 from user_col_comments
406 order by table_name;
```

EMPLOYEE	SALARY	Employee's salary
EMPLOYEE	HIRE_DATE	Date of Hired
EMPLOYEE	EMPLOYEE_TYPE	Type of employee. Could have instructor and other employee types.
EMPLOYEE	STATE	State of address of employee
FK_TEACHER_COURSE	EMPLOYEE_ID	-
FK_TEACHER_COURSE	COURSE_ID	-
ORDER_COURSE	COURSE_ID	-
ORDER_COURSE	ORDER_ID	-
ORDER_COURSE	DISCOUNT_ID	-
ORDER_COURSE	COURSE_QUANTITY	number of class customers want to order
Order	ORDER_DATE	Date and time of order
Order	ORDER_ID	Order ID
Order	ORDER_AMOUNT	Amount of money in the order. (USD)
Order	STUDENT_ID	-
PAYMENT	PAYMENT_ID	Unique Payment ID
PAYMENT	ORDER_ID	-
PAYMENT	Date	Date and time of invoice created
PAYMENT	PAY_METHOD	Payment method
PAYMENT	PAYMENT_TOTAL	Total amount of payment
STUDENT	STUDENT_ID	Student ID
STUDENT	COUNTRY_ID	-
STUDENT	PHONE_NUMBER	Student phone number
STUDENT	EMAIL	Student's Email
STUDENT	FNAME	First name of student
STUDENT	LNAME	Last name of student
STUDENT	DOB	Date of birth

Download CSV

Rows 1 - 50. More rows exist.

Total Number of Records for Each of Tables and All Populated Data for Each Tables

```
select table_name,
       to_number(extractvalue(xmltype(dbms_xmlgen.getxml('select count(*) c from '||owner||'."'||table_name ||'"')),'/ROWSET/ROW/C'))
       as count
from all_tables
where owner = 'SQL_XCDJAHHIFMZEJCSAONXGMFSJA'
```

TABLE_NAME	COUNT
COUNTRY	8
COURSE	13
DISCOUNT	10
EMPLOYEE	16
FK_TEACHER_COURSE	13
ORDER_COURSE	15
Order	15
PAYMENT	15
STUDENT	15
TEACHER	13

Download CSV
10 rows selected.

SQL Worksheet

```
SELECT  *  FROM STUDENT
```

STUDENT_ID	FNAME	LNAME	DOB	STREET	CITY	STATE	ZIPCODE	EMAIL	PHONE_NUMBER	COUNTRY_ID
1	STEVE	ROGGERS	31-DEC-93	101 MAIN ST	BOSTON	MA	02129	SROGGERS@GMAIL.COM	2023214455	1
2	JIANG	LI	13-OCT-96	81 STREET	SUZHOU	JIANGSU	215000	JIANGLI@GMAIL.COM	15502003333	86
3	JOAN	MIRO	25-SEP-97	35 LOWER MARSH	LONDON	-	5208	JOANM97@GMAIL.COM	2055891145	44
4	ALLIE	GRATER	15-DEC-96	43 3RD ST	NEW YORK	NY	10007	ALGRATER@GMAIL.COM	9293216635	1
5	KARAN	NIGAM	16-JAN-97	5 TEMPLE TANK ROAD	DELHI	DELHI	110014	KNIGAM@GMAIL.COM	24376836	91
6	RYAN	MARWAH	09-OCT-97	JI WR SUPRATMAN	JEMBER	PROBOLINGGO	68137	RYANMA9@GMAIL.COM	331489584	62
7	ZULAIKHA	SARIM	11-AUG-95	1039 TAMAN CITY	KUALA LUMPUR	MALAYSIA	51200	ZULAIKHAS@GMAIL.COM	362583570	60
8	YONGBIN	LAI	01-NOV-94	357D HOLLAND ROAD	SINGAPORE	-	278634	YONGBINL1@GMAIL.COM	64666137	65
9	KUBA	KAYO	18-MAR-96	5-1, SUSUGAYA	HIRAKAWA	AOMORI	-	KAYO1803@GMAIL.COM	2187208031	81
10	CHRIS	RATKE	06-JUN-97	405 HIGHWOOD CIR	JUPITER	FL	33458	CHRISK06@GMAIL.COM	5612228250	1
11	VITA	TOWNE	07-JUL-97	3701 KIRBY DR	HOUSTON	TX	77098	VITAT08@GMAIL.COM	8326544595	1
12	CHRISTELLE	RIPPIN	19-MAY-96	74999 FRANK ST	PALM DESERT	CA	92211	CHRISTELLE19@GMAIL.COM	7603465722	1
13	KIRK	BACH	20-MAY-97	2131 LAS PALMAS DR	CARISBAD	CA	92011	BACH52097@GMAIL.COM	6194446568	1
14	TYREE	ZULUF	10-SEP-97	3712 MAIN ST	CHUTA VISTA	CA	91911	TYREE0910@GMAIL.COM	6194252040	1
15	SANTIAGO	BARTELL	20-DEC-97	1250 I ST NW	WASHINGTON	DE	20005	SANTIAGO20@GMAIL.COM	2028980555	1

Download CSV
15 rows selected.

SQL Worksheet

```
1  SELECT  *  FROM COUNTRY
```

COUNTRY_ID	COUNTRY_NAME
86	CHINA
1	UNITED STATES
91	INDIA
62	INDONESIA
60	MALAYSIA
65	SINGAPORE
44	UNITED KINGDOM
81	JAPAN

Download CSV

8 rows selected.

```
1  SELECT  *  FROM EMPLOYEE
```

EMPLOYEE_ID	FNAME	LNAME	DOB	STREET	CITY	STATE	ZIPCODE	EMAIL	PHONE_NUMBER	SALARY	HIRE_DATE	EMPLOYEE_TYPE	COUNTRY_ID
1000001	STEVE	RICKEY	10-JAN-80	4467 POWDER HOUSE ROAD	DELRAY BEACH	FL	33484	STEVER01@GMAIL.COM	5917102067	4500	01-JAN-16	T	1
1000002	DARRYL	RUSS	10-MAY-81	3925 HEATHER SEES WAY	NASHOBA	OK	74558	DARRYLR05@GMAIL.COM	4414456783	4500	01-SEP-16	T	1
1000003	MARIA	BELL	11-JUL-79	1403 PETUNIA WAY	BIRMINGHAM	AL	35209	MARIABELL07@GMAIL.COM	4245056907	5000	01-JAN-15	T	1
1000004	NIJIYA	YAMAMURA	16-OCT-82	452-1119 TAKAGAWARA	ISHII-CHO	TOKUSHIMA	-	NIJIYA16@GMAIL.COM	498587149	3500	01-SEP-21	T	81
1000005	ALBERT	HUDSON	10-OCT-80	1003 BRENTWOOD DRIVE	COUPLAND	TX	78615	ALBERTH10@GMAIL.COM	4663615746	4500	01-JAN-16	T	1
1000006	TAO	TIEN	17-OCT-90	644 FENGYANG ROAD	JIANGAN	SHANGHAI	200023	TAOTIEN1017@GMAIL.COM	13073352797	3500	01-SEP-21	T	86
1000007	VIR	TRIKHA	13-MAY-79	1005, A WING, MITTAL TOWERS	BANGALORE	KARNATAKA	560001	VIRTRIKHA13@GMAIL.COM	8025582470	4500	01-JAN-16	T	91
1000008	RUILIN	HE	22-OCT-80	200 UPPER THOMSON ROAD	SINGAPORE	-	574424	RUILINHE22@GMAIL.COM	62568145	4500	01-JAN-16	T	65
1000009	SIMON	CHAPMAN	10-JAN-80	95 OVERTON CIRCLE	LITTLE WELNETHAM	-	IP30 7HH	SIMONCHAP10@GMAIL.COM	7878537202	4500	01-JAN-16	T	44
1000010	DONALD	COLLINS	18-SEP-75	2562 ARMBRESTER DRIVE	CULVER CITY	CA	90232	DONALDC18@GMAIL.COM	6144631983	5000	01-JAN-15	T	1
1000011	LINSEY	FINDLAY	30-JUL-72	2722 TEA BERRY LANE	WAUSAU	WI	54403	LINSEYF30@GMAIL.COM	3885490812	6000	01-JAN-15	T	1
1000012	DOUGLAS	ROBINSON	27-FEB-70	3617 HEAVNER AVENUE	MARIETTA	GA	30064	DOUGLASR27@GMAIL.COM	6702497100	6000	01-JAN-15	T	1
1000013	NORMA	GILL	06-APR-79	3997 BEN STREET	NORTH CREEK	NY	12853	NORMAG06@GMAIL.COM	5182510782	5500	01-SEP-16	T	1
1000014	BOBBY	WEST	07-APR-76	1223 WOODSTOCK DRIVE	EL MONTE	CA	91731	BOBBYW07@GMAIL.COM	6265795209	5500	01-SEP-16	O	1
1000015	MAYZE	SCHIAVONE	29-AUG-77	4952 WOLF PEN ROAD	BURLINGAME	CA	94010	MAYZES29@GMAIL.COM	6503403753	5000	01-SEP-18	O	1
1000016	SUE	DAWSON	10-AUG-85	1889 CAYNOR CIRCLE	RED BANK	NJ	07701	SUEDAWSON10@GMAIL.COM	9085835639	4000	01-JAN-20	O	1

Download CSV

16 rows selected.

SQL Worksheet

```
1  SELECT  *  FROM TEACHER
```

EMPLOYEE_ID	DEGREE	Level	SUBJECTS_TAUGHT
1000001	PHD	S	Project Management
1000002	Master	A	Management in Global Economy
1000003	PHD	S	Strategic Management
1000004	PHD	A	Molecular Systems
1000005	PHD	S	Protein Biochemistry
1000006	PHD	A	Intro to Electron Microscopy
1000007	PHD	A	Intro to Data Science
1000008	PHD	A	Mathematical Statistics
1000009	PHD	S	Database Systems
1000010	PHD	SS	Practical Training for DA
1000011	PHD	A	Intro to Musicology
1000012	PHD	A	Sem/Tech of Music Compos
1000013	PHD	S	Reading & Research

Download CSV

13 rows selected.

SQL Worksheet

```
1  SELECT  *  FROM PAYMENT
```

PAYMENT_ID	ORDER_ID	Date	PAY_METHOD	PAYMENT_TOTAL
2900001	2800001	30-JUN-21	CREDIT CARD	1900
2900002	2800002	02-JUL-21	E-CHECK	2850
2900003	2800003	05-JUL-21	CREDIT CARD	2850
2900004	2800004	09-JUL-21	DEBIT CARD	3800
2900005	2800005	14-JUL-21	E-CHECK	4750
2900006	2800006	20-JUL-21	E-CHECK	3800
2900007	2800007	23-JUL-21	DEBIT CARD	1900
2900008	2800008	24-JUL-21	DEBIT CARD	950
2900009	2800009	29-JUL-21	E-CHECK	1900
2900010	2800010	03-AUG-21	E-CHECK	3800
2900011	2800011	06-AUG-21	DEBIT CARD	4750
2900012	2800012	15-AUG-21	E-CHECK	5700
2900013	2800013	21-AUG-21	CREDIT CARD	1900
2900014	2800014	25-AUG-21	CREDIT CARD	950
2900015	2800015	25-AUG-21	DEBIT CARD	3800

Download CSV

15 rows selected.

SQL Worksheet

```
1  SELECT  *  FROM ORDER_COURSE
```

ORDER_ID	COURSE_ID	DISCOUNT_ID	COURSE_QUANTITY
2800001	10000	202106	20
2800002	10001	202106	18
2800003	10002	202106	27
2800004	20000	202106	40
2800005	20001	202106	38
2800015	40002	-	30
2800014	40001	-	20
2800013	40000	-	15
2800012	30003	-	20
2800011	30002	-	25
2800010	30001	-	18
2800009	30000	-	15
2800008	20002	-	45
2800007	20001	-	30
2800006	20000	-	35

Download CSV

15 rows selected.

SQL Worksheet

Clear Find Acti

```
1  SELECT  *  FROM COURSE
```

COURSE_ID	COURSE_NAME	SUBJECT	Level	LENGTH	CAPACITY	PREREQUISITE	PRICE
10000	Project Management	Management	S	150	30	Management in Global Economy	1250
10001	Management in Global Economy	Management	A	120	50	-	1000
10002	Strategic Management	Management	S	150	30	Management in Global Economy	1250
20000	Molecular Systems	Biology	A	120	70	-	1000
20001	Protein Biochemistry	Biology	S	150	55	Molecular Systems	1250
20002	Intro to Electron Microscopy	Biology	A	150	25	-	1300
30000	Intro to Data Science	Data Science	A	120	80	-	1000
30001	Mathematical Statistics	Data Science	A	120	80	-	1000
30002	Database Systems	Data Science	S	150	50	Intro to Data Science	1250
30003	Practical Training for DA	Data Science	SS	150	30	Database Systems	1300
40000	Intro to Musicology	Music	A	120	50	-	900
40001	Sem/Tech of Music Compos	Music	A	150	30	Intro to Musicology	1000
40002	Reading & Research	Music	S	150	30	Intro to Musicology	1100

Download CSV

13 rows selected.

SQL Worksheet

```
1  SELECT  *  FROM DISCOUNT
```

DISCOUNT_ID	DISCOUNT_NAME	DIS_AMOUNT	DESCRIPTION
202112	CHRISTMAS	.8	FESTIVAL DISCOUNT
202111	THANKSGIVING	.75	FESTIVAL DISCOUNT
202110	TEACHERSDAY	.9	FESTIVAL DISCOUNT
202109	BACKTOSCHOOL	.8	NEW SEMESTER DISCOUNT
202101	HAPPYNEWYEAR	.8	FESTIVAL DISCOUNT
202102	LOVE	.9	FESTIVAL DISCOUNT
202103	LITTLERABBIT	.95	FESTIVAL DISCOUNT
202104	QINGMING	.9	FESTIVAL DISCOUNT
202105	LABORSDAY	.9	FESTIVAL DISCOUNT
202106	SUMMERHOLIDAY	.8	VACATION DISCOUNT

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10 rows selected.

SQL Worksheet

```
1  SELECT  *  FROM "Order"
```

ORDER_ID	ORDER_DATE	ORDER_AMOUNT	STUDENT_ID
2800001	30-JUN-21	1900	1
2800002	02-JUL-21	2850	2
2800003	05-JUL-21	2850	3
2800004	09-JUL-21	3800	4
2800005	14-JUL-21	4750	5
2800006	20-JUL-21	3800	6
2800007	23-JUL-21	1900	7
2800008	24-JUL-21	950	8
2800009	29-JUL-21	1900	9
2800010	03-AUG-21	3800	10
2800011	06-AUG-21	4750	11
2800012	15-AUG-21	5700	12
2800013	21-AUG-21	1900	13
2800014	25-AUG-21	950	14
2800015	25-AUG-21	3800	15

Download CSV

15 rows selected.

Work Distribution

Part a, b, c:
Felix Huang

Part d:
Borui Li: Country, Student, Employee
Jay Jiang: Teacher, Course
Zhiwei Liang: Order, Payment
Jiaxuan Wang&Peilin Li: Order_Course, Discount

Part e, f:
Jiaxuan Wang, Peilin Li

Screenshots of Five Queries

Part 1 Two queries using sub-queries

1) Statement:

The purpose of using this sub-query is to give teachers a raise who has a PhD degree in our company. Experienced teachers can attract more students to choose our institute. This is to show our higher-level teachers our appreciation and acknowledge their accomplishments. The salary raise for the employees who has a PhD degree is because we want to reward them for their knowledge, hard work, loyalty, and also they know the most about our teaching content and can pass on their valuable experience and knowledge to others. Also, we can attract more higher-level teachers to choose to work for our company with a higher salary.

2) SQL Query:

```
UPDATE EMPLOYEE
SET SALARY= SALARY * 1.25
WHERE 'PHD' IN (SELECT DEGREE FROM TEACHER WHERE
TEACHER.EMPLOYEE_ID = EMPLOYEE.EMPLOYEE_ID);
```

3) Screenshot of result from SQL query

Before the update:

```
381  SELECT * FROM EMPLOYEE
```

EMPLOYEE_ID	FNAME	LNAME	DOB	STREET	CITY	STATE	ZIPCODE	EMAIL	PHONE_NUMBER	SALARY	HIRE_DATE	EMPLOYEE_TYPE	COUNTRY_ID
1000001	STEVE	RICKEY	10-JAN-80	4467 POWDER HOUSE ROAD	DELRAY BEACH	FL	33484	STEVER01@GMAIL.COM	5917102067	4500	01-JAN-16	T	1
1000002	DARRYL	RUSS	10-MAY-81	3925 HEATHER SEES WAY	NASHOBA	OK	74558	DARRYLR05@GMAIL.COM	4414456783	4500	01-SEP-16	T	1
1000003	MARIA	BELL	11-JUL-79	1403 PETUNIA WAY	BIRMINGHAM	AL	35209	MARIABELL07@GMAIL.COM	4245056907	5000	01-JAN-15	T	1
1000004	NIJIYA	YAMAMURA	16-OCT-82	452-1119 TAKAGAWARA	ISHII-CHO	TOKUSHIMA	-	NIJIYA16@GMAIL.COM	498587149	3500	01-SEP-21	T	81
1000005	ALBERT	HUDSON	10-OCT-80	1003 BRENTWOOD DRIVE	COUPLAND	TX	78615	ALBERTH10@GMAIL.COM	4663615746	4500	01-JAN-16	T	1
1000006	TAO	TIEN	17-OCT-90	644 FENGYANG ROAD	JIANGAN	SHANGHAI	200023	TAOTIEN1017@GMAIL.COM	13073352797	3500	01-SEP-21	T	86
1000007	VIR	TRIKHA	13-MAY-79	1005, A WING, MITTAL TOWERS	BANGALORE	KARNATAKA	560001	VIRTRIKHA13@GMAIL.COM	8025582470	4500	01-JAN-16	T	91
1000008	RUILIN	HE	22-OCT-80	200 UPPER THOMSON ROAD	SINGAPORE	-	574424	RUILINHE22@GMAIL.COM	62568145	4500	01-JAN-16	T	65
1000009	SIMON	CHAPMAN	10-JAN-80	95 OVERTON CIRCLE	LITTLE WELNETHAM	-	IP30 7HH	SIMONCHAP10@GMAIL.COM	7878537202	4500	01-JAN-16	T	44
1000010	DONALD	COLLINS	18-SEP-75	2562 ARMBRESTER DRIVE	CULVER CITY	CA	90232	DONALDC18@GMAIL.COM	6144631983	5000	01-JAN-15	T	1
1000011	LINSEY	FINDLAY	30-JUL-72	2722 TEA BERRY LANE	WAUSAU	WI	54403	LINSEYF30@GMAIL.COM	3885490812	6000	01-JAN-15	T	1
1000012	DOUGLAS	ROBINSON	27-FEB-70	3617 HEAVNER AVENUE	MARIETTA	GA	30064	DOUGLASR27@GMAIL.COM	6702497100	6000	01-JAN-15	T	1
1000013	NORMA	GILL	06-APR-79	3997 BEN STREET	NORTH CREEK	NY	12853	NORMAG06@GMAIL.COM	5182510782	5500	01-SEP-16	T	1
1000014	BOBBY	WEST	07-APR-76	1223 WOODSTOCK DRIVE	EL MONTE	CA	91731	BOBBYW07@GMAIL.COM	6265795209	5500	01-SEP-16	O	1
1000015	MAYZE	SCHIAVONE	29-AUG-77	4952 WOLF PEN ROAD	BURLINGAME	CA	94010	MAYZES29@GMAIL.COM	6503403753	5000	01-SEP-18	O	1
1000016	SUE	DAWSON	10-AUG-85	1889 CAYNOR CIRCLE	RED BANK	NJ	07701	SUEDAWSON10@GMAIL.COM	9085835639	4000	01-JAN-20	O	1

Download CSV

16 rows selected.

After the subquery:

```
382 UPDATE EMPLOYEE
383 SET SALARY= SALARY * 1.25
384 WHERE 'PHD' IN (SELECT DEGREE FROM TEACHER WHERE TEACHER.EMPLOYEE_ID = EMPLOYEE.EMPLOYEE_ID);
385 SELECT * FROM EMPLOYEE
```

EMPLOYEE_ID	FNAME	LNAME	DOB	STREET	CITY	STATE	ZIPCODE	EMAIL	PHONE_NUMBER	SALARY	HIRE_DATE	EMPLOYEE_TYPE	COUNTRY_ID
1000001	STEVE	RICKEY	10-JAN-80	4467 POWDER HOUSE ROAD	DELRAY BEACH	FL	33484	STEVER01@GMAIL.COM	5917102067	5625	01-JAN-16	T	1
1000002	DARRYL	RUSS	10-MAY-81	3925 HEATHER SEES WAY	NASHOBA	OK	74558	DARRYLR05@GMAIL.COM	4414456783	4500	01-SEP-16	T	1
1000003	MARIA	BELL	11-JUL-79	1403 PETUNIA WAY	BIRMINGHAM	AL	35209	MARIABELL07@GMAIL.COM	4245056907	6250	01-JAN-15	T	1
1000004	NIJIYA	YAMAMURA	16-OCT-82	452-1119 TAKAGAWARA	ISHII-CHO	TOKUSHIMA	-	NIJIYA16@GMAIL.COM	498587149	4375	01-SEP-21	T	81
1000005	ALBERT	HUDSON	10-OCT-80	1003 BRENTWOOD DRIVE	COUPLAND	TX	78615	ALBERTH10@GMAIL.COM	4663615746	5625	01-JAN-16	T	1
1000006	TAO	TIEN	17-OCT-90	644 FENGYANG ROAD	JIANGAN	SHANGHAI	200023	TAOTIEN1017@GMAIL.COM	13073352797	4375	01-SEP-21	T	86
1000007	VIR	TRIKHA	13-MAY-79	1005, A WING, MITTAL TOWERS	BANGALORE	KARNATAKA	560001	VIRTRIKHA13@GMAIL.COM	8025582470	5625	01-JAN-16	T	91
1000008	RUILIN	HE	22-OCT-80	200 UPPER THOMSON ROAD	SINGAPORE	-	574424	RUILINHE22@GMAIL.COM	62568145	5625	01-JAN-16	T	65
1000009	SIMON	CHAPMAN	10-JAN-80	95 OVERTON CIRCLE	LITTLE WELNETHAM	-	IP30 7HH	SIMONCHAP10@GMAIL.COM	7878537202	5625	01-JAN-16	T	44
1000010	DONALD	COLLINS	18-SEP-75	2562 ARMBRESTER DRIVE	CULVER CITY	CA	90232	DONALDC18@GMAIL.COM	6144631983	6250	01-JAN-15	T	1
1000011	LINSEY	FINDLAY	30-JUL-72	2722 TEA BERRY LANE	WAUSAU	WI	54403	LINSEYF30@GMAIL.COM	3885490812	7500	01-JAN-15	T	1
1000012	DOUGLAS	ROBINSON	27-FEB-70	3617 HEAVNER AVENUE	MARIETTA	GA	30064	DOUGLASR27@GMAIL.COM	6702497100	7500	01-JAN-15	T	1
1000013	NORMA	GILL	06-APR-79	3997 BEN STREET	NORTH CREEK	NY	12853	NORMAG06@GMAIL.COM	5182510782	6875	01-SEP-16	T	1
1000014	BOBBY	WEST	07-APR-76	1223 WOODSTOCK DRIVE	EL MONTE	CA	91731	BOBBYW07@GMAIL.COM	6265795209	5500	01-SEP-16	0	1
1000015	MAYZE	SCHIAVONE	29-AUG-77	4952 WOLF PEN ROAD	BURLINGAME	CA	94010	MAYZES29@GMAIL.COM	6503403753	5000	01-SEP-18	0	1
1000016	SUE	DAWSON	10-AUG-85	1889 CAYNOR CIRCLE	RED BANK	NJ	07701	SUEDAWSON10@GMAIL.COM	9085835639	4000	01-JAN-20	0	1

Download CSV

16 rows selected.

1) Statement:
The purpose of using this sub-query is to check the students who take course 20001, because the instructor would like to send an email notification before the class begins. Also, the instructor would like to assign a group project and decides who is in Group A.

2) SQL Query:

```
Select *
from Student a
Where a.Student_ID In (Select b.Student_ID From "Order" b Join Order_Course c On
b.Order_ID = c.Order_ID Where c.Course_ID=20001)
```

3) Screenshot of result from SQL query
Before the update:

```
383  Select *
384  from Student
```

STUDENT_ID	FNAME	LNAME	DOB	STREET	CITY	STATE	ZIPCODE	EMAIL	PHONE_NUMBER	COUNTRY_ID
1	STEVE	ROGGERS	31-DEC-93	101 MAIN ST	BOSTON	MA	02129	SROGGERS@GMAIL.COM	2023214455	1
2	JIANG	LI	13-OCT-96	81 STREET	SUZHOU	JIANGSU	215000	JIANGLI@GMAIL.COM	15502003333	86
3	JOAN	MIRO	25-SEP-97	35 LOWER MARSH	LONDON	-	5208	JOANM97@GMAIL.COM	2055891145	44
4	ALLIE	GRATER	15-DEC-96	43 3RD ST	NEW YORK	NY	10007	ALGRATER@GMAIL.COM	9293216635	1
5	KARAN	NIGAM	16-JAN-97	5 TEMPLE TANK ROAD	DELHI	DELHI	110014	KNIGAM@GMAIL.COM	24376836	91
6	RYAN	MARWAH	09-OCT-97	JI WR SUPRATMAN	JEMBER	PROBOLINGGO	68137	RYANMA9@GMAIL.COM	331489584	62
7	ZULAIKHA	SARIM	11-AUG-95	1039 TAMAN CITY	KUALA LUMPUR	MALAYSIA	51200	ZULAIKHAS@GMAIL.COM	362583570	60
8	YONGBIN	LAI	01-NOV-94	357D HOLLAND ROAD	SINGAPORE	-	278634	YONGBINL1@GMAIL.COM	64666137	65
9	KUBA	KAYO	18-MAR-96	5-1, SUSUGAYA	HIRAKAWA	AOMORI	-	KAYO1803@GMAIL.COM	2187208031	81
10	CHRIS	RATKE	06-JUN-97	405 HIGHWOOD CIR	JUPITER	FL	33458	CHRISK06@GMAIL.COM	5612228250	1
11	VITA	TOWNE	07-JUL-97	3701 KIRBY DR	HOUSTON	TX	77098	VITAT08@GMAIL.COM	8326544595	1
12	CHRISTELLE	RIPPIN	19-MAY-96	74999 FRANK ST	PALM DESERT	CA	92211	CHRISTELLE19@GMAIL.COM	7603465722	1
13	KIRK	BACH	20-MAY-97	2131 LAS PALMAS DR	CARISBAD	CA	92011	BACH52097@GMAIL.COM	6194446568	1
14	TYREE	ZULUF	10-SEP-97	3712 MAIN ST	CHUTA VISTA	CA	91911	TYREE0910@GMAIL.COM	6194252040	1
15	SANTIAGO	BARTELL	20-DEC-97	1250 I ST NW	WASHINGTON	DE	20005	SANTIAGO20@GMAIL.COM	2028980555	1

Download CSV
15 rows selected.

After the subquery:

```
383  Select *
384  from Student a
385  Where a.Student_ID In (Select b.Student_ID From "Order" b Join Order_Course c On b.Order_ID = c.Order_ID Where c.Course_ID=20001)
```

STUDENT_ID	FNAME	LNAME	DOB	STREET	CITY	STATE	ZIPCODE	EMAIL	PHONE_NUMBER	COUNTRY_ID
7	ZULAIKHA	SARIM	11-AUG-95	1039 TAMAN CITY	KUALA LUMPUR	MALAYSIA	51200	ZULAIKHAS@GMAIL.COM	362583570	60
5	KARAN	NIGAM	16-JAN-97	5 TEMPLE TANK ROAD	DELHI	DELHI	110014	KNIGAM@GMAIL.COM	24376836	91

Download CSV
2 rows selected.

Part 2 Two queries using Table joins

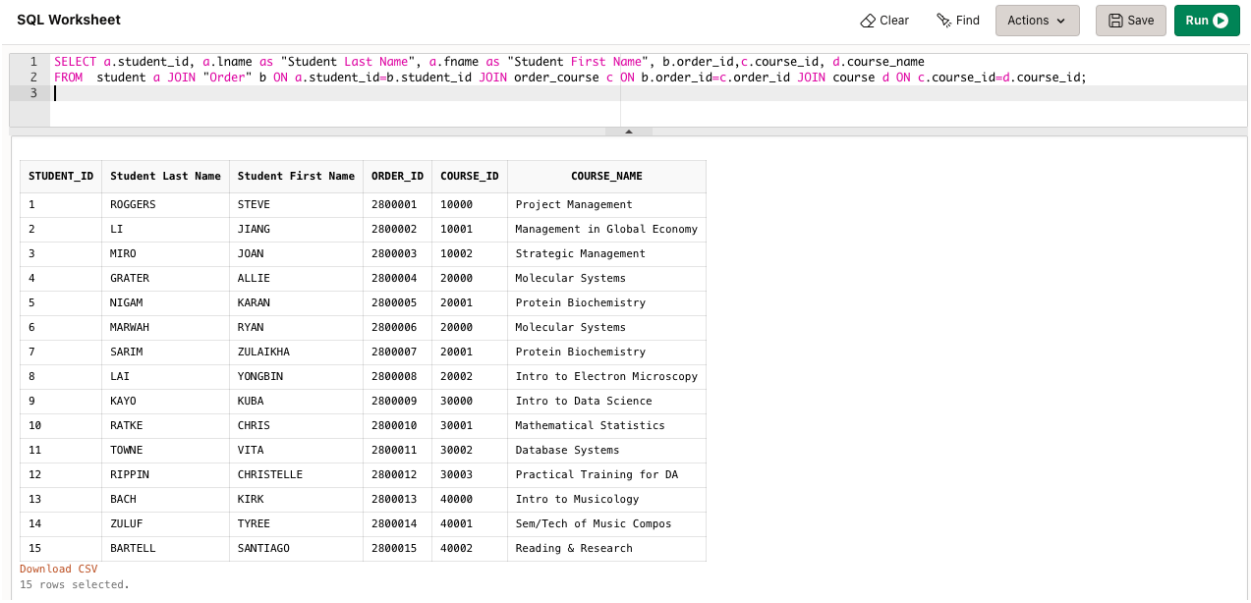
1) Statement:

The purpose of using this query is for our employees to look up the courses that students have chosen in their corresponding orders easily and intuitively. The aggregation of historical orders information enables our educational institution to recommend relevant advanced courses to students based on their progress and needs in the future, so our courses can be better promoted.

2) SQL Query:

SELECT a.student_id, a.lname as "Student Last Name", a.fname as "Student First Name", b.order_id,c.course_id, d.course_name
FROM student a JOIN "Order" b ON a.student_id=b.student_id JOIN order_course c ON b.order_id=c.order_id JOIN course d ON c.course_id=d.course_id;

3) Screenshot of result from SQL query



STUDENT_ID	Student Last Name	Student First Name	ORDER_ID	COURSE_ID	COURSE_NAME
1	ROGGERS	STEVE	2800001	10000	Project Management
2	LI	JIANG	2800002	10001	Management in Global Economy
3	MIRO	JOAN	2800003	10002	Strategic Management
4	GRATER	ALLIE	2800004	20000	Molecular Systems
5	NIGAM	KARAN	2800005	20001	Protein Biochemistry
6	MARWAH	RYAN	2800006	20000	Molecular Systems
7	SARIM	ZULAIKHA	2800007	20001	Protein Biochemistry
8	LAI	YONGBIN	2800008	20002	Intro to Electron Microscopy
9	KAYO	KUBA	2800009	30000	Intro to Data Science
10	RATKE	CHRIS	2800010	30001	Mathematical Statistics
11	TOWNE	VITA	2800011	30002	Database Systems
12	RIPPIN	CHRISTELLE	2800012	30003	Practical Training for DA
13	BACH	KIRK	2800013	40000	Intro to Musicology
14	ZULUF	TYREE	2800014	40001	Sem/Tech of Music Compos
15	BARTELL	SANTIAGO	2800015	40002	Reading & Research

Download CSV
15 rows selected.

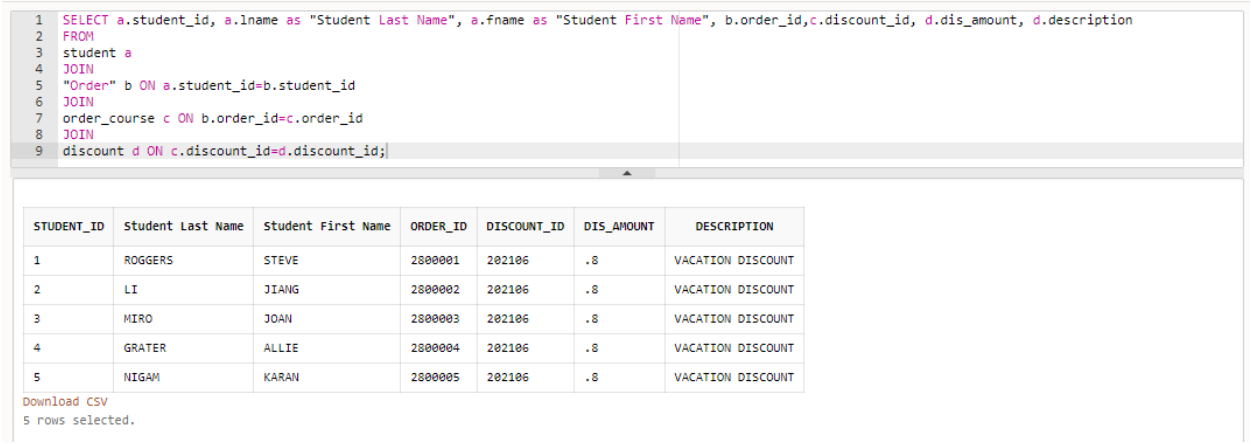
1) Statement:

With this table join query, it's easy to find out how many students are buying the course and what kind of discount are they using. Through this query, we can explore the degree of discount consumers like and study the sales volume of discount.

2) SQL Query:

```
SELECT a.student_id, a.lname as "Student Last Name", a.fname as "Student First Name",
b.order_id,c.discount_id, d.dis_amount, d.description
FROM
student a
JOIN
"Order" b ON a.student_id=b.student_id
JOIN
order_course c ON b.order_id=c.order_id
JOIN
discount d ON c.discount_id=d.discount_id;
```

3) Screenshot of result from SQL query



```
1  SELECT a.student_id, a.lname as "Student Last Name", a.fname as "Student First Name", b.order_id,c.discount_id, d.dis_amount, d.description
2  FROM
3  student a
4  JOIN
5  "Order" b ON a.student_id=b.student_id
6  JOIN
7  order_course c ON b.order_id=c.order_id
8  JOIN
9  discount d ON c.discount_id=d.discount_id;
```

STUDENT_ID	Student Last Name	Student First Name	ORDER_ID	DISCOUNT_ID	DIS_AMOUNT	DESCRIPTION
1	ROGGERS	STEVE	2800001	202106	.8	VACATION DISCOUNT
2	LI	JIANG	2800002	202106	.8	VACATION DISCOUNT
3	MIRO	JOAN	2800003	202106	.8	VACATION DISCOUNT
4	GRATER	ALLIE	2800004	202106	.8	VACATION DISCOUNT
5	NIGAM	KARAN	2800005	202106	.8	VACATION DISCOUNT

Download CSV

5 rows selected.

Part 3 One View

1) Statement:

This View is created mainly for staff to quickly search and easily find out all the teachers who's nationality is the United States. We can know the United States teachers' names, contact details, salary, etc within one chart. With this View, our company are able to better understand the overall conditions of our US faculty, which allow us to evaluate their performance and decide whether continue to hire them, subsidy them or not.

2) SQL Query:

```
CREATE OR REPLACE VIEW US_teacher
AS
SELECT
    b.employee_ID, b.Fname "First Name", b.Lname "Last Name", b.Email, b. Phone_Number,
b.SALARY, c.Degree,
    c."Level", c.SUBJECTS_TAUGHT,a.COUNTRY_NAME
FROM
    Country a
        join
    Employee b on a.Country_ID = b.Country_ID
        join
    Teacher c on b.employee_ID = c. employee_ID
Where
    a.COUNTRY_ID = 1;

Select * from US_teacher;
-----------------------------------------------------
Select *
from US_teacher
Where SALARY >=5000 and DEGREE = 'PHD';
```

3) Screenshots of result from SQL query

SQL Worksheet

Clear Find Actions Save Run

```
12
13  -- Create a view of all the teacher from United States
14
15  Create or Replace view US_teacher
16  as
17  Select
18      b.employee_ID, b.Fname "first name", b.Lname "Last name", b.EMAIL, b.PHONE_NUMBER, b.SALARY, c.DEGREE,
19      c."Level", c.SUBJECTS_TAUGHT, a.COUNTRY_NAME
20  from
21      Country a
22          join
23      Employee b on a.Country_ID = b.Country_ID
24          join
25      Teacher c on b.employee_ID = c.employee_ID
26  Where
27      a.COUNTRY_ID = 1;
28
29
30  -- -- select from the view
31
32  select * from US_teacher;
```

View created.

SQL Worksheet

Clear Find Actions Save Run

```
13  -- Create a view of all the teacher from United States
14
15  Create or Replace view US_teacher
16  as
17  Select
18      b.employee_ID, b.Fname "first name", b.Lname "Last name", b.EMAIL, b.PHONE_NUMBER, b.SALARY, c.DEGREE,
19      c."Level", c.SUBJECTS_TAUGHT, a.COUNTRY_NAME
20  from
21      Country a
22          join
23      Employee b on a.Country_ID = b.Country_ID
24          join
25      Teacher c on b.employee_ID = c.employee_ID
26  Where
27      a.COUNTRY_ID = 1;
28
29
30  -- -- select from the view
31
32  select * from US_teacher;
33
```

EMPLOYEE_ID	first name	Last name	EMAIL	PHONE_NUMBER	SALARY	DEGREE	Level	SUBJECTS_TAUGHT	COUNTRY_NAME
1000001	STEVE	RICKEY	STEVER01@GMAIL.COM	5917102067	4500	PHD	S	Project Management	UNITED STATES
1000002	DARRYL	RUSS	DARRYLR05@GMAIL.COM	4414456783	4500	Master	A	Management in Global Economy	UNITED STATES
1000003	MARIA	BELL	MARIABELL07@GMAIL.COM	4245056907	5000	PHD	S	Strategic Management	UNITED STATES
1000005	ALBERT	HUDSON	ALBERTH10@GMAIL.COM	4663615746	4500	PHD	S	Protein Biochemistry	UNITED STATES
1000010	DONALD	COLLINS	DONALDC18@GMAIL.COM	6144631983	5000	PHD	SS	Practical Training for DA	UNITED STATES
1000011	LINSEY	FINDLAY	LINSEYF30@GMAIL.COM	3885490812	6000	PHD	A	Intro to Musicology	UNITED STATES
1000012	DOUGLAS	ROBINSON	DOUGLASR27@GMAIL.COM	6702497100	6000	PHD	A	Sem/Tech of Music Compos	UNITED STATES
1000013	NORMA	GILL	NORMAG06@GMAIL.COM	5182510782	5500	PHD	S	Reading & Research	UNITED STATES

Download CSV

8 rows selected.

SQL Worksheet

Clear Find Actions Save Run

```
21      Country a
22          join
23      Employee b on a.Country_ID = b.Country_ID
24          join
25      Teacher c on b.employee_ID = c.employee_ID
26  Where
27      a.COUNTRY_ID = 1;
28
29
30  -- -- select from the view
31
32  select * from US_teacher;
33
34  -- select teachers that from United States and have a PHD degree and have a salary no less than 5000$
35
36  select *
37  from US_teacher
38  where SALARY >= 5000 and DEGREE = 'PHD';
39
40
41
```

EMPLOYEE_ID	first name	Last name	EMAIL	PHONE_NUMBER	SALARY	DEGREE	Level	SUBJECTS_TAUGHT	COUNTRY_NAME
1000003	MARIA	BELL	MARIABELL07@GMAIL.COM	4245056907	5000	PHD	S	Strategic Management	UNITED STATES
1000010	DONALD	COLLINS	DONALDC18@GMAIL.COM	6144631983	5000	PHD	SS	Practical Training for DA	UNITED STATES
1000011	LINSEY	FINDLAY	LINSEYF30@GMAIL.COM	3885490812	6000	PHD	A	Intro to Musicology	UNITED STATES
1000012	DOUGLAS	ROBINSON	DOUGLASR27@GMAIL.COM	6702497100	6000	PHD	A	Sem/Tech of Music Compos	UNITED STATES
1000013	NORMA	GILL	NORMAG06@GMAIL.COM	5182510782	5500	PHD	S	Reading & Research	UNITED STATES

Download CSV

5 rows selected.

Work Distribution

Part 1 Two queries using sub-queries

Sub-query (1): Borui Li
Sub-query (2): Jay Jiang

Part 2 Two queries using Table joins

Table joins query (1): Zhiwei Liang
Table joins query (2): Jiaxuan Wang

Part 3 One View

Felix Huang, Peilin Li

Individual Learning Outcome

I have learned a lot in this class about Oracle Database and SQL languages. SQL wasn't foreign to me, I have worked with SQL in the past, but it's more on the DML side. However, I have learned more advanced queries and functions and the DDL language. I can utilize the knowledge that I learned in my current job. I think things that I learned in the class will be very important in my data analytics careers.

The two projects that we did in the class are very beneficial to us in terms of getting familiarize with the sql queries and the process of designing a database, which is essential to the modern business.