Practical 1

Introduction to Structured Query Language (SQL)

Learning outcomes:

- Know the basic commands and functions of SQL
- Use SQL for data administration (to create tables and indexes)
- Analyse, apply and use SQL for data manipulation (to add, modify, delete, and retrieve data)
- Apply SQL to query a database for useful information.

Instructions:

- All code must be done in MySQL command window (please change the command window to a white background with black text).
- Use the Windows 'snipping tool' to take screenshots of each and every line of code written and save it to a pdf.
- Rename the pdf file as follows and submit on eFundi:
  - **12345678_Initials_Surname**.pdf >>> **12345678** is your student number.

Study the case study below and use SQL commands to answer the questions 1 – 11:

- ConstructCo database stores data for a consulting company that tracks all charges to projects. The charges are based on the hours each employee works on each project. The Entity Relationship Diagram (ERD) and contents of the ConstructCo database are shown below. Note: The ASSIGNMENT table stores the JOB_CHG_HOUR values as an attribute (ASSIGN_CHG_HR) to maintain historical accuracy of the data. The JOB_CHG_HOUR values are likely to change over time. In fact, a JOB_CHG_HOUR change will be reflected in the ASSIGNMENT table. Naturally, the employee primary job assignment might also change, so the ASSIGN_JOB is also stored. Because those attributes are required to maintain the historical accuracy of the data, they are not redundant.

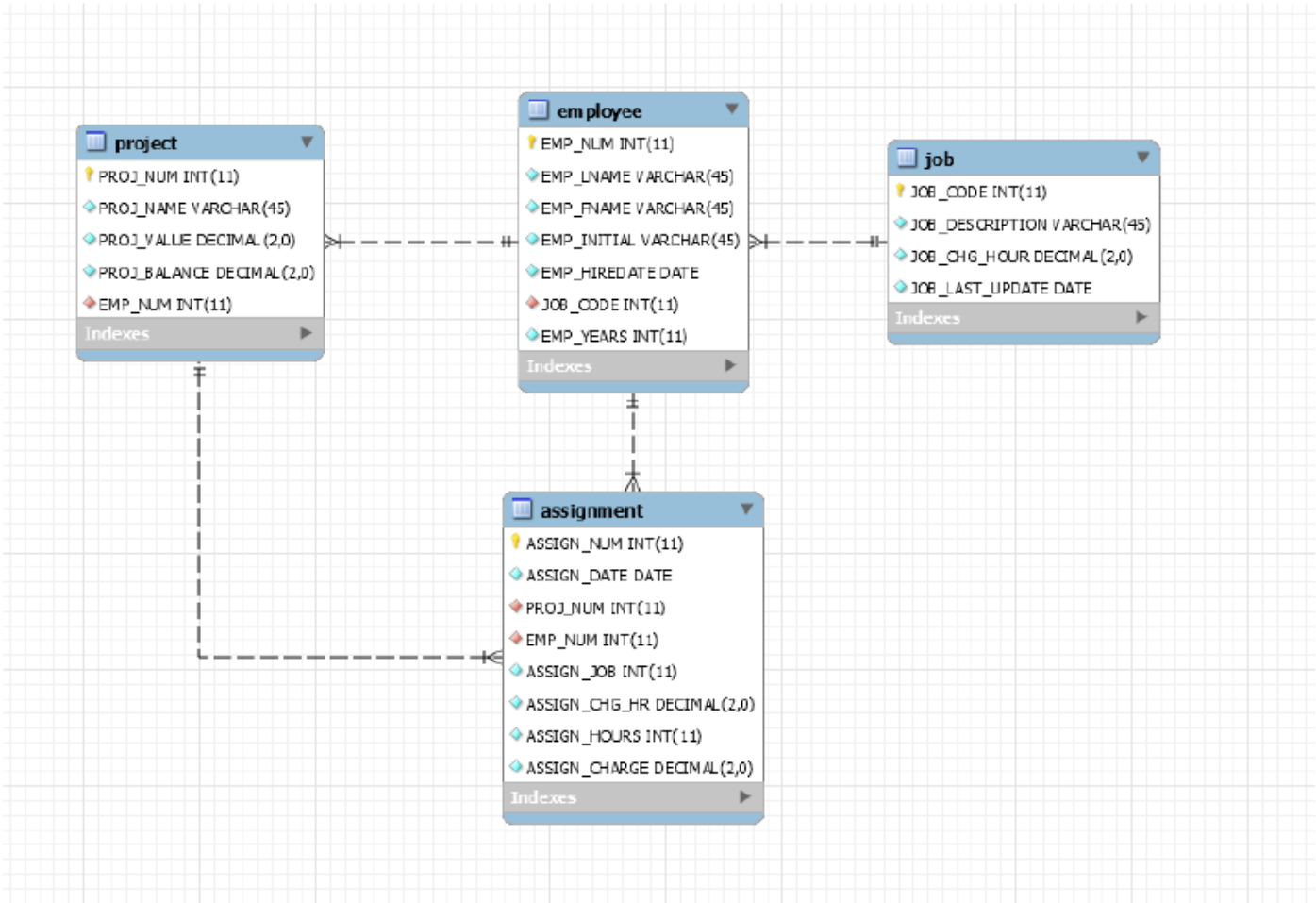

Figure 1: Entity Relationship Diagram

Table name: JOB

JOB_CODE	JOB_DESCRIPTION	JOB_CHG_HOUR	JOB_LAST_UPDATE
500	Programmer	35.75	20-Nov-15
501	Systems Analyst	96.75	20-Nov-15
502	Database Designer	125.00	24-Mar-16
503	Electrical Engineer	84.50	20-Nov-15
504	Mechanical Engineer	67.90	20-Nov-15
505	Civil Engineer	55.78	20-Nov-15
506	Clerical Support	26.87	20-Nov-15
507	DSS Analyst	45.95	20-Nov-15
508	Applications Designer	48.10	24-Mar-16
509	Bio Technician	34.55	20-Nov-15
510	General Support	18.36	20-Nov-15

Table name: Project

PROJ_NUM	PROJ_NAME	PROJ_VALUE	PROJ_BALANCE	EMP_NUM
15	Evergreen	1453500.00	1002350.00	103
18	Amber Wave	3500500.00	2110346.00	108
22	Rolling Tide	805000.00	500345.20	102
25	Starflight	2650500.00	2309880.00	107

Table name: Assignment

ASSIGN_NUM	ASSIGN_DATE	PROJ_NUM	EMP_NUM	ASSIGN_JOB	ASSIGN_CHG_HR	ASSIGN_HOURS	ASSIGN_CHARGE
1001	22-Mar-16	18	103	503	84.50	3.5	295.75
1002	22-Mar-16	22	117	509	34.55	4.2	145.11
1003	22-Mar-16	18	117	509	34.55	2.0	69.10
1004	22-Mar-16	18	103	503	84.50	5.9	498.55
1005	22-Mar-16	25	108	501	96.75	2.2	212.85
1006	22-Mar-16	22	104	501	96.75	4.2	406.35
1007	22-Mar-16	25	113	508	50.75	3.8	192.85
1008	22-Mar-16	18	103	503	84.50	0.9	76.05
1009	23-Mar-16	15	115	501	96.75	5.6	541.80
1010	23-Mar-16	15	117	509	34.55	2.4	82.92
1011	23-Mar-16	25	105	502	105.00	4.3	451.50
1012	23-Mar-16	18	108	501	96.75	3.4	328.95
1013	23-Mar-16	25	115	501	96.75	2.0	193.50
1014	23-Mar-16	22	104	501	96.75	2.8	270.90
1015	23-Mar-16	15	103	503	84.50	6.1	515.45
1016	23-Mar-16	22	105	502	105.00	4.7	493.50
1017	23-Mar-16	18	117	509	34.55	3.8	131.29
1018	23-Mar-16	25	117	509	34.55	2.2	76.01

Table name: Employee

EMP_NUM	EMP_LNAME	EMP_FNAME	EMP_INITIAL	EMP_HIREDATE	JOB_CODE	EMP_YEARS
101	News	John	G	08-Nov-00	502	12
102	Senior	David	H	12-Jul-89	501	23
103	Arbough	June	E	01-Dec-96	500	18
104	Ramoras	Anne	K	15-Nov-87	501	25
105	Johnson	Alice	K	01-Feb-93	502	19
106	Smithfield	William		22-Jun-04	500	8
107	Alonzo	Maria	D	10-Oct-93	500	19
108	Washington	Ralph	B	22-Aug-91	501	21
109	Smith	Larry	W	18-Jul-97	501	15
110	Olenko	Gerald	A	11-Dec-95	505	17
111	Wabash	Geoff	B	04-Apr-91	506	21
112	Smithson	Darlene	M	23-Oct-94	507	18
113	Joenbrood	Delbert	K	15-Nov-96	508	16
114	Jones	Annelise		20-Aug-93	508	19
115	Bawangi	Travis	B	25-Jan-92	501	20
116	Pratt	Gerald	L	05-Mar-97	510	15
117	Williamson	Angie	H	19-Jun-96	509	16
118	Frommer	James	J	04-Jan-05	510	7

1. Install the database software package (MariaDB) and start the MySQL command window.
2. Write the SQL code to create the database ConstructCo, name it as **12345678_ConstructCo** (where 12345678 >>> your student number).
3. Write the SQL code that will create the table structure for table Employee and display it.
4. Having created the Employee table structure in Q3, write the SQL code to enter the first five (5) rows of the employee table.
5. Write the SQL code that will list all attributes for a job code of '502'.
6. Write the SQL code to change the job code to 502 for the person whose employee number (EMP_NUM) is '103'.
7. Write the SQL code to delete the row for 'Senior David', who was hired on '12 July 1989' and whose job code is '501' (hint: use logical operators).
8. Write the SQL code to add attributes EMP_PCT and PROJ_NUM to the employee table structure. The EMP_PCT is the bonus percentage to be paid to each employee with a default value of 12.5%. The new attribute characteristics are:
    a. EMP_PCT DECIMAL(2,2)
    b. PROJ_NUM INT(3)

    (Display the new table structure and contents for employee table)

9. Using a single command sequence, write the SQL code that will change the project number (PROJ_NUM) to '22' for all employees whose job classification (JOB_CODE) is '501' or higher.
10. Write the SQL code to remove all employees without a project number from the employee table.
11. Delete table Employee and finally delete your database.