

# Lab 4

Consider the following database for student enrolment for course:

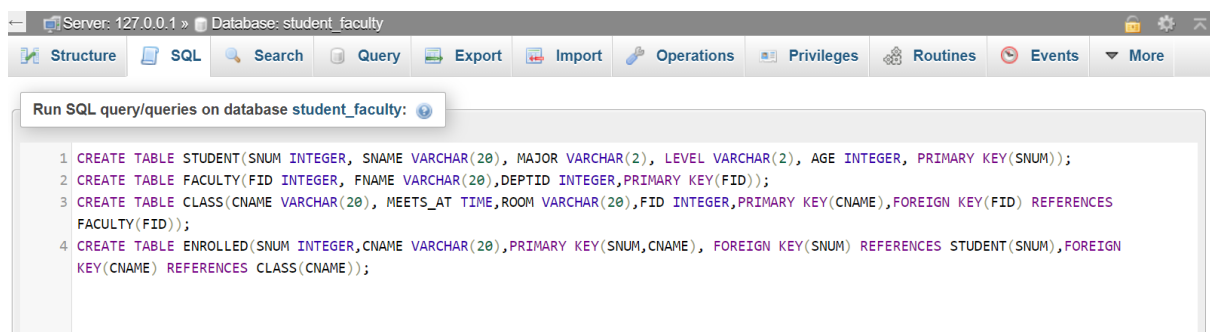
STUDENT (snum: integer, sname: string, major: string, level: string, age: integer)

CLASS (name: string, meets at: time, room: string, fid: integer)

ENROLLED (snum: integer, cname: string)

FACULTY (fid: integer, fname: string, deptid: integer)

The meaning of these relations is straightforward; for example, Enrolled has one record per student-class pair such that the student is enrolled in the class. Level is a two character code with 4 different values (example: Junior: JR etc)



```
1 CREATE TABLE STUDENT(SNUM INTEGER, SNAME VARCHAR(20), MAJOR VARCHAR(2), LEVEL VARCHAR(2), AGE INTEGER, PRIMARY KEY(SNUM));
2 CREATE TABLE FACULTY(FID INTEGER, FNAME VARCHAR(20), DEPTID INTEGER, PRIMARY KEY(FID));
3 CREATE TABLE CLASS(CNAME VARCHAR(20), MEETS_AT TIME, ROOM VARCHAR(20), FID INTEGER, PRIMARY KEY(CNAME), FOREIGN KEY(FID) REFERENCES
  FACULTY(FID));
4 CREATE TABLE ENROLLED(SNUM INTEGER, CNAME VARCHAR(20), PRIMARY KEY(SNUM, CNAME), FOREIGN KEY(SNUM) REFERENCES STUDENT(SNUM), FOREIGN
  KEY(CNAME) REFERENCES CLASS(CNAME));
```

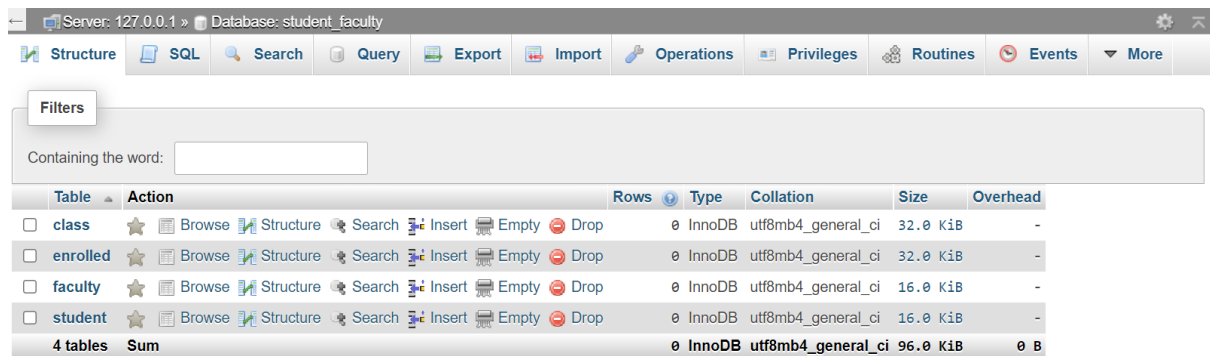


Table	Action	Rows	Type	Collation	Size	Overhead
<input type="checkbox"/> class	Browse  Structure  Search  Insert  Empty  Drop	0	InnoDB	utf8mb4_general_ci	32.0 KiB	-
<input type="checkbox"/> enrolled	Browse  Structure  Search  Insert  Empty  Drop	0	InnoDB	utf8mb4_general_ci	32.0 KiB	-
<input type="checkbox"/> faculty	Browse  Structure  Search  Insert  Empty  Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
<input type="checkbox"/> student	Browse  Structure  Search  Insert  Empty  Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
4 tables	Sum	0	InnoDB	utf8mb4_general_ci	96.0 KiB	0 B

‘STUDENT’ TABLE:

✔ 1 row inserted. (Query took 0.1049 seconds.)

```
INSERT INTO STUDENT(SNUM,SNAME,MAJOR,LEVEL,AGE)VALUES(1,'Sam','CS','Sr',21)
```

[Edit inline] [ Edit ] [ Create PHP code ]

✔ 1 row inserted. (Query took 0.0532 seconds.)

```
INSERT INTO STUDENT(SNUM,SNAME,MAJOR,LEVEL,AGE)VALUES(2,'Suraj','CS','Jr',19)
```

[Edit inline] [ Edit ] [ Create PHP code ]

✔ 1 row inserted. (Query took 0.1019 seconds.)

```
INSERT INTO STUDENT(SNUM,SNAME,MAJOR,LEVEL,AGE)VALUES(3,'Raj','CS','Sr',20)
```

[Edit inline] [ Edit ] [ Create PHP code ]

✔ 1 row inserted. (Query took 0.0232 seconds.)

```
INSERT INTO STUDENT(SNUM,SNAME,MAJOR,LEVEL,AGE)VALUES(4,'Sita','CS','Jr',19)
```

[Edit inline] [ Edit ] [ Create PHP code ]

✔ 1 row inserted. (Query took 0.0382 seconds.)

```
INSERT INTO STUDENT(SNUM,SNAME,MAJOR,LEVEL,AGE)VALUES(5,'Zeeshan','CS','Sr',21)
```

[Edit inline] [ Edit ] [ Create PHP code ]

✔ 1 row inserted. (Query took 0.0516 seconds.)

```
INSERT INTO STUDENT(SNUM,SNAME,MAJOR,LEVEL,AGE)VALUES(6,'Shweta','CS','Sr',20)
```

[Edit inline] [ Edit ] [ Create PHP code ]

✔ Showing rows 0 - 5 (6 total, Query took 0.0016 seconds.)

```
SELECT*FROM STUDENT
```

[Edit inline] [ Edit ] [ Create PHP code ]

☐ Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

		SNUM	SNAME	MAJOR	LEVEL	AGE
<input type="checkbox"/>	Edit Copy Delete	1	Sam	CS	Sr	21
<input type="checkbox"/>	Edit Copy Delete	2	Suraj	CS	Jr	19
<input type="checkbox"/>	Edit Copy Delete	3	Raj	CS	Sr	20
<input type="checkbox"/>	Edit Copy Delete	4	Sita	CS	Jr	19
<input type="checkbox"/>	Edit Copy Delete	5	Zeeshan	CS	Sr	21
<input type="checkbox"/>	Edit Copy Delete	6	Shweta	CS	Sr	20

'FACULTY' TABLE:

✓ 1 row inserted. (Query took 0.0722 seconds.)

```
INSERT INTO FACULTY(FID,FNAME,DEPTID)VALUES(11,'Harsh',1000)
```

[Edit inline] [ Edit ] [ Create PHP code ]

✓ 1 row inserted. (Query took 0.0678 seconds.)

```
INSERT INTO FACULTY(FID,FNAME,DEPTID)VALUES(12,'Vajay',1000)
```

[Edit inline] [ Edit ] [ Create PHP code ]

✓ 1 row inserted. (Query took 0.1232 seconds.)

```
INSERT INTO FACULTY(FID,FNAME,DEPTID)VALUES(13,'Ram',1001)
```

[Edit inline] [ Edit ] [ Create PHP code ]

✓ 1 row inserted. (Query took 0.0372 seconds.)

```
INSERT INTO FACULTY(FID,FNAME,DEPTID)VALUES(14,'Roopa',1002)
```

[Edit inline] [ Edit ] [ Create PHP code ]

✓ 1 row inserted. (Query took 0.0380 seconds.)

```
INSERT INTO FACULTY(FID,FNAME,DEPTID)VALUES(15,'Nandini',1000)
```

[Edit inline] [ Edit ] [ Create PHP code ]

✓ Showing rows 0 - 4 (5 total, Query took 0.0016 seconds.)

```
SELECT*FROM FACULTY
```

[Edit inline] [ Edit ] [ Create PHP code ]

☐ Show all

Number of rows: 

25

Filter rows: 

Search this table

Sort by key: 

None

+ Options

		FID	FNAME	DEPTID
<input type="checkbox"/>	Edit  Copy  Delete	11	Harsh	1000
<input type="checkbox"/>	Edit  Copy  Delete	12	Vajay	1000
<input type="checkbox"/>	Edit  Copy  Delete	13	Ram	1001
<input type="checkbox"/>	Edit  Copy  Delete	14	Roopa	1002
<input type="checkbox"/>	Edit  Copy  Delete	15	Nandini	1000

'CLASS' TABLE:

✓ Showing rows 0 - 7 (8 total, Query took 0.0034 seconds.)

```
SELECT*FROM CLASS
```

[Edit inline] [ Edit ] [ Create PHP code ]

☐ Show all

Number of rows: 

25

Filter rows: 

Search this table

Sort by key: 

None

+ Options

		CNAME	MEETS_AT	ROOM	FID
<input type="checkbox"/>	Edit  Copy  Delete	class1	10:15:16	R1	14
<input type="checkbox"/>	Edit  Copy  Delete	class10	10:15:16	R128	14
<input type="checkbox"/>	Edit  Copy  Delete	class2	10:15:20	R2	12
<input type="checkbox"/>	Edit  Copy  Delete	class3	10:15:25	R3	11
<input type="checkbox"/>	Edit  Copy  Delete	class4	20:15:20	R4	14
<input type="checkbox"/>	Edit  Copy  Delete	class5	20:15:20	R3	15
<input type="checkbox"/>	Edit  Copy  Delete	class6	13:20:20	R2	14
<input type="checkbox"/>	Edit  Copy  Delete	class7	10:10:10	R3	14

## 'ENROLLED' TABLE:

✔ 1 row inserted. (Query took 0.0895 seconds.)

```
INSERT INTO ENROLLED(SNUM,CNAME)VALUES(1,'class1')
```

[\[Edit inline\]](#) [\[Edit\]](#) [\[Create PHP code\]](#)

✔ 1 row inserted. (Query took 0.0602 seconds.)

```
INSERT INTO ENROLLED(SNUM,CNAME)VALUES(2,'class1')
```

[\[Edit inline\]](#) [\[Edit\]](#) [\[Create PHP code\]](#)

✔ 1 row inserted. (Query took 0.0793 seconds.)

```
INSERT INTO ENROLLED(SNUM,CNAME)VALUES(3,'class3')
```

[\[Edit inline\]](#) [\[Edit\]](#) [\[Create PHP code\]](#)

✔ 1 row inserted. (Query took 0.0390 seconds.)

```
INSERT INTO ENROLLED(SNUM,CNAME)VALUES(4,'class3')
```

[\[Edit inline\]](#) [\[Edit\]](#) [\[Create PHP code\]](#)

✔ 1 row inserted. (Query took 0.0440 seconds.)

```
INSERT INTO ENROLLED(SNUM,CNAME)VALUES(5,'class4')
```

[\[Edit inline\]](#) [\[Edit\]](#) [\[Create PHP code\]](#)

✔ 1 row inserted. (Query took 0.0368 seconds.)

```
INSERT INTO ENROLLED(SNUM,CNAME)VALUES(1,'class5')
```

[\[Edit inline\]](#) [\[Edit\]](#) [\[Create PHP code\]](#)

✔ 1 row inserted. (Query took 0.0582 seconds.)

```
INSERT INTO ENROLLED(SNUM,CNAME)VALUES(2,'class5')
```

[\[Edit inline\]](#) [\[Edit\]](#) [\[Create PHP code\]](#)

✔ 1 row inserted. (Query took 0.0586 seconds.)

```
INSERT INTO ENROLLED(SNUM,CNAME)VALUES(3,'class5')
```

[\[Edit inline\]](#) [\[Edit\]](#) [\[Create PHP code\]](#)

✔ 1 row inserted. (Query took 0.1835 seconds.)

```
INSERT INTO ENROLLED(SNUM,CNAME)VALUES(4,'class5')
```

[\[Edit inline\]](#) [\[Edit\]](#) [\[Create PHP code\]](#)

✔ 1 row inserted. (Query took 0.1641 seconds.)

```
INSERT INTO ENROLLED(SNUM,CNAME)VALUES(5,'class5')
```

[\[Edit inline\]](#) [\[Edit\]](#) [\[Create PHP code\]](#)

Showing rows 0 - 9 (10 total, Query took 0.0025 seconds.)

```
SELECT * FROM ENROLLED
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

	SNUM	CNAME
<input type="checkbox"/> Edit Copy Delete	1	class1
<input type="checkbox"/> Edit Copy Delete	1	class5
<input type="checkbox"/> Edit Copy Delete	2	class1
<input type="checkbox"/> Edit Copy Delete	2	class5
<input type="checkbox"/> Edit Copy Delete	3	class3
<input type="checkbox"/> Edit Copy Delete	3	class5
<input type="checkbox"/> Edit Copy Delete	4	class3
<input type="checkbox"/> Edit Copy Delete	4	class5
<input type="checkbox"/> Edit Copy Delete	5	class4
<input type="checkbox"/> Edit Copy Delete	5	class5

1. Find the names of all Juniors(level=JR) who are enrolled in a class taught by 'Roopa'.

Showing rows 0 - 0 (1 total, Query took 0.0252 seconds.)

```
SELECT DISTINCT S.SNAME FROM STUDENT S, CLASS C, ENROLLED E, FACULTY F WHERE S.SNUM=E.SNUM AND E.CNAME=C.CNAME AND C.FID=F.FID AND FNAME='Roopa' AND S.LEVEL='JR'
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all | Number of rows: 25 | Filter rows: Search this table

+ Options

SNAME
Suraj

2. Find the names of all classes that either meet in room R128 or have five or more Students enrolled.

Showing rows 0 - 1 (2 total, Query took 0.0663 seconds.)

```
SELECT DISTINCT CNAME FROM CLASS WHERE ROOM='R128' OR CNAME IN (SELECT E.CNAME FROM ENROLLED E GROUP BY E.CNAME HAVING COUNT(*)>=5)
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

CNAME
class10
class5

3. Find the names of all students who are enrolled in two classes that meet at the same time.

Showing rows 0 - 0 (1 total, Query took 0.0990 seconds.)

```
SELECT DISTINCT S.SNAME FROM STUDENT S WHERE S.SNUM IN (SELECT E1.SNUM FROM ENROLLED E1, ENROLLED E2, CLASS C1, CLASS C2 WHERE E1.SNUM=E2.SNUM AND E1.CNAME<>E2.CNAME AND E1.CNAME=C1.CNAME AND E2.CNAME=C2.CNAME AND C1.MEETS_AT=C2.MEETS_AT)
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all | Number of rows: 25 | Filter rows: Search this table

+ Options

SNAME
Zeeshan

4. Find the names of faculty members who teach in every room in which some class is taught.

✓ Showing rows 0 - 0 (1 total, Query took 0.1506 seconds.)

```
SELECT F.FNAME,F.FID FROM FACULTY F WHERE F.FID IN(SELECT FID FROM CLASS GROUP BY FID HAVING COUNT(*)=(SELECT COUNT(DISTINCT ROOM) FROM CLASS))
```

☐ Profiling [\[Edit inline\]](#) [\[Edit\]](#) [\[Explain SQL\]](#) [\[Create PHP code\]](#) [\[Refresh\]](#)

☐ Show all | Number of rows: 25 | Filter rows: Search this table

+ Options

	FNAME	FID
<input type="checkbox"/> <a href="#">Edit</a> <a href="#">Copy</a> <a href="#">Delete</a>	Roopa	14

5. Find the names of faculty members for whom the combined enrolment of the courses that they teach is less than five.

✓ Showing rows 0 - 3 (4 total, Query took 0.0276 seconds.)

```
SELECT DISTINCT F.FNAME FROM FACULTY F WHERE 5>(SELECT COUNT(E.SNUM) FROM CLASS C,ENROLLED E WHERE C.CNAME=E.CNAME AND C.FID=F.FID)
```

☐ Profiling [\[Edit inline\]](#) [\[Edit\]](#) [\[Explain SQL\]](#) [\[Create PHP code\]](#) [\[Refresh\]](#)

☐ Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

	FNAME
<input type="checkbox"/> <a href="#">Edit</a> <a href="#">Copy</a> <a href="#">Delete</a>	Harsh
<input type="checkbox"/> <a href="#">Edit</a> <a href="#">Copy</a> <a href="#">Delete</a>	Vajay
<input type="checkbox"/> <a href="#">Edit</a> <a href="#">Copy</a> <a href="#">Delete</a>	Ram
<input type="checkbox"/> <a href="#">Edit</a> <a href="#">Copy</a> <a href="#">Delete</a>	Roopa

6. Find the names of student who are not enrolled in any class.

✓ Showing rows 0 - 0 (1 total, Query took 0.0325 seconds.)

```
SELECT DISTINCT S.SNAME FROM STUDENT S WHERE S.SNUM NOT IN (SELECT E.SNUM FROM ENROLLED E)
```

☐ Profiling [\[Edit inline\]](#) [\[Edit\]](#) [\[Explain SQL\]](#) [\[Create PHP code\]](#) [\[Refresh\]](#)

☐ Show all | Number of rows: 25 | Filter rows: Search this table

+ Options

	SNAME
<input type="checkbox"/> <a href="#">Edit</a> <a href="#">Copy</a> <a href="#">Delete</a>	Shweta

7. For each age value that appears in Student, find the level value that appears most often. For example, if there are more FR level students aged 18 than SR,JR,or SO students aged 18, you should print the pair(18,FR).

✓ Showing rows 0 - 2 (3 total, Query took 0.0394 seconds.) [AGE: 19... - 21...]

```
SELECT S.AGE,S.LEVEL FROM STUDENT S GROUP BY S.AGE,S.LEVEL HAVING S.LEVEL IN(SELECT S1.LEVEL FROM STUDENT S1 WHERE S1.AGE=S.AGE GROUP BY S1.AGE,S1.LEVEL HAVING COUNT(*)>=ALL (SELECT COUNT(*) FROM STUDENT S2 WHERE S1.AGE=S2.AGE GROUP BY S2.LEVEL,S2.AGE)) ORDER BY S.AGE
```

☐ Profiling [\[Edit inline\]](#) [\[Edit\]](#) [\[Explain SQL\]](#) [\[Create PHP code\]](#) [\[Refresh\]](#)

☐ Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

	AGE	LEVEL
<input type="checkbox"/> <a href="#">Edit</a> <a href="#">Copy</a> <a href="#">Delete</a>	19	Jr
<input type="checkbox"/> <a href="#">Edit</a> <a href="#">Copy</a> <a href="#">Delete</a>	20	Sr
<input type="checkbox"/> <a href="#">Edit</a> <a href="#">Copy</a> <a href="#">Delete</a>	21	Sr