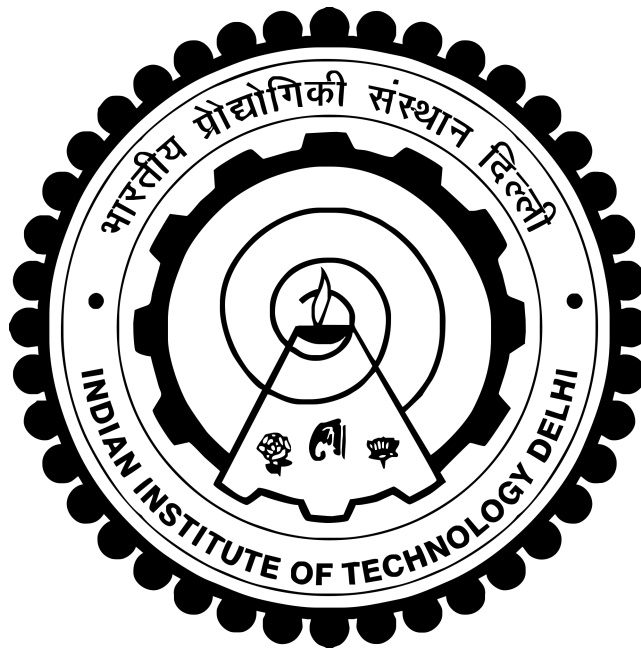


ELP718 Telecom Software Laboratory
1st Semester, 2016-18
Abhishek Mishra
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Assignment-12



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0.1 Introduction

This assignment aims to provide a better understanding of the following topics:

1. **Lex**

Lex helps write programs whose control flow is directed by instances of regular expressions in the input stream. It is well suited for editor-script type transformations and for segmenting input in preparation for a parsing routine.

Lex source is a table of regular expressions and corresponding program fragments. The table is translated to a program which reads an input stream, copying it to an output stream and partitioning the input into strings which match the given expressions. As each such string is recognized the corresponding program fragment is executed. The recognition of the expressions is performed by a deterministic finite automaton generated by Lex. The program fragments written by the user are executed in the order in which the corresponding regular expressions occur in the input stream.

2. **Yacc**

Computer program input generally has some structure; in fact, every computer program that does input can be thought of as defining an “input language” which it accepts. An input language may be as complex as a programming language, or as simple as a sequence of numbers. Unfortunately, usual input facilities are limited, difficult to use, and often are lax about checking their inputs for validity.

Yacc provides a general tool for describing the input to a computer program. The Yacc user specifies the structures of his input, together with code to be invoked as each such structure is recognized. Yacc turns such a specification into a subroutine that handles the input process; frequently, it is convenient and appropriate to have most of the flow of control in the user’s application handled by this subroutine.

0.2 Problem Statement

Design a Database system for Bharti School which holds the details of the Student, Courses being float and the Students enrolled in those Courses.

The Relational tables required for this task are:

```
Student(Stu_id, Name, Gender);  
Course(Course_id, Coursename, Instructor);  
Enroll(Stu_id, Course_id);  
Grades(Stu_id, Course_id, Grade);
```

0.2.1 Assumptions

The number of Courses being float are 8 only which are Signal Theory, Telecom Software Lab, Computer Networks, Telecom Technologies, Telecom Management System, Braodband Communication, Coding Theory, Digital Communication.

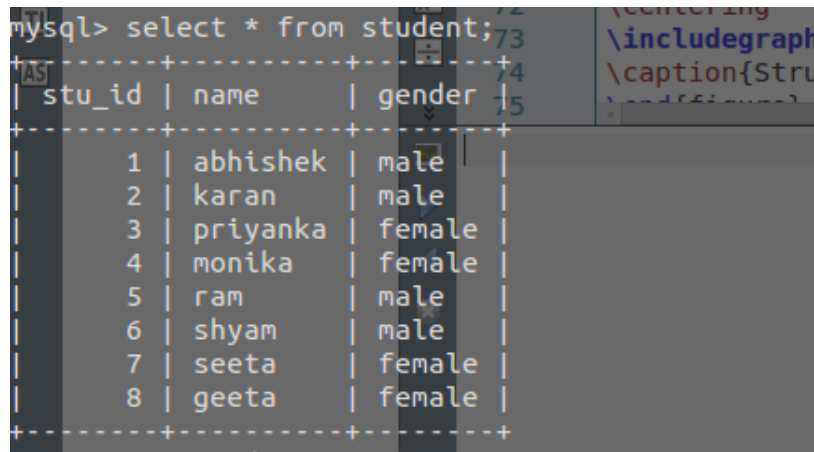
The Instructors are Prof. Subrat Kar, Prof. Ranjan Bose, Prof. Mahim Sagar, Prof. Shankar Prakriya. A Student is allowed to enroll in atmost 4 Courses.

There is atleast a student in a Course.

0.2.2 Part 1

Design Database for given system using MySQL i.e. create one database and the relational tables described above. Also write a python code to populate the tables.

The generated table looks like this:



```
mysql> select * from student;
```

stu_id	name	gender
1	abhishek	male
2	karan	male
3	priyanka	female
4	monika	female
5	ram	male
6	shyam	male
7	seeta	female
8	geeta	female

Figure 1: Table Student

```
mysql> select * from course;
```

course_id	course_name	instructor
1	Signal Theory	Mahim Sagar
2	Telecom Software Lab	Subrat Kar
3	Computer Networks	Ranjana Bose
4	Broadband Communication	Mahim Sagar
5	Coding Theory	Ranjana Bose
6	Digital Communication	Shankar Prakriya
7	Telecom Technology	Subrat Kar
8	Telecom Management Systems	Shankar Prakriya

3 rows in set (0.00 sec)

Figure 2: Table Course

```
mysql> select * from enroll;
```

stu_id	course_id				
1	1	LABELS		68	\c
1	1	BLOCKS		69	\e
1	2	Introduction		70	\p
1	3	Problem Statement		71	\b
1	4	Assumptions		72	\c
2	5	Part 1		73	\i
2	6	Structure Chart		74	\c
2	7	Screenshots		75	\e
3	8	Problem Statement		76	\p
3	1	Assumptions		77	\b
3	2	Structure Chart		78	\c
3	4	Epilogue		79	\i
4	5	biblio		80	\c
4	6			81	\e
4	7			82	\p
4	8			83	\s
5	1			84	\b
5	2			85	\c
5	3			86	\i
5	4			87	\c
6	5			88	\e
6	6			89	\p
6	7			90	\s
6	8			91	\b
7	1			92	
7	2				
7	3				
7	4				
8	5				
8	6				
8	7				
8	8				

Figure 3: Table Enroll

mysql> select * from grades;

id	stu_id	course_id	grade	
1	1	1	69	
2	1	2	70	
3	1	3	71	
4	1	4	72	
5	2	5	73	
6	2	6	74	
7	2	7	75	
8	2	8	76	
9	3	1	77	
10	3	2	78	
11	3	3	79	
12	3	4	80	
13	4	5	81	
14	4	6	82	
15	4	7	83	
16	4	8	84	
17	5	1	85	
18	5	2	86	
19	5	3	87	
20	5	4	88	
21	6	5	89	
22	6	6	90	
23	6	7	91	
24	6	8	92	
25	7	1		
26	7	2		
27	7	3		
28	7	4		
29	8	5		
30	8	6		
31	8	7		
32	8	8		

Figure 4: Table Grades

0.2.3 Part 2

Write SQL query to find the names of those students who have enroll in both Coding theory and Telecom Management system.

0.2.4 Part 3

Write SQL query to find the names of those Students who have Scored an A in atleast one of the Subject taught by Prof. Subrat Kar.

0.2.5 Part 4

Write SQL query to find average grade for each of the course.

0.2.6 Part 5

Write SQL query to find the names of girl student who have topped in the course along with the course name.

0.2.7 Structure Chart

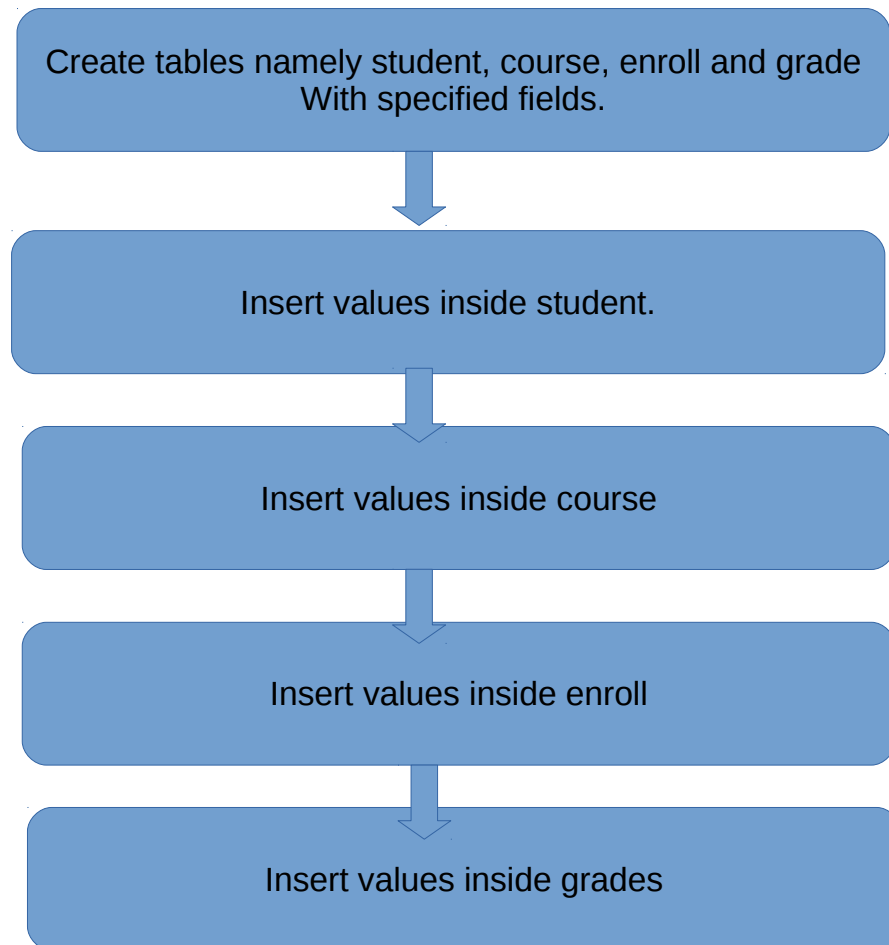


Figure 5: Structure chart for Part 1

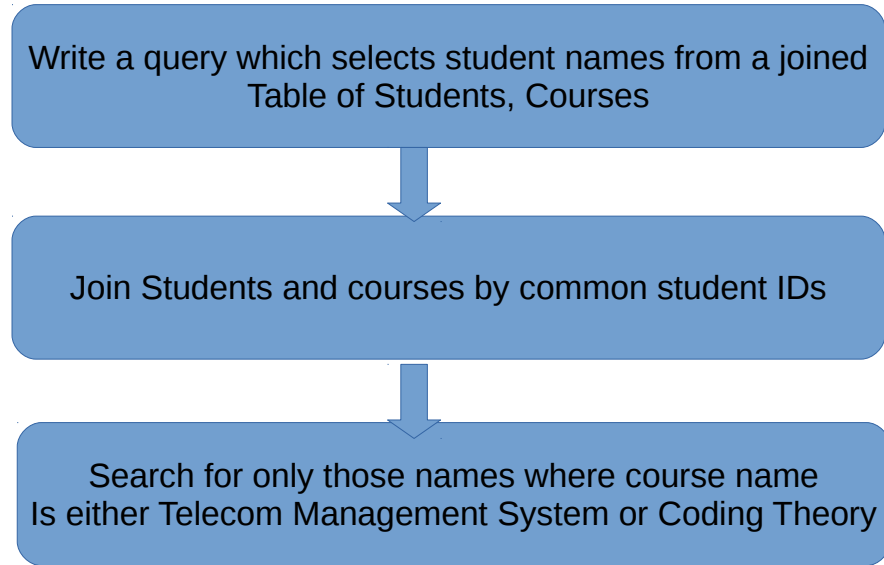


Figure 6: Structure chart for Part 2

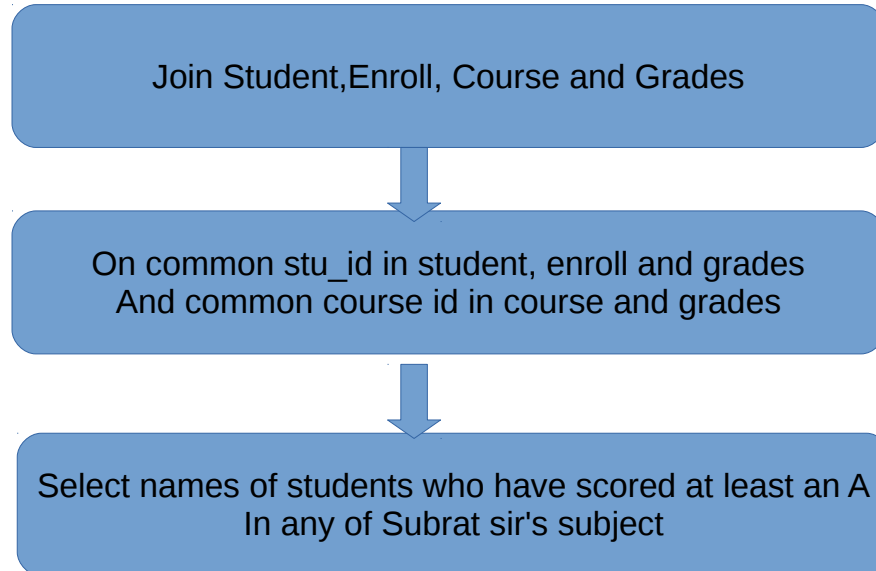


Figure 7: Structure chart for Part 3

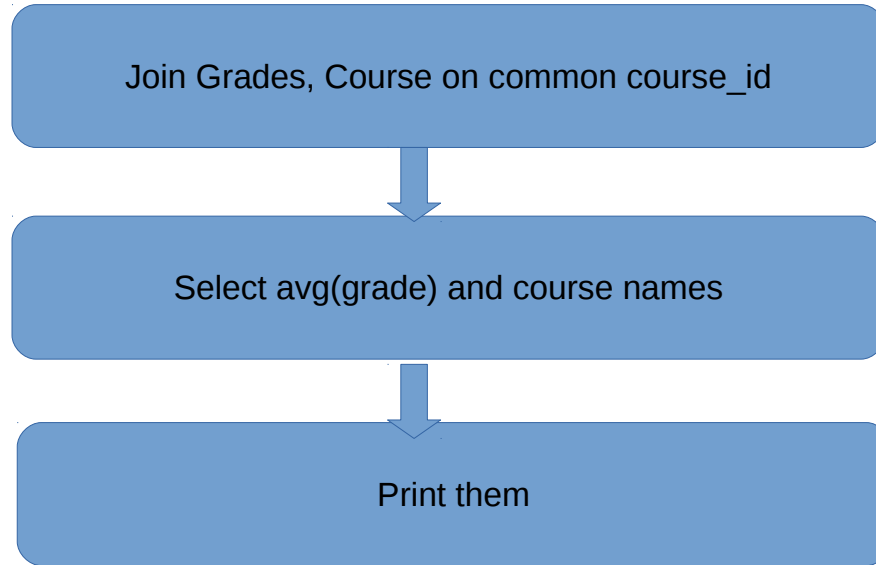


Figure 8: Structure chart for Part 4

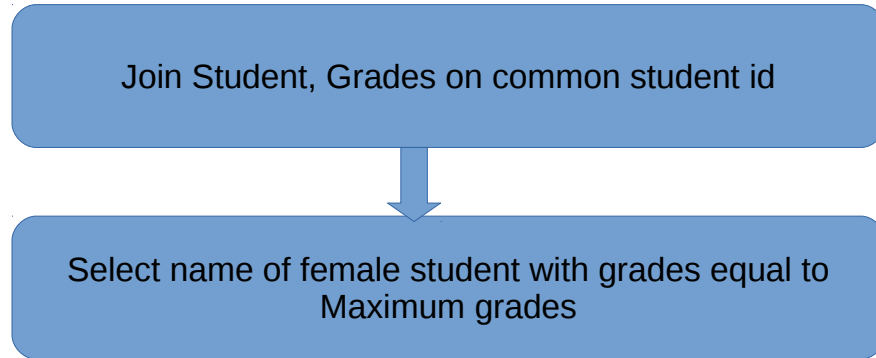


Figure 9: Structure chart for Part 5

0.2.8 Screenshots

```
sql = """create table student(
    stu_id int NOT NULL auto_increment,
    name varchar(30),
    gender ENUM('male', 'female'),
    primary key(stu_id) )"""

cur.execute(sql)

sql="DROP TABLE IF EXISTS course"
cur.execute(sql)
sql = """create table course(
    course_id int NOT NULL auto_increment,
    course_name varchar(30),
    instructor varchar(30),
    primary key(course_id) )"""

cur.execute(sql)

sql="DROP TABLE IF EXISTS enroll"
cur.execute(sql)
sql = """create table enroll(
    stu_id int NOT NULL,
    course_id int NOT NULL)"""

cur.execute(sql)
```

Figure 10: Screenshot for part 1

```
Connected to database.  
Subject takers  
karan  
monika  
shyam  
geeta
```

Figure 11: Screenshot for part 2

Connected to database.

A scorers

karan

priyanka

ram

seeta

Figure 12: Screenshot for part 3

Connected to database.

Average marks course wise

Signal Theory 8.25

Telecom Software Lab 6.00

Computer Networks 6.00

Broadband Communication 5.75

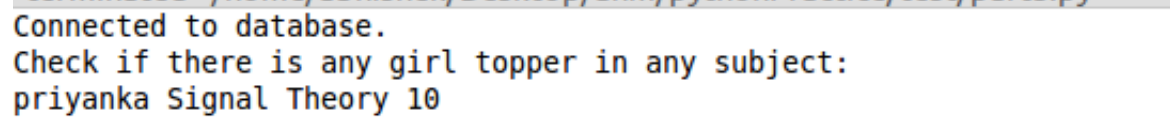
Coding Theory 6.50

Digital Communication 8.25

Telecom Technology 6.25

Telecom Management Systems 5.00

Figure 13: Screenshot for part 4



```
Connected to database.  
Check if there is any girl topper in any subject:  
priyanka Signal Theory 10
```

Figure 14: Screenshot for part 5

0.3 Epilogue

This week's assignment tested our database management skills and our ability to form basic RDBMS relations and using them to execute our required tasks.

Bibliography

- [1] “tutorialspoint.com.” <http://www.tutorialspoint.com/python>.
- [2] “tutorialspoint.com.” <http://www.tutorialspoint.com/mysql>.