# College-database management-system

# Project report

# Date:30-04-2017.

# Group members:

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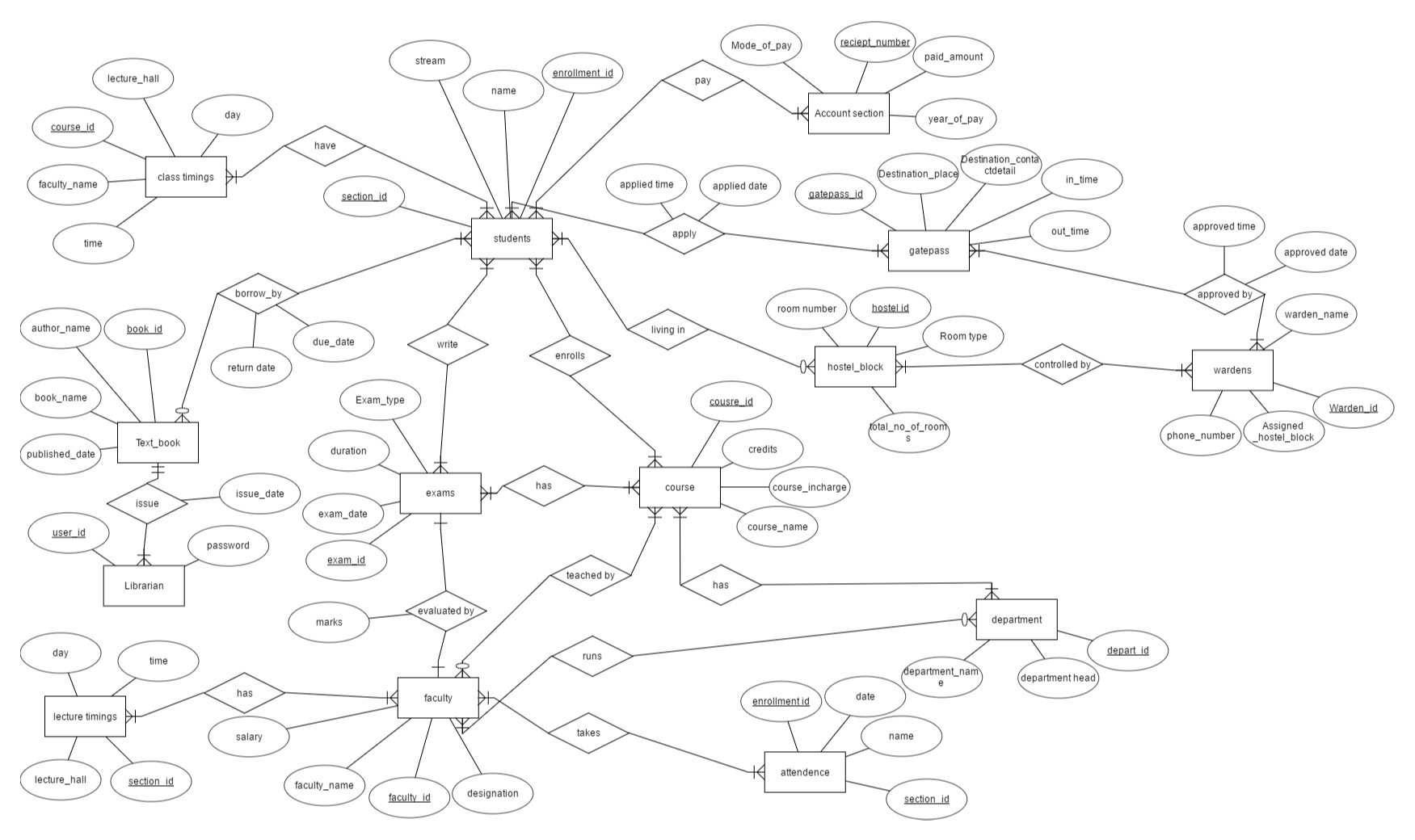
1. **Chapala sai sowmya(U101115FCS076)**

**Section:S3.**

**Problem statemen**

All the students in the college, go to the library, and the college has only one library,the attributes of the library are book\_id,book\_name,issue\_date.So, the relation is many-one. In the same case, all the students of the college are enrolled in courses, and the condition here is each student should get enrolled in a min. Of 6 courses each. So, here the relation is many to many.Faculty has a time-table, which has the attributes course\_id, faculty\_name,room,day\_and\_time, in the same case,students also have a timings,this relation is many to many, while in case of a consideration of a single section it is a one to one relation.Students borrow textbooks from one library, in this case the relation b/w textbooks and students is many to many, in case of librarian to textbooks is one to many.students take up exams, and faculty conducts exams, the relation b/w exams and students and faculty and exams is many to many in both.faculty teaches courses, the relation is many to many.each faculty is associated to a department, that is many to many,faculty should be compulsorily associated to a department,which is total participation.faculty takes up attendance, so the relation is many to many, as there are many classes.it is also a compulsory total participation.Students are living in hostel, hostels are controlled by many wardens so they are many to many between hostels and wardens, and the students living in hostel is an optional choice.Students apply for gate\_pass, and wardens approve them, so the relation is many to many, which is a compulsory participation.

# E-rdiagram:



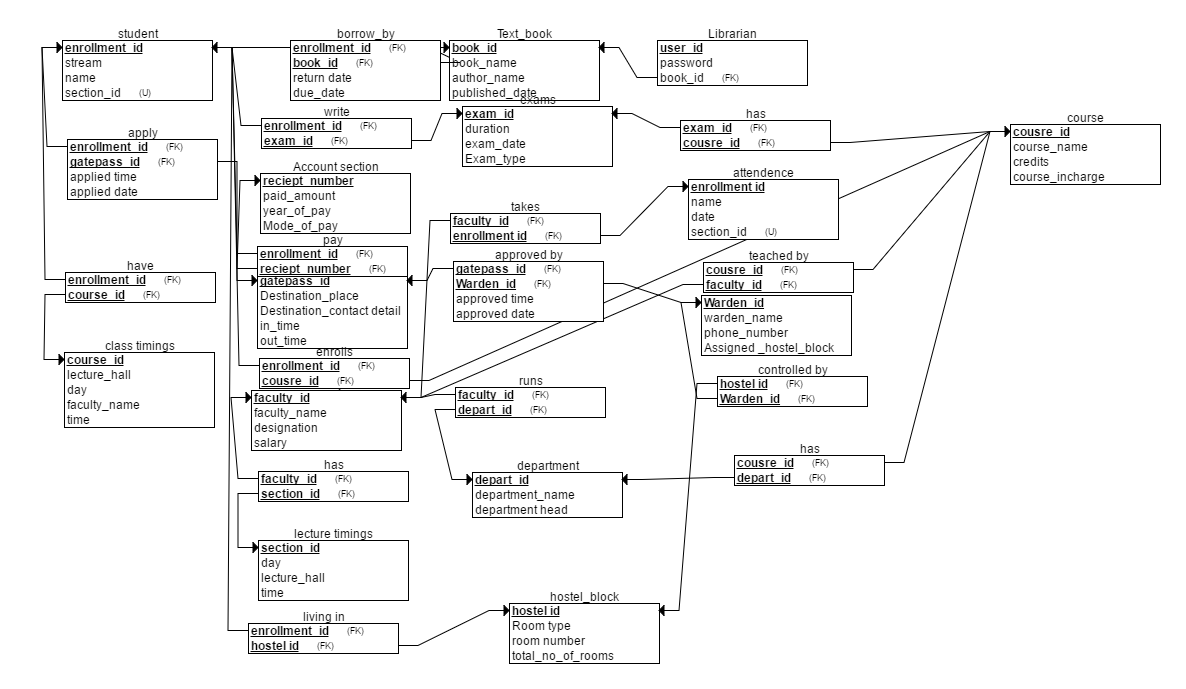
Relational schema:

Table schema:-converting er diagram to relational

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Entity | | Description | Sql syntax |  |
| students | | It contains students details | Create students(name varchar(30),section\_id varchar(20),stream varchar(20),enrollment\_id varchar(30),primary key(enrollment\_id)); |  |
| Class\_timings | | It contains the class timings of the student | Create class\_timings(facultyname varchar(30),time int(10),course\_id varchar(20),lecture\_hall varchar(30),day varchar(20),primary key(course\_id)); |  |
| Text\_book | | It contains the details of the subject. | Create text\_book(book\_idvarchar(30),author\_name varchar(30),book\_name varchar(30),published\_date int(10)primary key(book\_id)); |  |
| exams | | It has details of the exam types of the exams | Create exams(examtype varchar(30),duration int(30),exam\_date int(30),exam\_id varchar(30),primary key(exam\_id)); |  |
| Librarian | | It has details of the librarian | Create librarian(user\_id varchar(30),password varchar(30),primary key(user\_id)); |  |
| course | | Course details,credits,course in-charge, etc, | Create course(course\_id varchar(30),credits int(10),course\_in-charge varchar(40),course\_name varchar(30),primary key(course\_id)); |  |
| Gatepass | | It has details of the outgoing and incoming of the students in the campus | Create gatepass(gatepass\_id varchar(30),destination\_place varchar(30),destination\_contact\_detail int(10), in\_time int(10),out\_time int(10),primary key(gatepass\_id)); |  |
| hostelblock | | It has details of the hostel and details | Ceate hostels(room\_no int(10),HOSTEL\_ID varchar(10),room\_type varchar(10),primary key(hostel\_id)); |  |
| Account section | | Details of the fee and accounts | Create account\_section(mode\_of\_pay(varchar(10),receipt\_no varchar(20),paid\_amount int(10),year\_of\_pay int(10),primary key(receipt\_no.)); |  |
| wardens | | Warden details | Create wardens(warden\_id varchar(20),phone\_no int(10),assigned\_hostel\_block varchar(10),warden\_name varchar(10),primary key(warden\_id)); |  |
| Department | | Details of the department | Create department(department\_id varchar(30),department\_name varchar(30),department\_head varchar(30),primary key(department\_id)); |  |
| faculty | | Details of the faculty | Create faculty(faculty\_id varchar(30),faculty\_name varchar(30),designation varchar(100),salary int(10),primary key(faculty\_id)); |  |
|  |
|  |
|  |
|  |

Normalization is done for all the tables to 3NF to BCNF and according to functional dependencies by decomposition.

2NF requirements:

All the attributes are must be functionally dependent on primary key.

3Nf requiremnets:

No attribute is transistively dependent on the primary key.

BCNF requiremnts:

CtudNF does not allow dependencies between attributes that belong to candidaeste keys.

BCNF is a refinement of the third normal form in which it drops the restriction of a non-key attribute from the 3rd normal form.

Student table:

Entities used:enrollment\_id,stream,name,section\_id.

The set of key attributes is={enrollment\_id}

FD’s used:Enrollment\_id->stream

Enrollment\_id->name

Enrollment\_id->section\_id

Name->section\_id

Name->stream

The table is in already 2NF because stream,name,section\_id are all dependent on enrollment\_id.

The table is not in 3NF because enrollment\_id,stream,section\_id are transistively dependent.

3NFdecomposition:

1. Move all items involved in transitive dependencies to a new entity.
2. Identify a primary key for new entity.so here section\_id become primary key.

So new student table is

New Students(section\_id,name,stream)

Primary\_key:name;

Original Students(enrollment\_id,name)

Primary key: enrollment\_id;

Foreign key: name;

The table is in BCNF Normalisation for new entities.

Here no need to decompose it.

Exam table:

Attributes used: exam type,duration,exam\_id,exam\_date

Primary key:exam\_id;

FD’s used: Exam\_id->exam type

Exam\_id->exam\_date

Exam\_id->duration

The table is already in 2NF,3NF and BCNF.

Courses table

Attributes used:course\_incharge,course\_name,credits,course\_id

Primary key:course\_id;

FD’s used:Course\_id->course\_name

Course\_id->course\_incharge

Course\_id->credits

Course\_name->course\_incharge

2NF: The entire table is dependent on course\_id(primary key)

3NF:The table is not in 3NF because course\_name and course\_incharge transistvely dependent.

so new courses table is

new courses(course\_name,couse\_incharge)

Primary key: course\_name;

Original courses(course\_name,credits,course\_id)

Primary key:course\_id;

Foreign \_key:course\_name;

Textbook table:

Attributes used:book\_id,author\_name,book\_name,published\_date

Primary key: book\_id;

F.D.’s used:

Book\_id->book\_name

Book\_id->author\_name

Book\_id->published\_date

Book\_name->author\_name

2NF: all attributes are functionally dependent on primary key.

3NF: since book\_name,author\_name are transistively dependent.

3NF decomposition:

New Textbook(book\_name,author\_name)

Primary key:book\_name

Textbook(book\_id,book\_name,published\_date)

Primary\_key:book\_id

Foreign \_key: book\_name

Now no attribute is transistively dependent.so it is in 3NF as well as BCNF.

Librarian table:

Attributes used: username,password.

Primary\_key:username

The table is in 2nF,3NF and BCNF.

Class timings table:

Attributes used: course\_id,faculty\_name,lecture\_hall,day,time

Primary key: course\_id;

FD’s used:Course\_id->faculty\_name

Course\_id->lecture\_hall

Faculty\_name,time,day>lecture\_hall

2NF:it is not in 2NF because all attributes are not dependent on primary key.

2NF decomposition:

New class timings table(course\_id,faculty\_name,lecture\_hall)

Primary key:faculty\_name

Foreign\_key:course\_id

Class timings(course\_id,day,time)

Primary key:course\_id;

So,now it is not in 3NF.

3NF decomposition:

New class\_timings(course\_id,faculty\_name,lecture\_hall)

Primary key:course\_id;

Foreign\_key:lecture\_hall;

Class\_timings(faculty\_name,day,time,lecture\_hall)

Primary key: lecture\_hall;

So it is not in BCNF.

New class\_timings(course\_id,faculty\_name,lecture\_hall)

Primary key:lecture\_hall;

Foreign\_key:course\_id;

Class\_timings(course\_id,day,time)

Primary\_key:course\_id;

Account\_section table (

mode\_of\_pay,receipt\_number, paid\_amount,year\_of\_pay,Primary key(recepit number);

F.D’s used:

Receipt number->mode\_of\_pay

Receipt\_number->paid\_amount

Receipt\_number->year\_of\_pay

The table is in already 2NF,3NF and BCNF.

Faculty table:

Attributes used:faculty\_name,faculty\_id,salary,designation

FD.s used:

Faculty\_id->faculty\_name

Faculty\_id->designation

Faculty\_id->salary

Faculty\_name->designation

2NF: The table is already in 2NF because all attributes are dependent on primary key.

3NF:

Faculty name,designation,Faculty\_id are transistively dependent.

3NF decomposition:

New Faculty(Faculty\_name,designation)

Primary key: Faculty\_name

Faculty(Faculty\_name,faculty\_id,salary)

Primary\_key:Faculty\_id

Foreign\_key:Faculty\_name;

So the table is in 3NF decomposition.

This is also called as BCNF decomposition.

lecture timings table

Attributes used:section\_id,lecture\_hall,day,time

Primary key:section\_id;

Fd.s used:

Section\_id->lecture\_hall

Section\_id,Day,time->lecture\_hall

2NF: No attribute is dependent on the primary key.

2NF decomposition:

New lecture timings table(sectioqnid, lecture hall);

Primary key: sectionid;

Lecture timings table(sectionid,day,time)

Foreign key: section id;

Primary key:day;

So now these are 2NF,BCNF and 3NF.

Department table:

Attributes used:(department\_name,department\_head,

department\_id)

Primary key:department\_id;

F.D’s used:

Department\_id->department\_head

Department\_id->department\_name

Department\_name->department\_head

2NF: The table is in 2NF because all attributes are dependent on the primary key.

3NF: The table is not in 3NF because Deaprtment\_name,department\_head are transistvely dependent.

3NF decomposition:

New department(department name,department head);

Primary key: Department name;

Department(department name,department\_id);

Foreign key: Department\_name;

Primary\_key:Department\_id;

Now the table is in 3NF and BCNF also.

Hostel block table:

Attributes used:Room\_number,hostel\_id,room\_type,

total\_no\_of rooms

Primary key:hostel\_id;

F.d.’s used:

Hostel\_id->total\_no\_of\_rooms

Hostel\_id->room\_type

Room\_number->room\_type

2NF: The table is in 2NF beacuse all attributes are dependent on hostel\_id;

The table is not in 3NF because room\_number,room\_type are transistively dependent.

3NF decomposition:

New hostel\_block(Room\_number,room\_type)

Primary key:Room\_number;

Hostel\_block(room\_number,total\_no\_of\_rooms,hostel\_id)

Primary\_key:hostel\_id;

Foreign\_key:room\_number;

Now this is 3NF and BCNF also.

Gatepass\_table:

Attributes used: Gatepass\_id,destination\_place,Destination\_contact\_detail,in\_time,out\_time

Functional dependencies:

Gatepass\_id->destination\_place

Gatepass\_id->destination\_contact\_detail

Gatepass\_id->in\_time

Gatepass\_id->out\_time

The table is in 2NF,3NF and BCNf also.

Wardens table:

Attributes used:Warden\_name,phone\_number,assigned\_hostel\_block,warden\_id)

F.d’s used:

Warden id->warden\_name

Warden\_id->assigned\_hostel\_block

Warden\_id->phone\_number

Warden\_name->assigned\_hostel\_block

Phone\_number->warden\_name

2NF: entire table is dependent on the primary key.

3NF: the table is not in 3 NF because warden name,assigned hostel block,phone number are transistively dependent.

3NF DECOMPOSITION:

New wardens(warden name,assigned\_hostel\_block)

Primary key:warden\_name;

Wardens2(phone number,warden name)

Primary key:phone number

Foreign\_key:warden\_name;

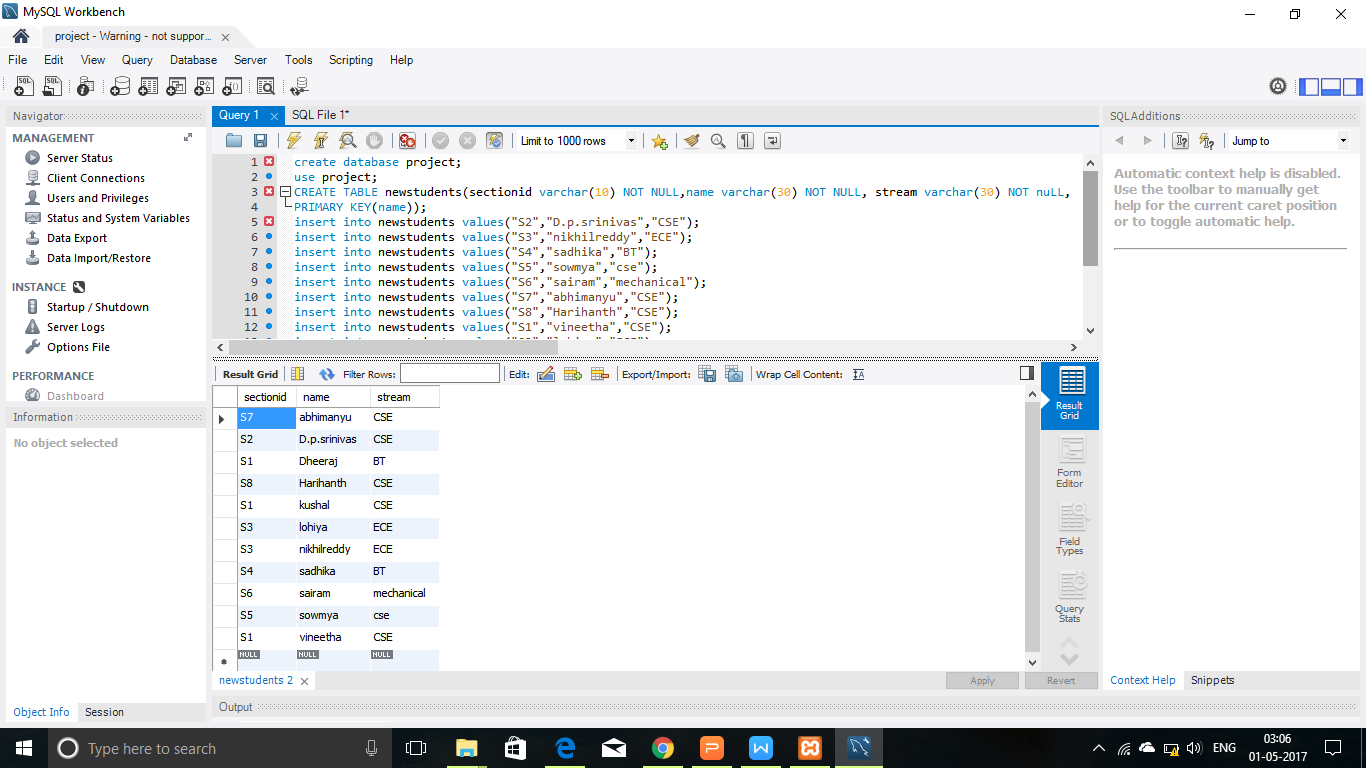
Wardens3(warden\_id,phone number)

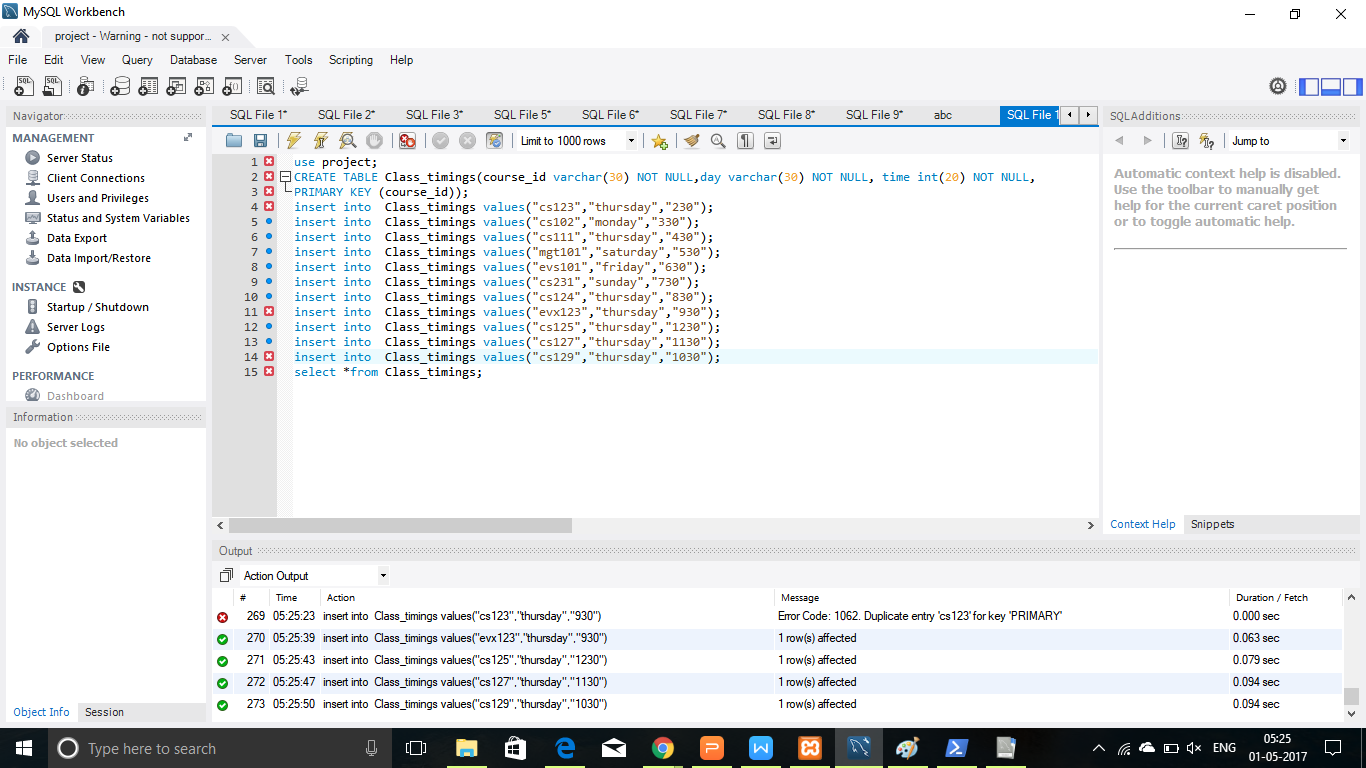
Primary key:warden\_id;

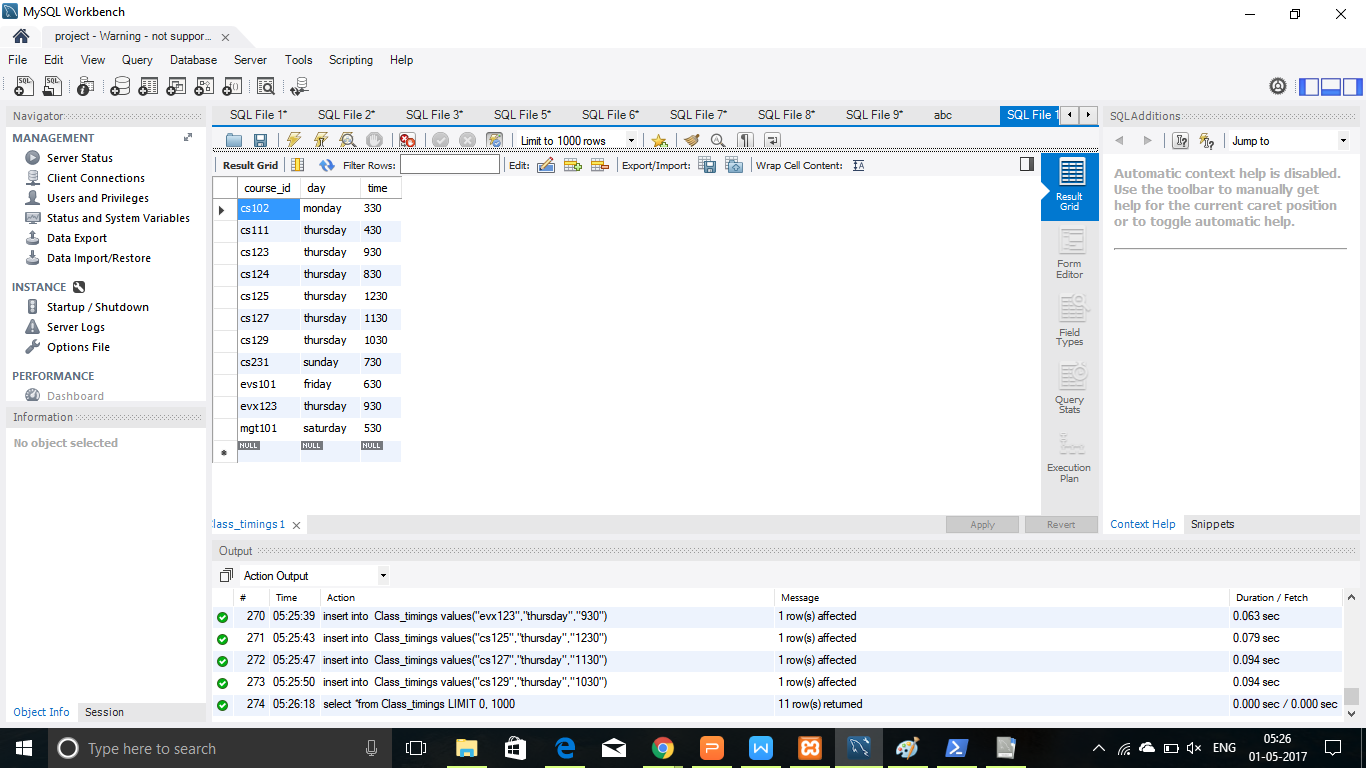
Foreign\_key:phone number;

SQl sample outputs:

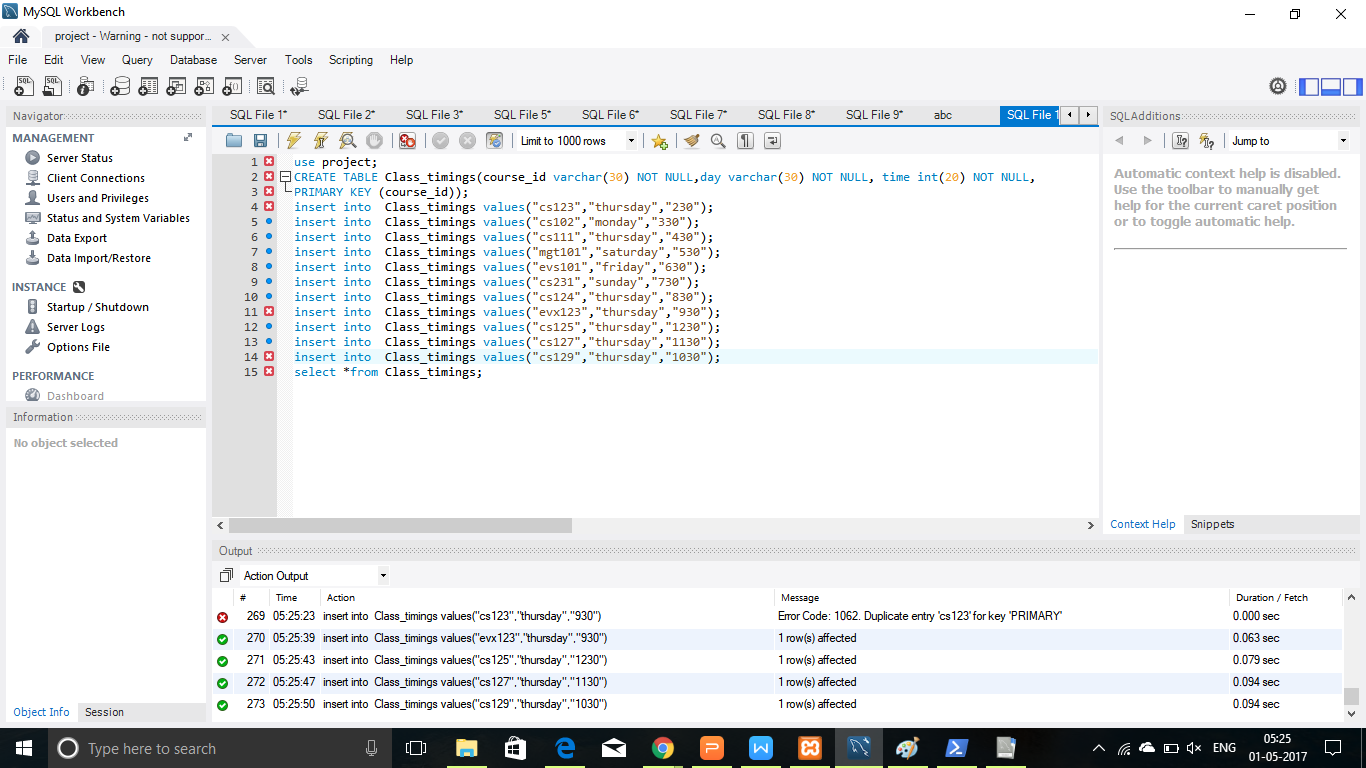
1. Table students



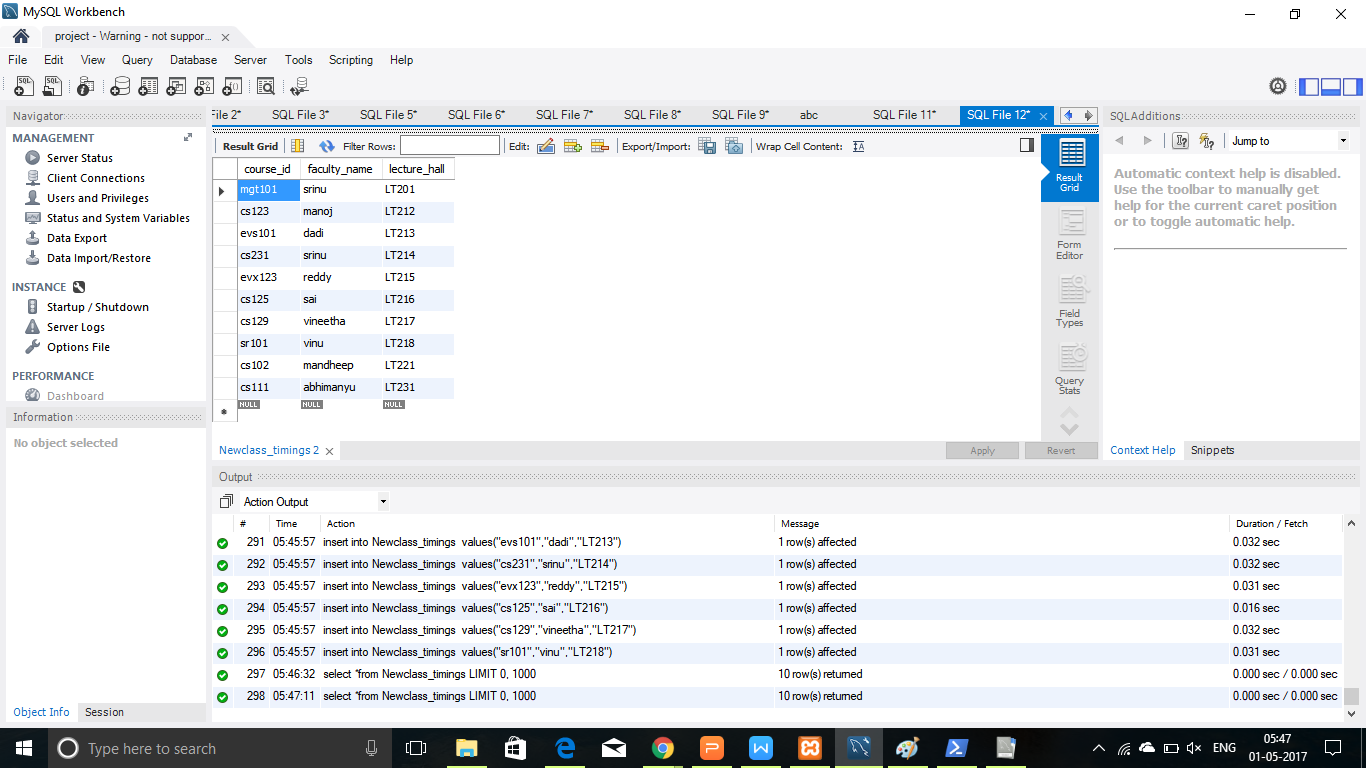
1. Table class\_timings
2. 

Output:

New class\_timings(course\_id,faculty\_name,lecture\_hall)

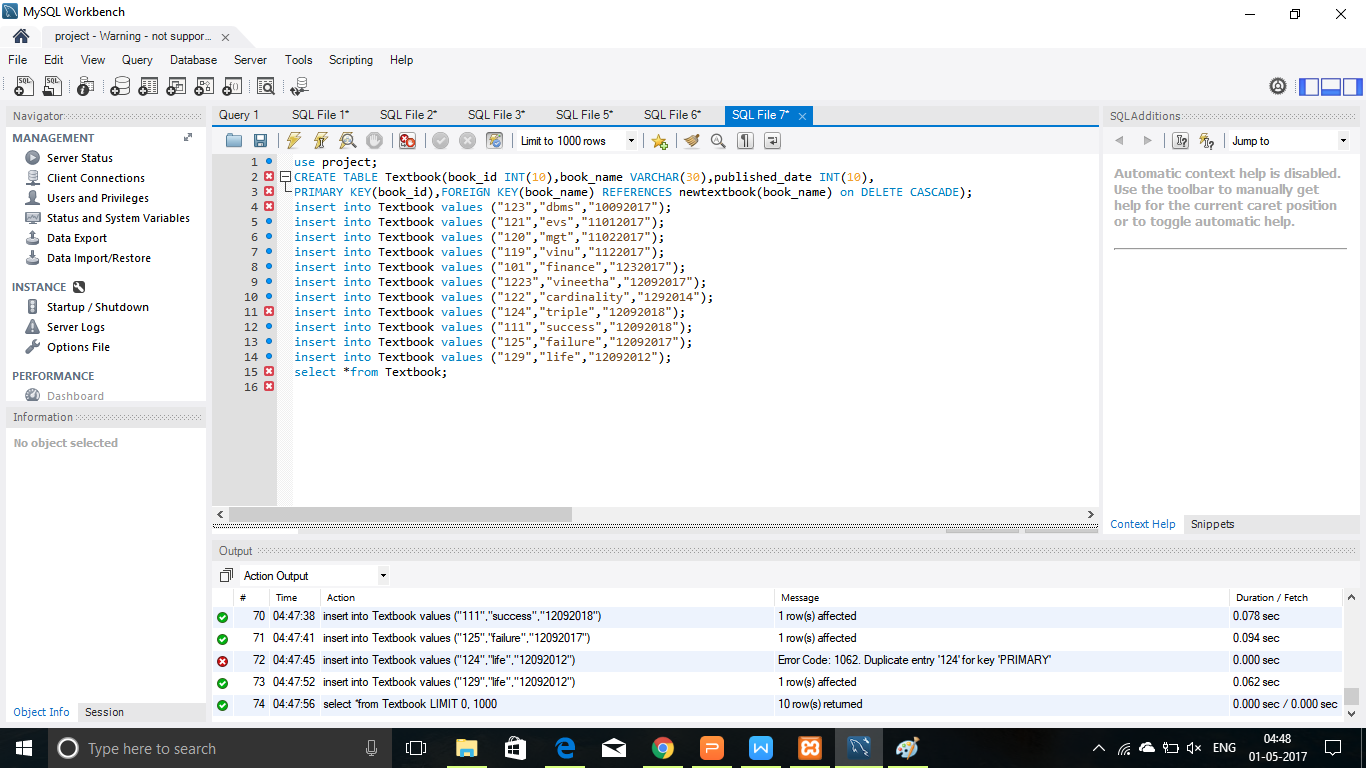


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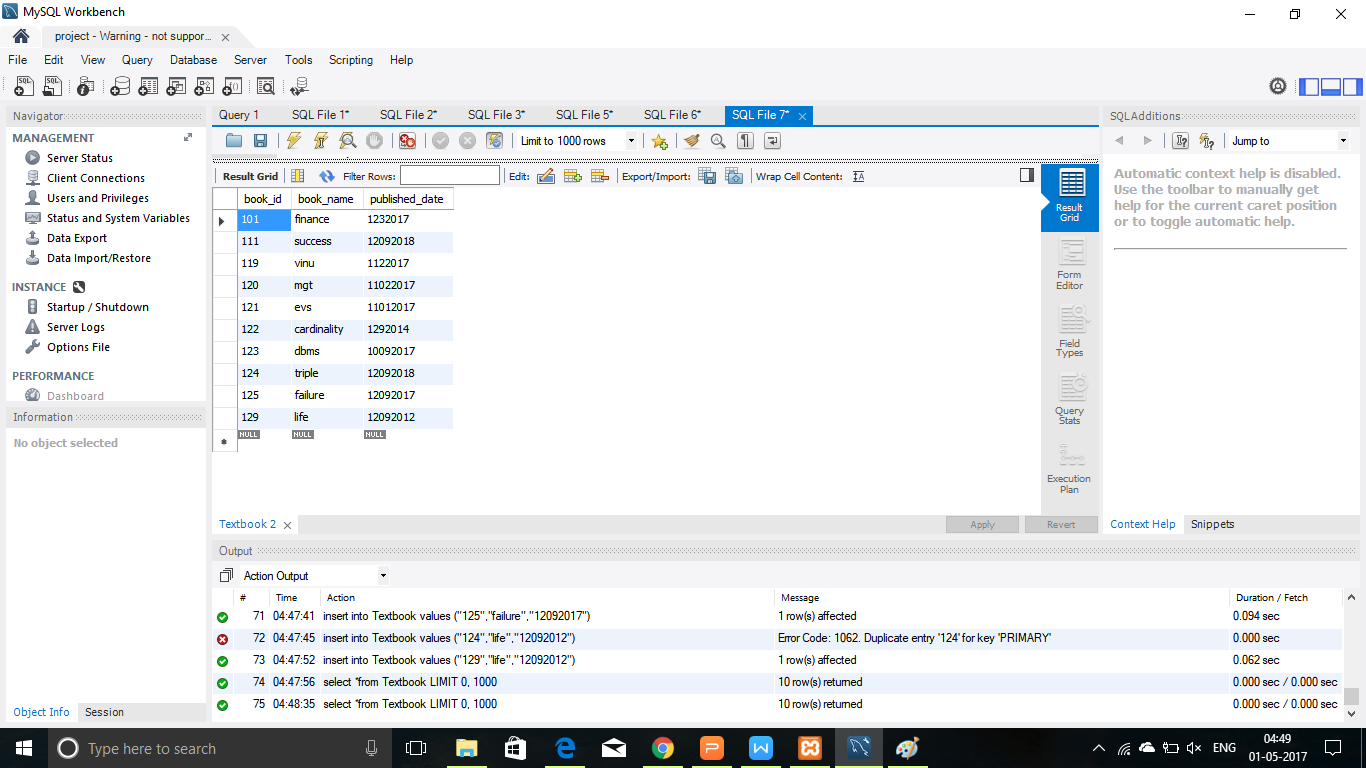


1. Table\_textbook

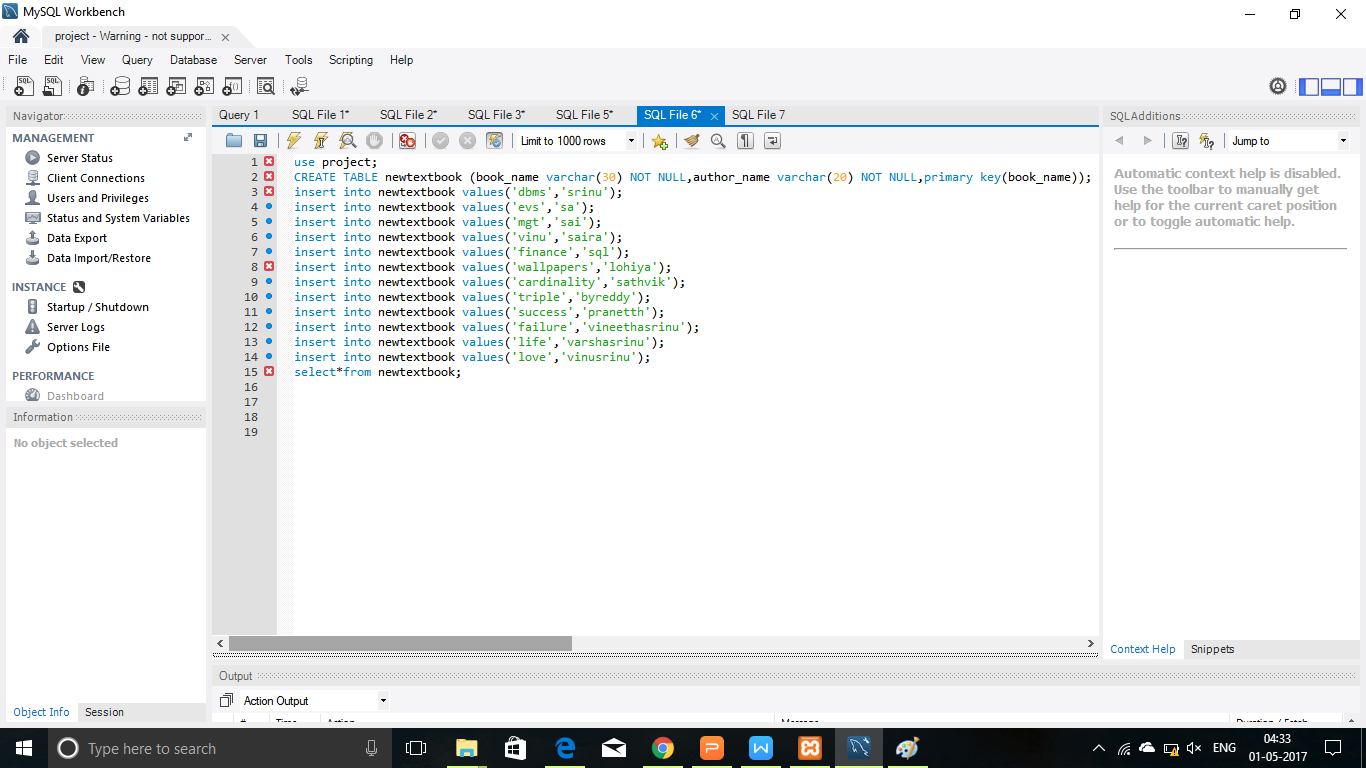
New Textbook(book\_name,author\_name)

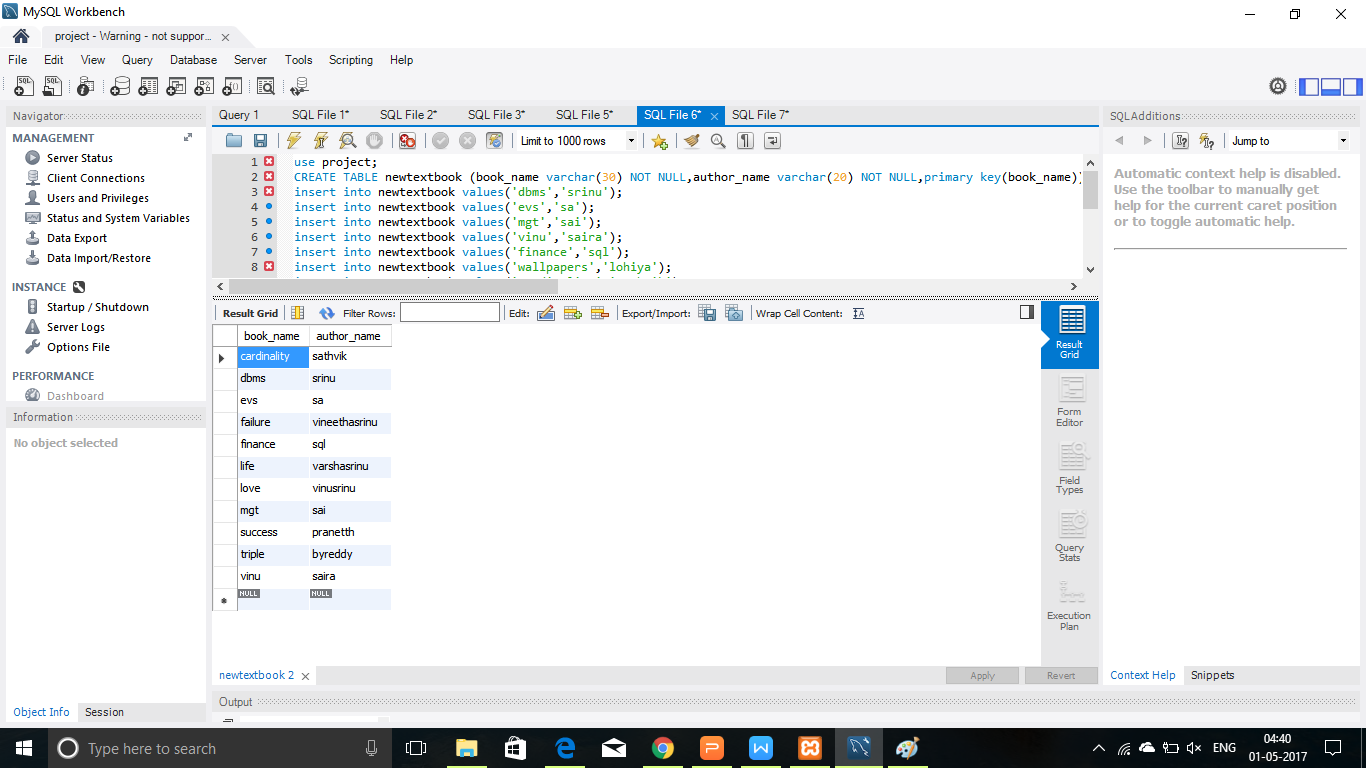


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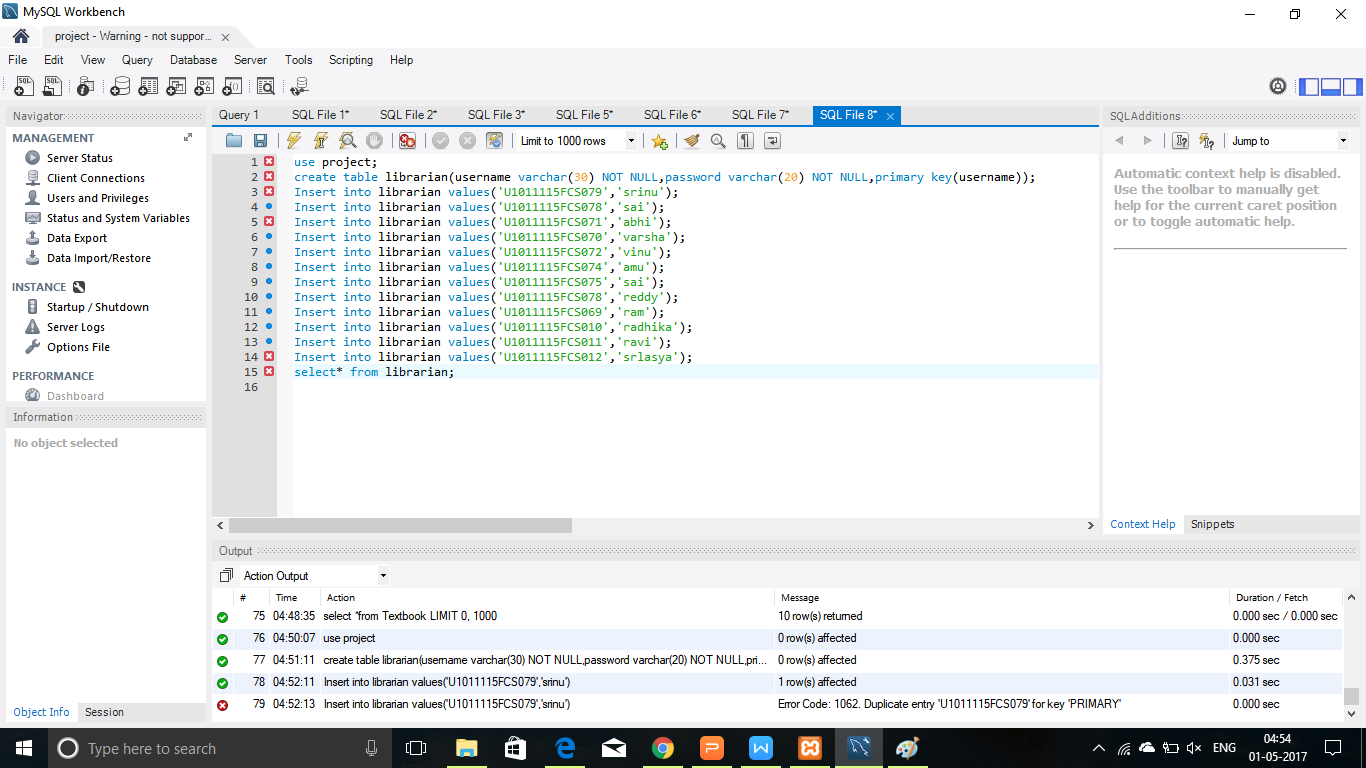


Textbook(book\_id,book\_name,published\_date)

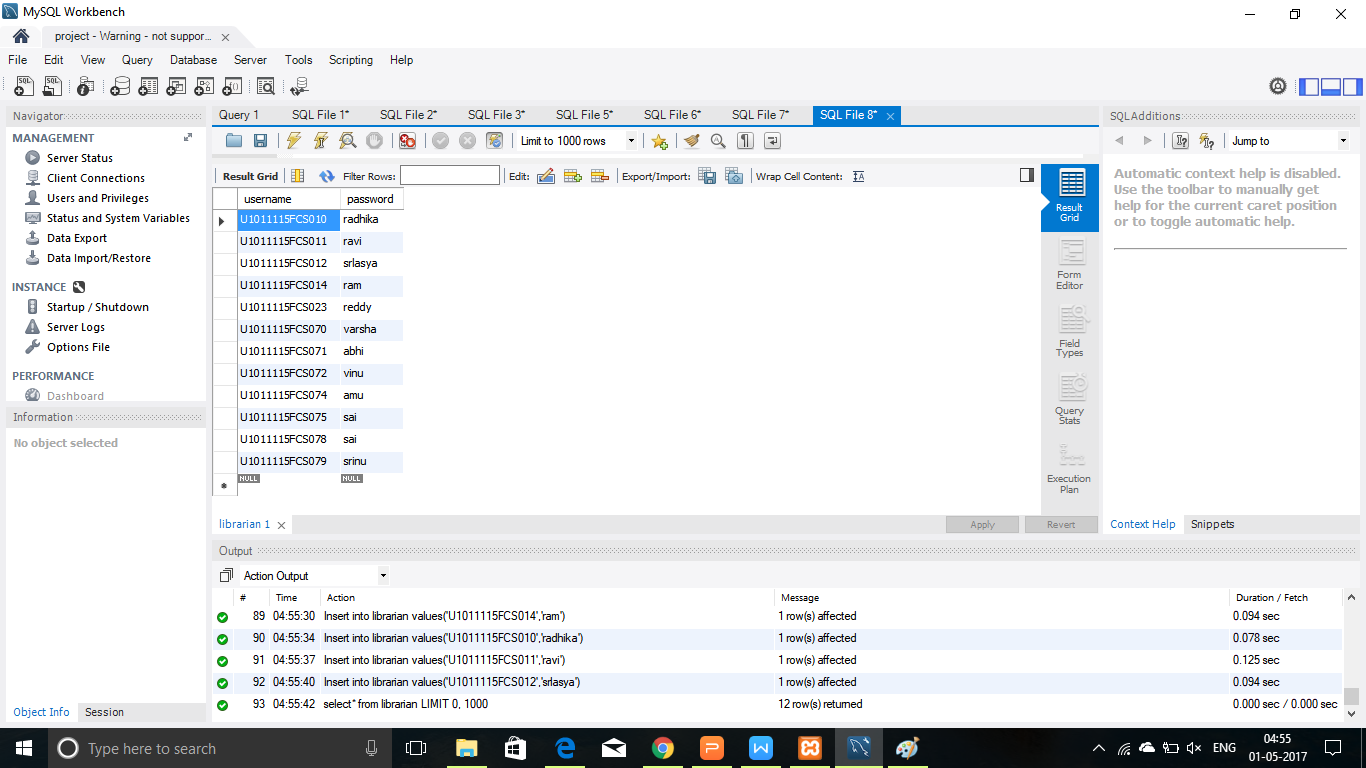


Output:

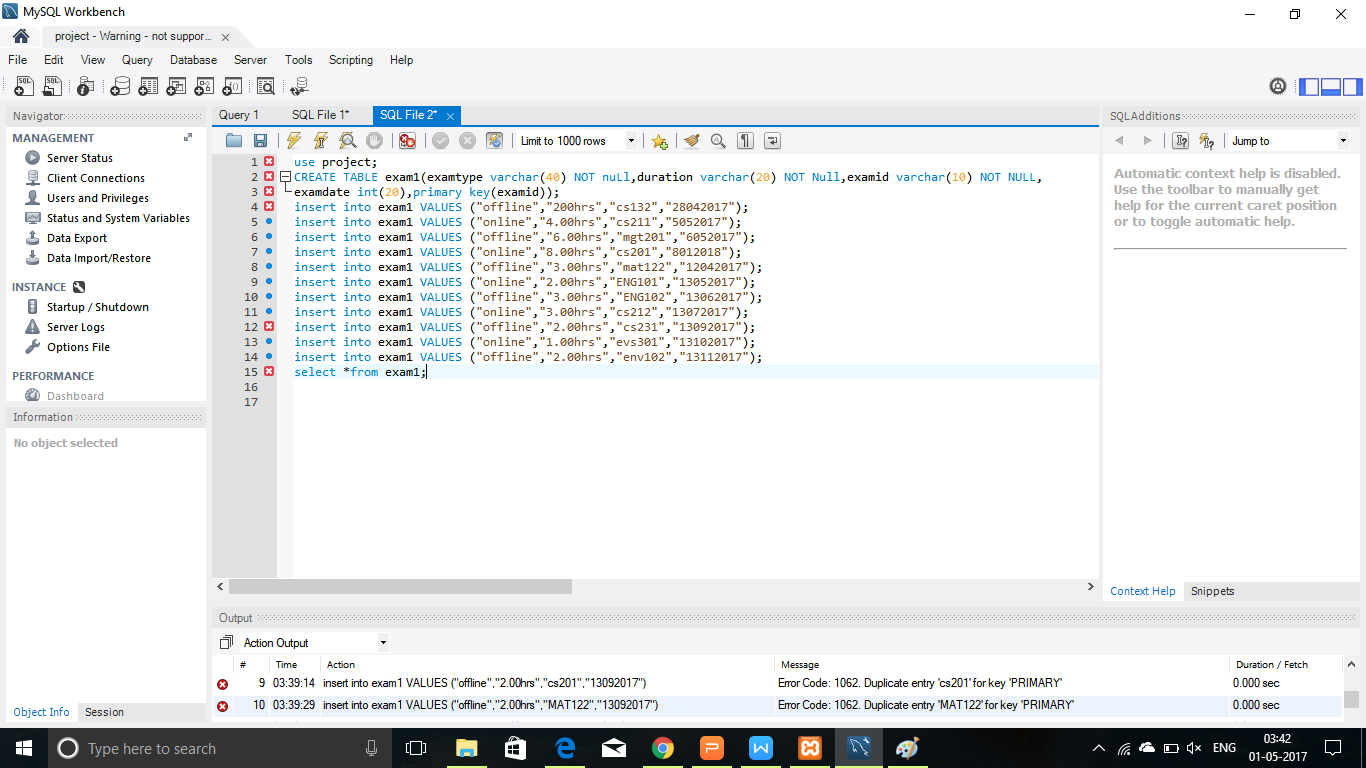
1. Table librarian



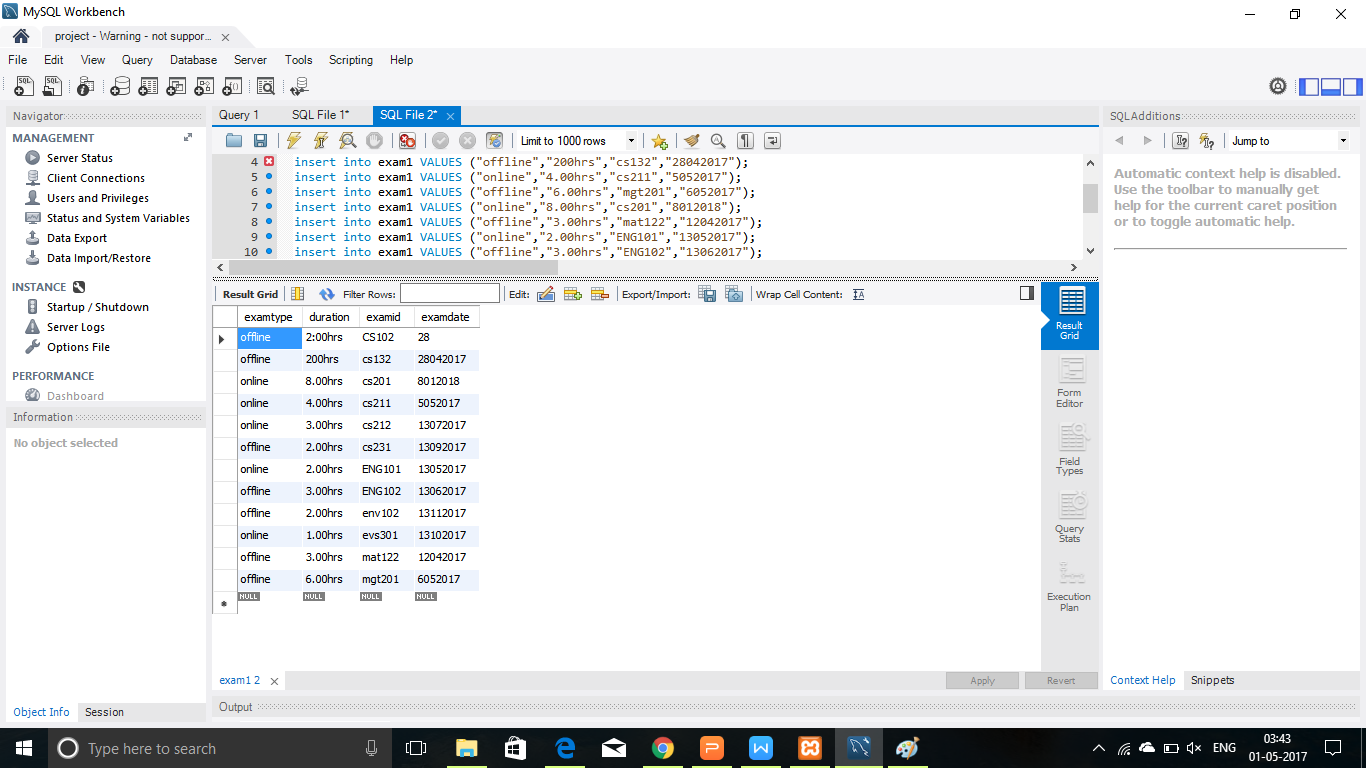
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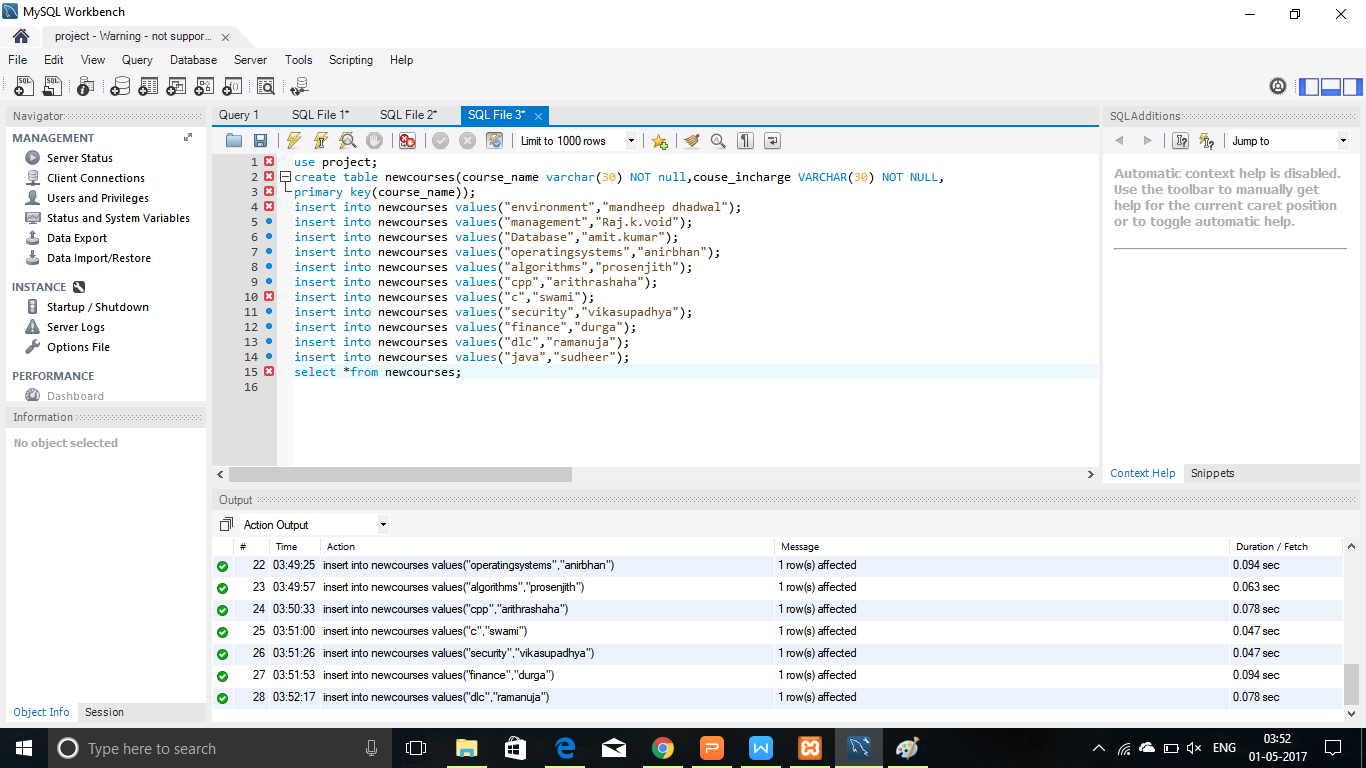
1. Table exams



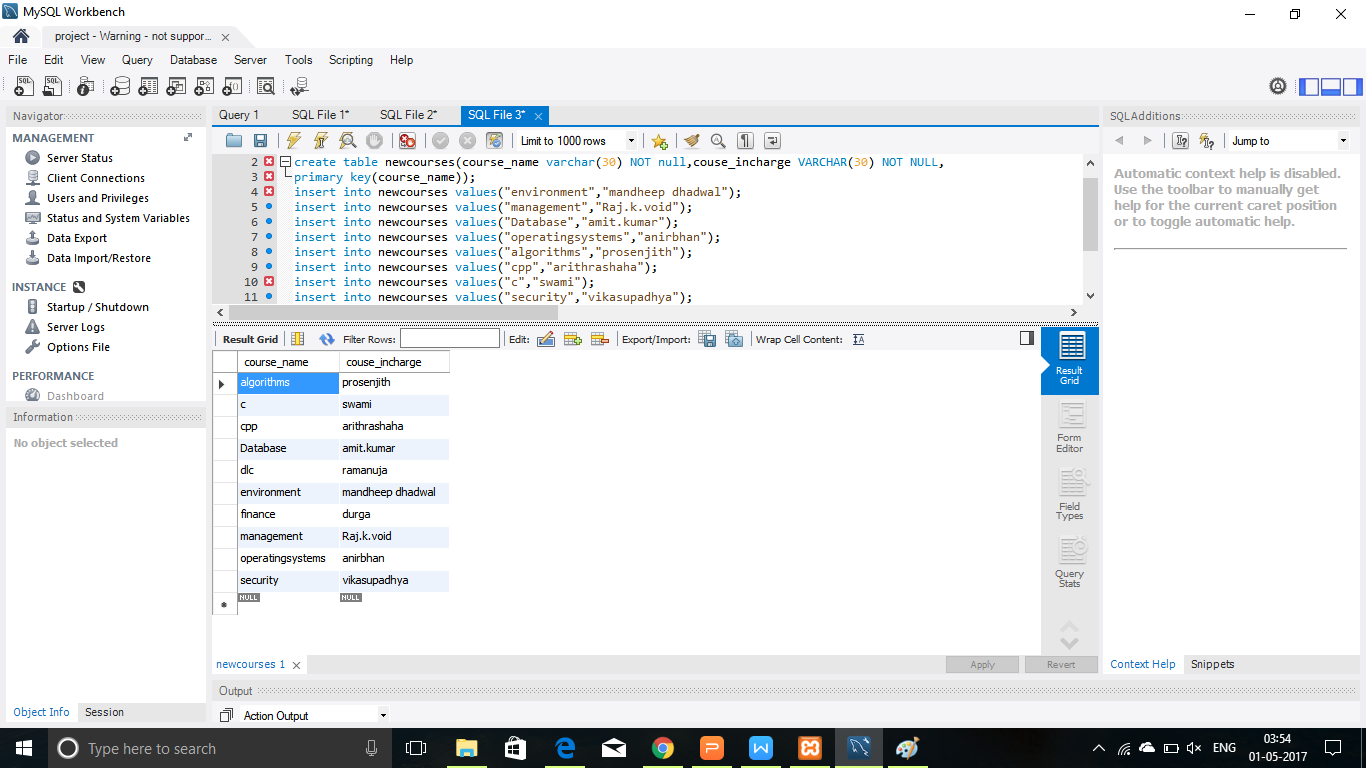
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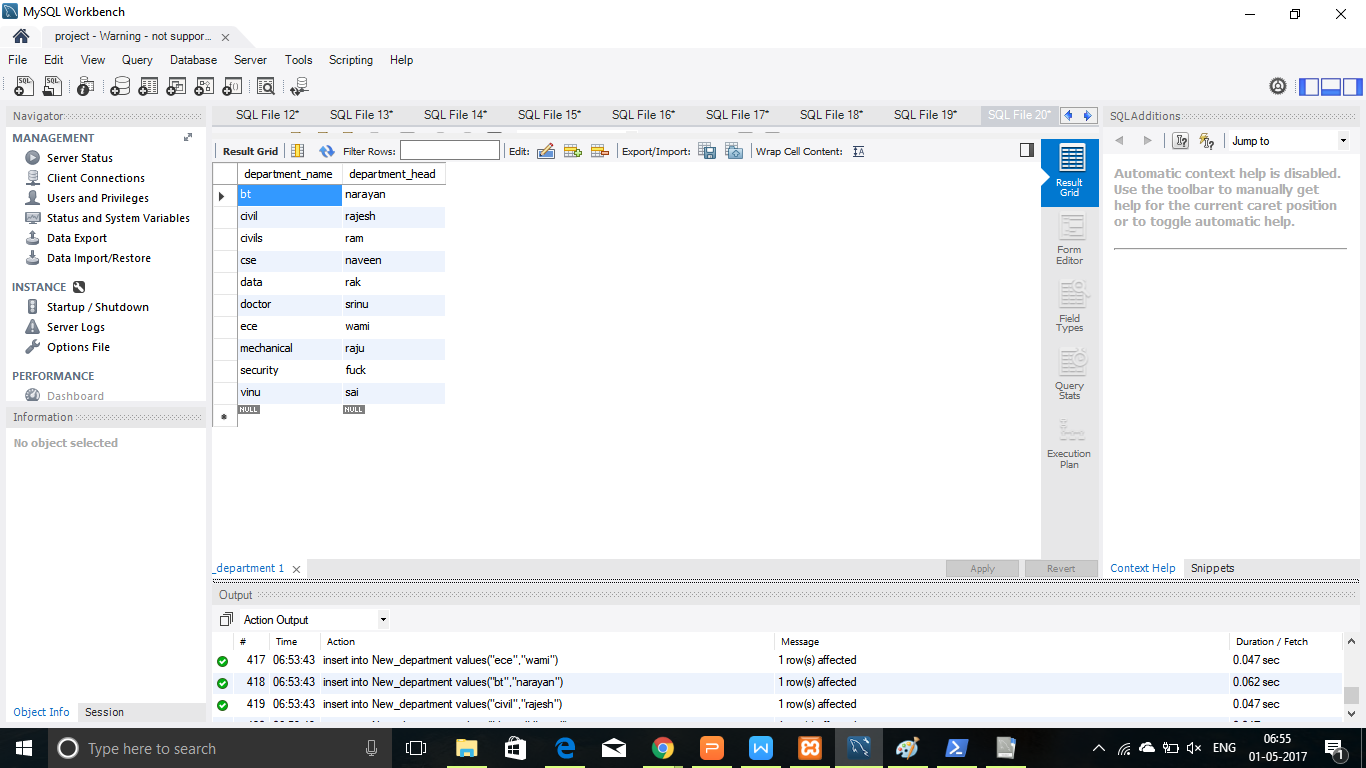
1. Table course



Output:

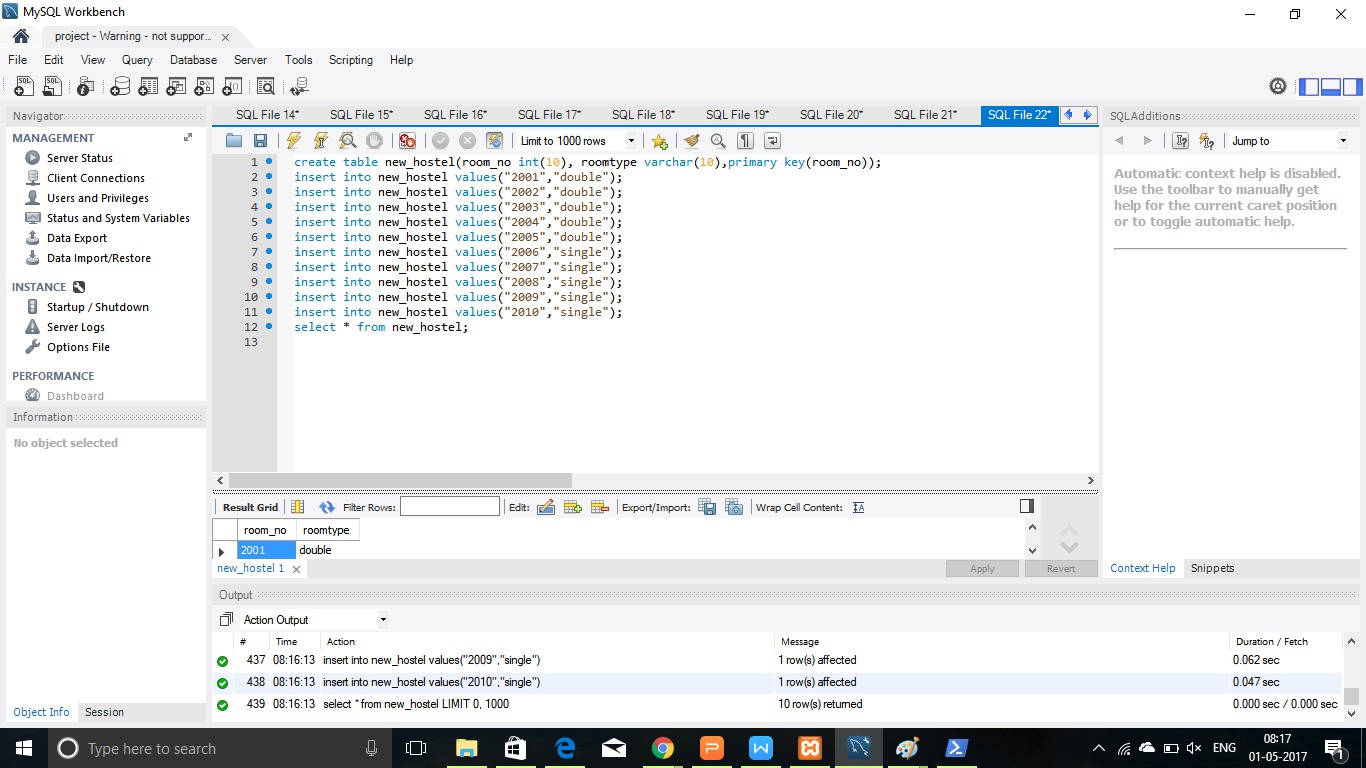


1. Table department

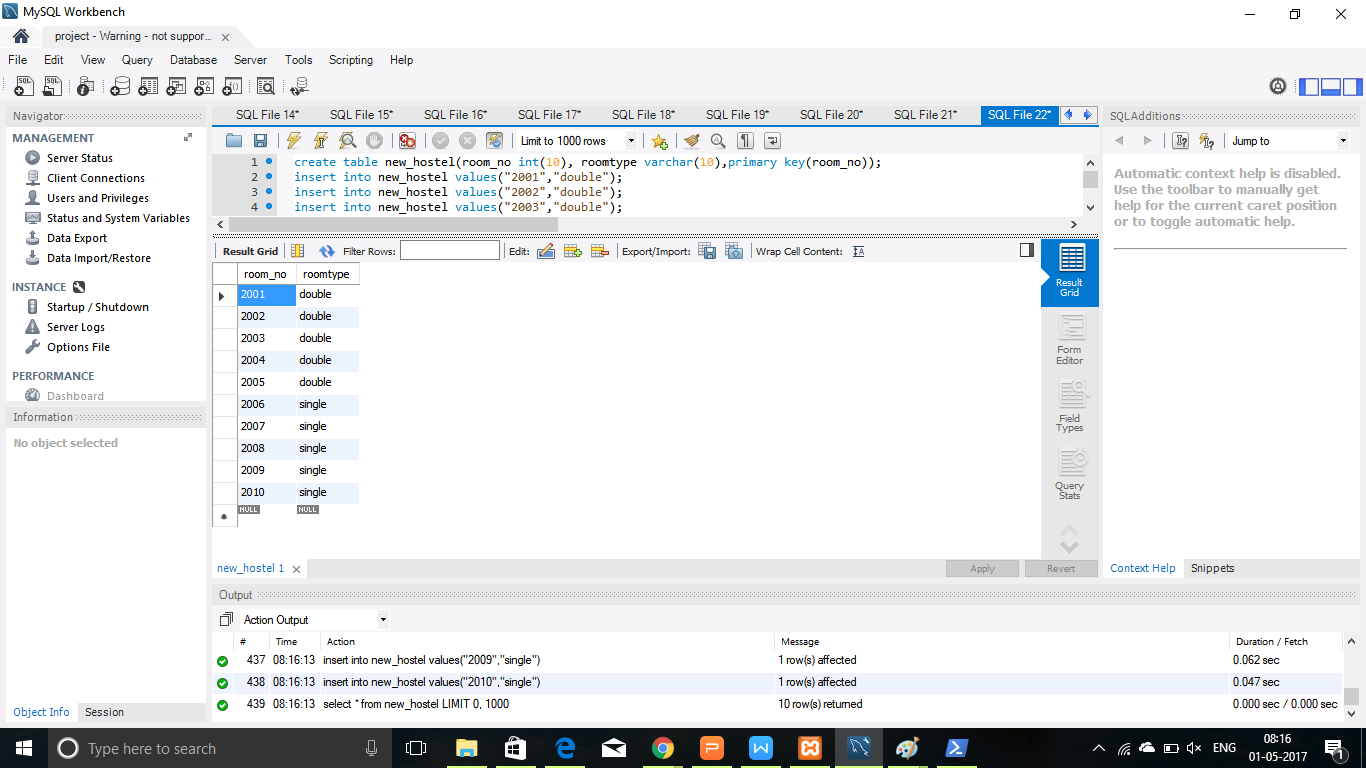


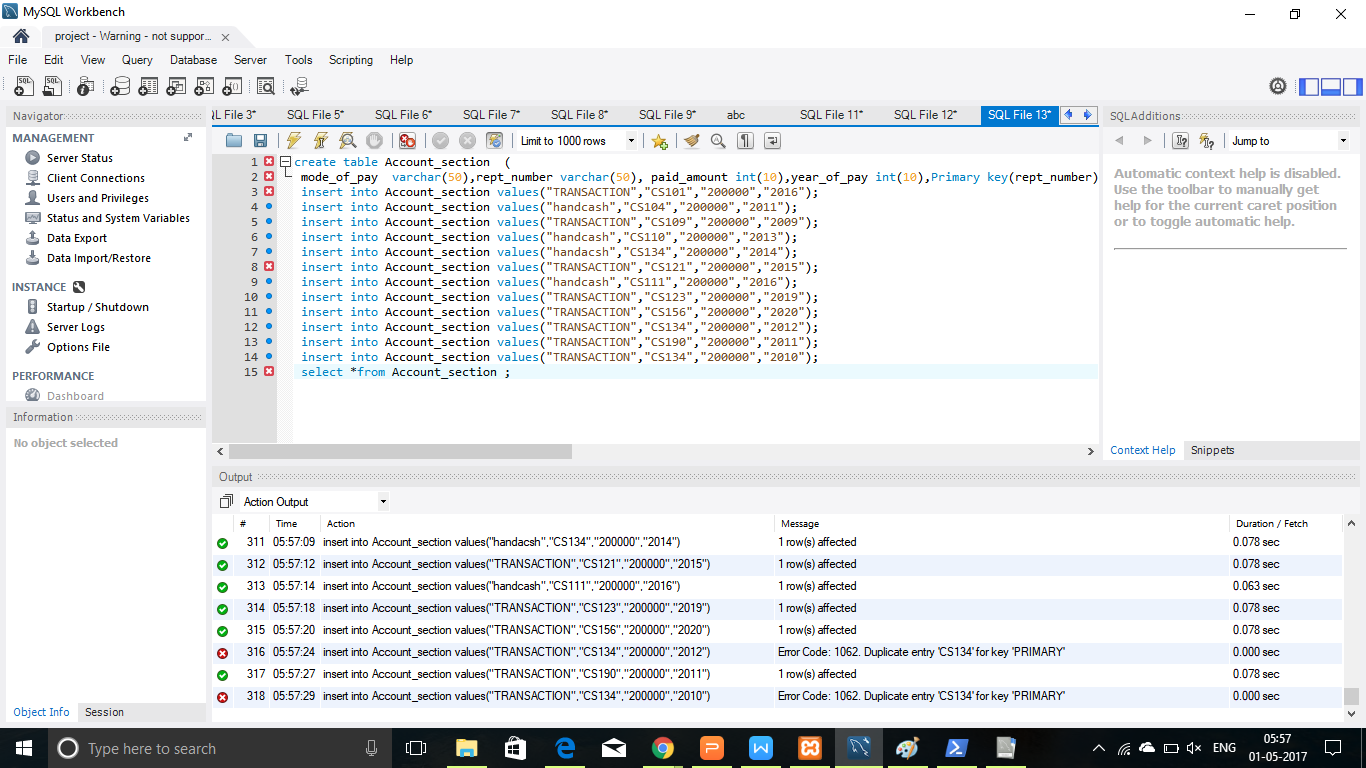
1. Table hostel

Code:

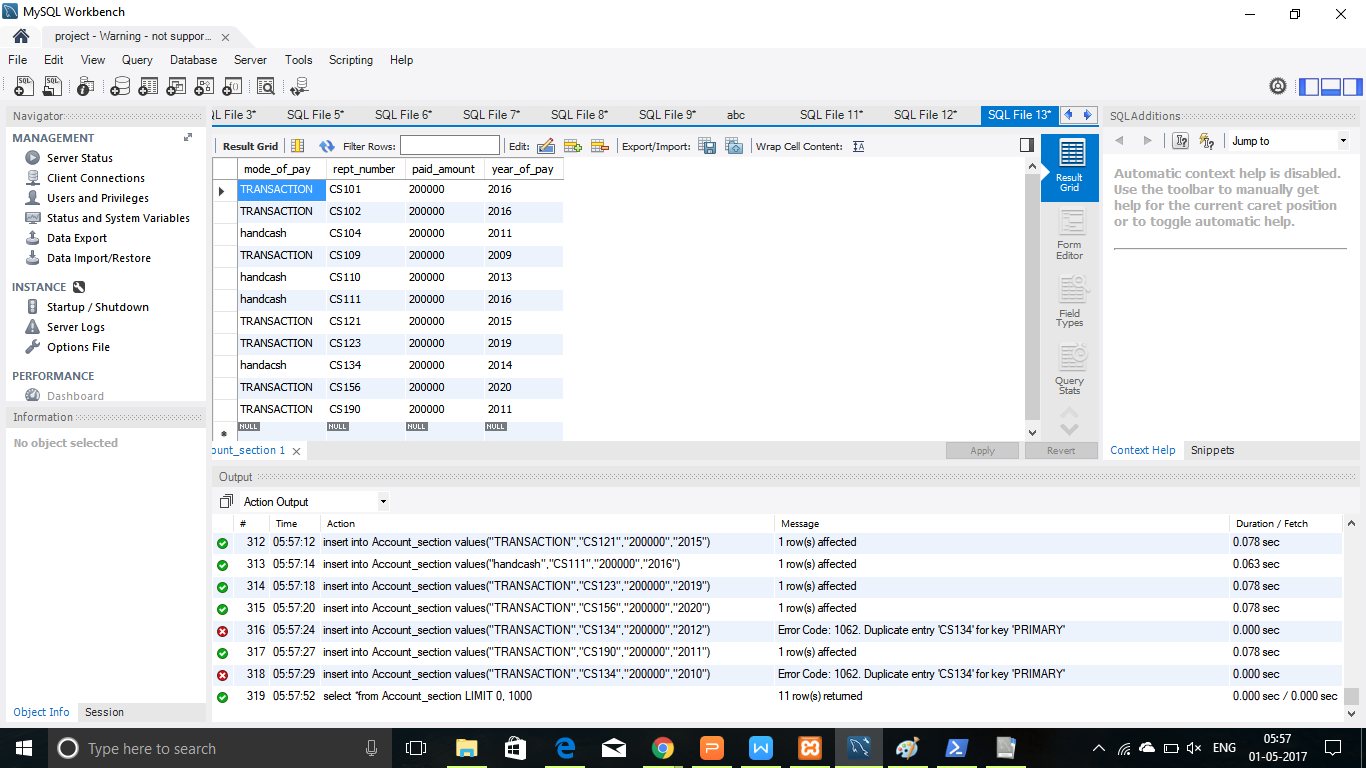


Output:



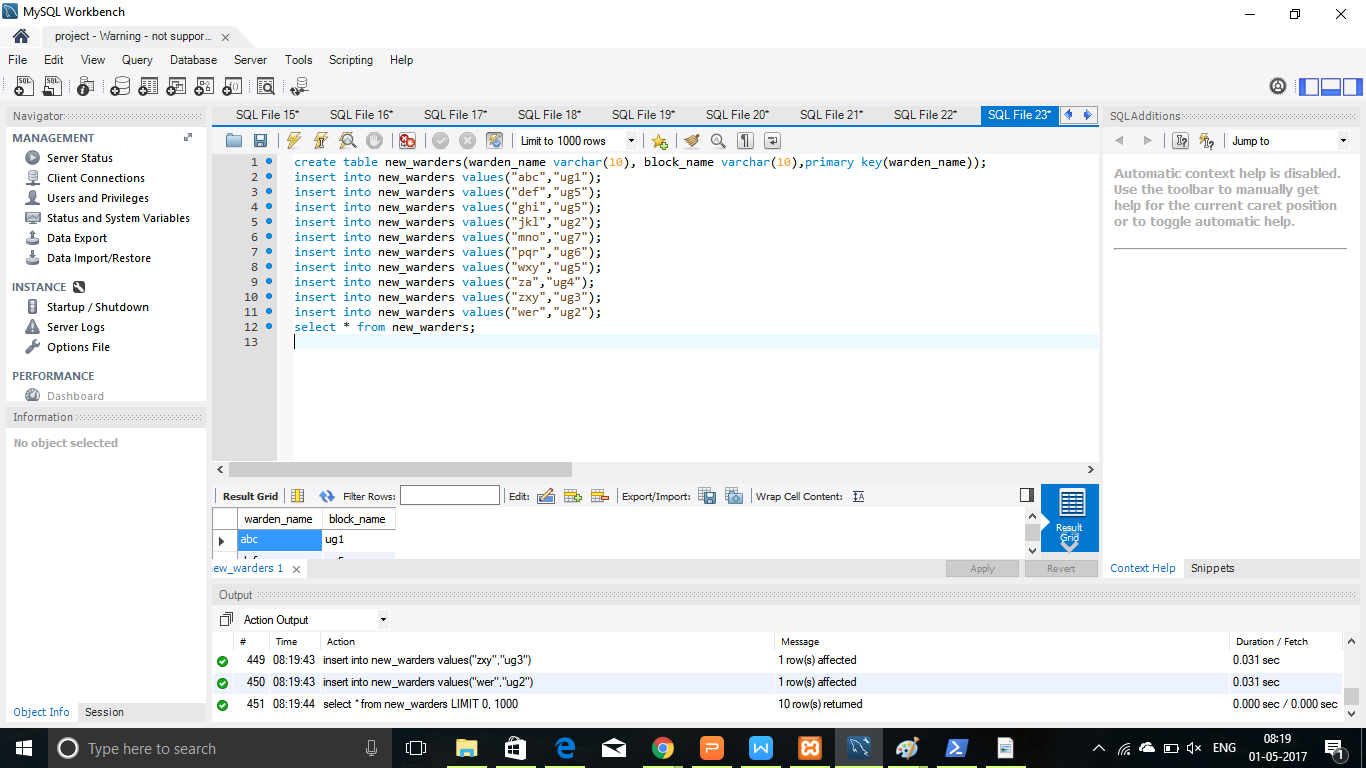
1. Accoun

Output:

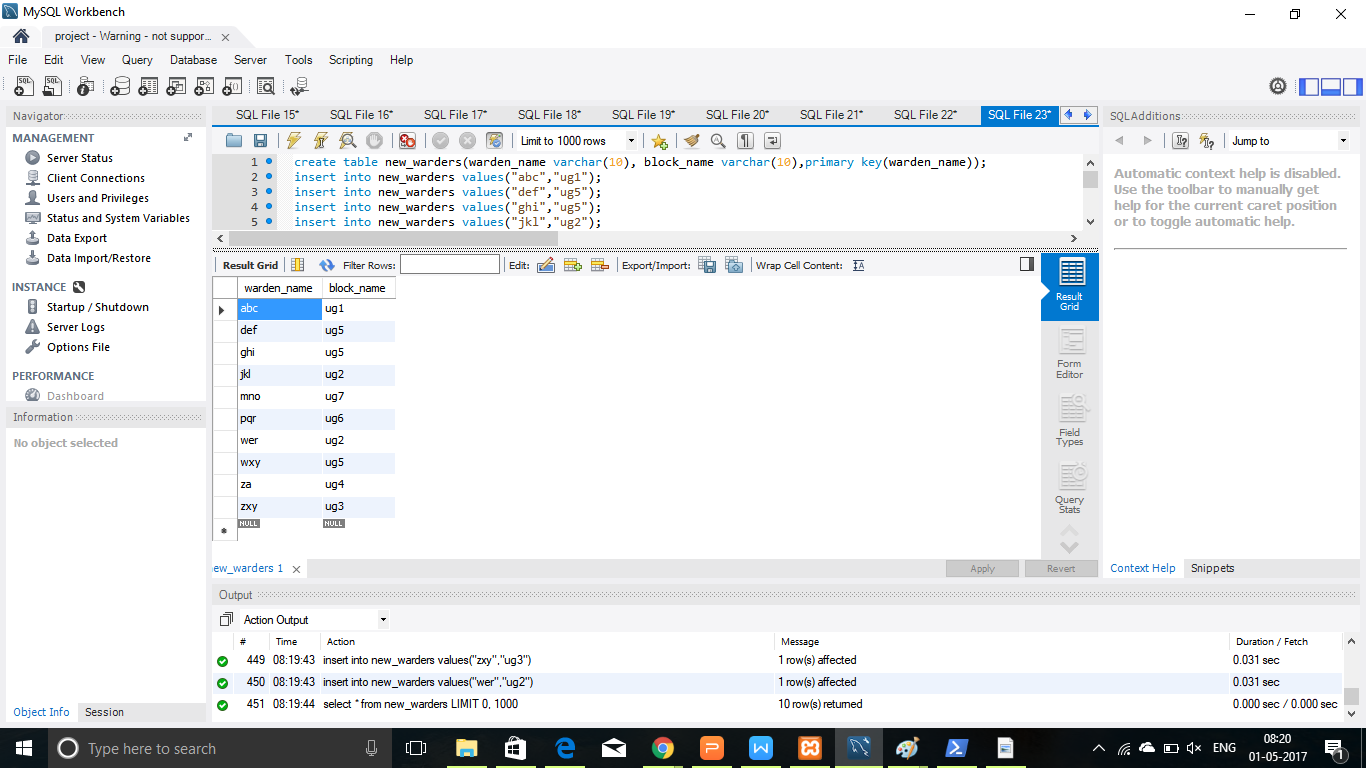


1. Table wardens

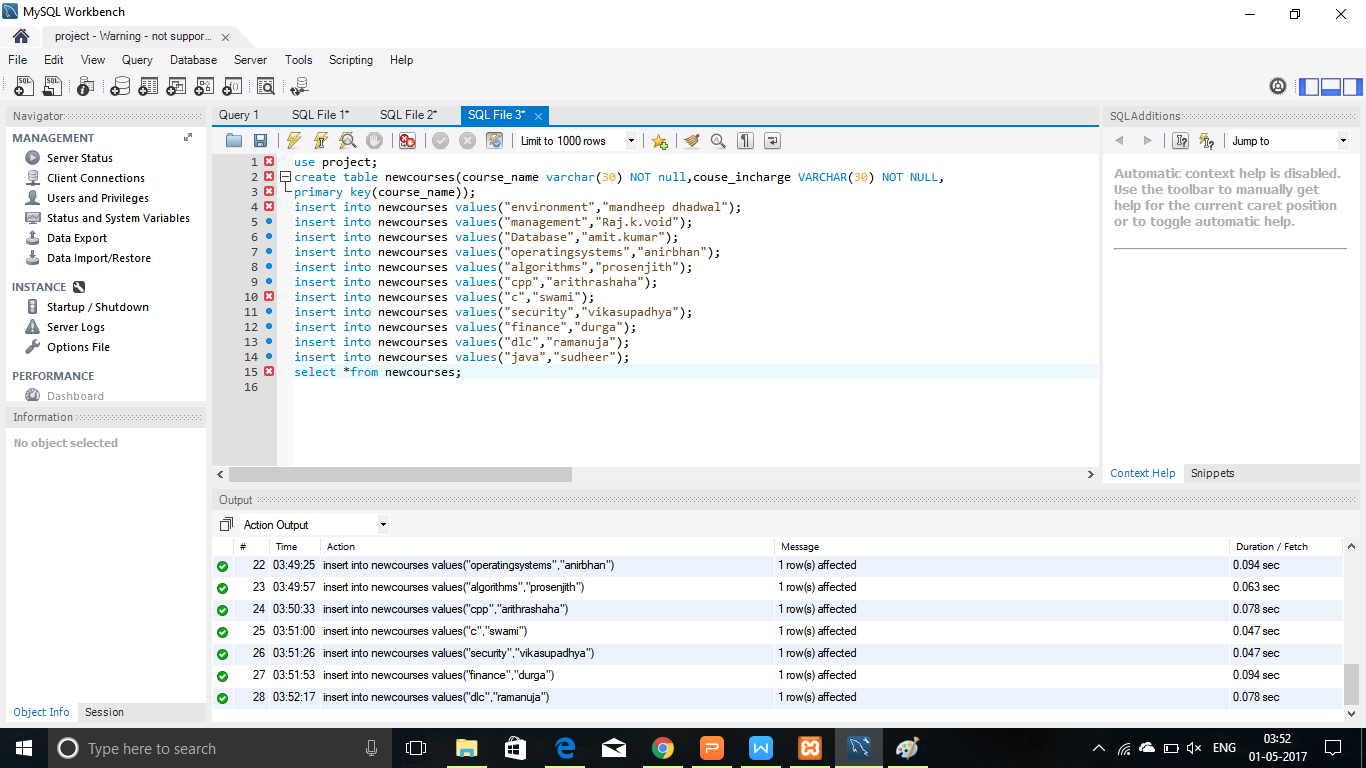
Code:



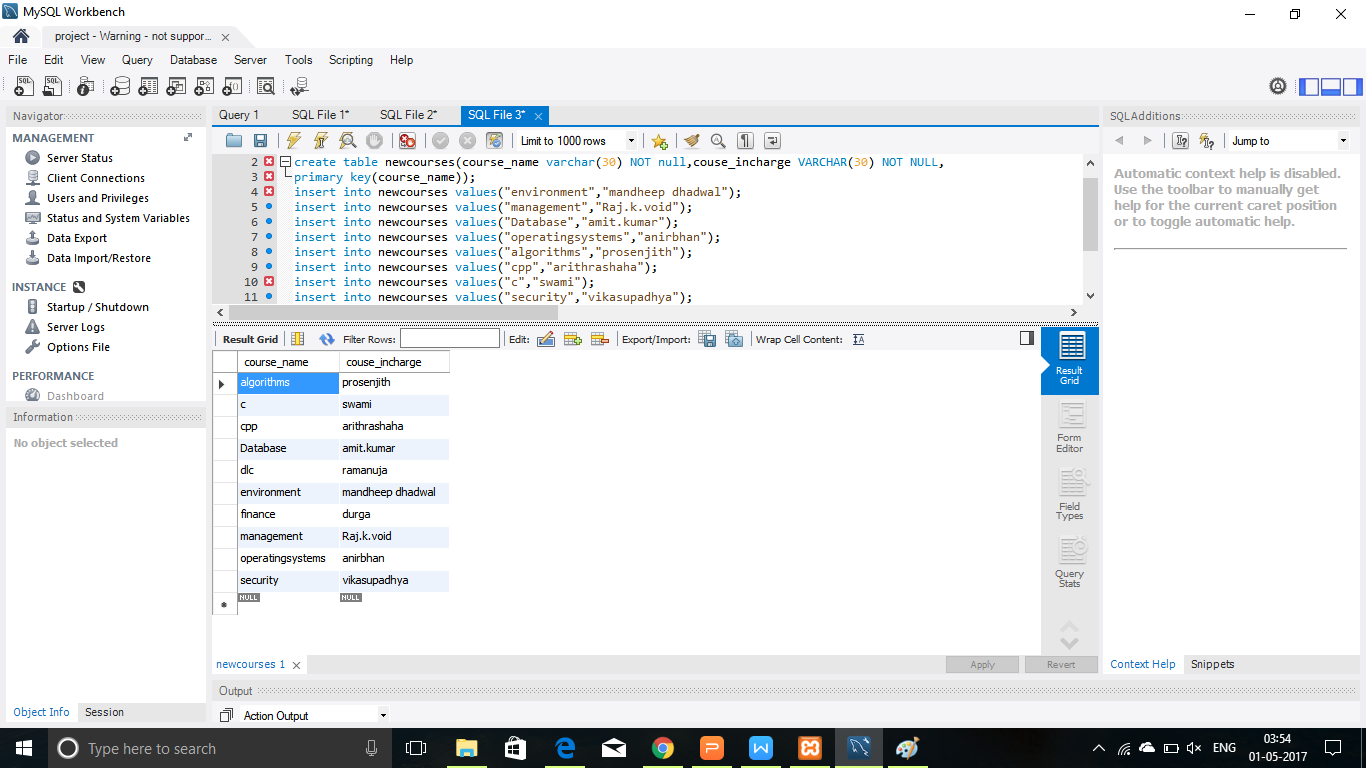
Output:

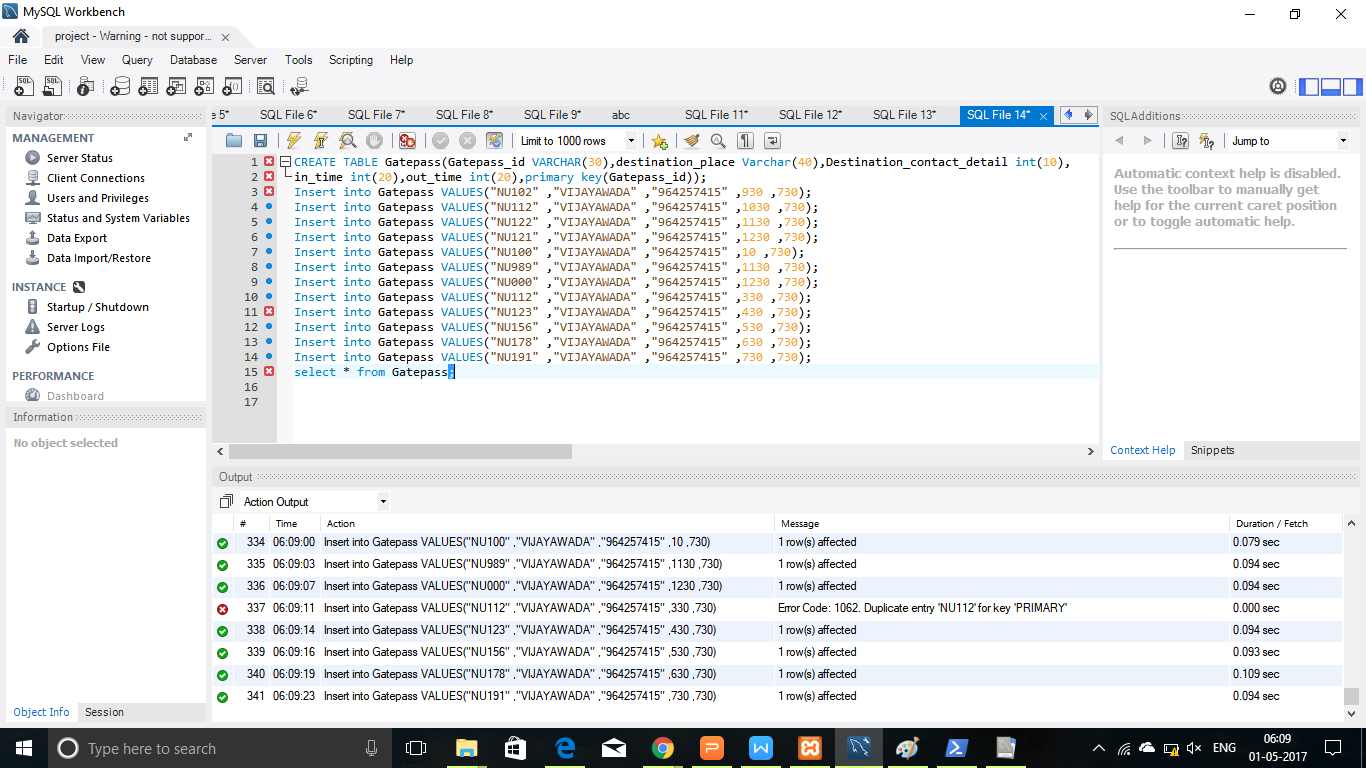


1. table course



Output:



1. Table gatepass

Output:

