```python
from sqlalchemy import create_engine

engine = create_engine(
    "mysql+mysqlconnector://root:Kanishka1@localhost/college_db"
)

try:
    with engine.connect() as conn:
        print("Connection Successfull")
except Exception as e:
    print("Error:", e)
```

```
PS C:\Users\sakan\OneDrive\Desktop\CTS_Handsons> python test_connection.py
Connection Successfull
PS C:\Users\sakan\OneDrive\Desktop\CTS_Handsons>
```

```python
class Professor(Base):
    professor_id = Column(Integer, primary_key=True)
    professor_name = Column(String(100))
    email = Column(String(100))


Base.metadata.create_all(engine)

print("ORM Models Loaded Successfully")
```

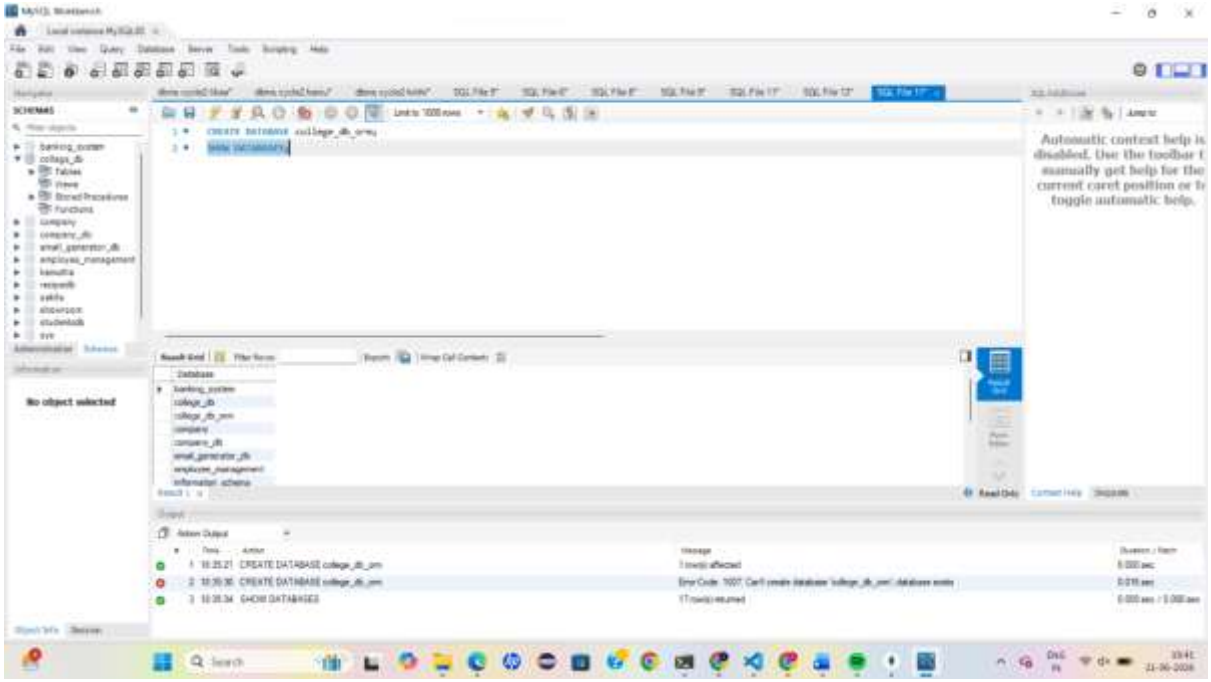
```
2026-06-21 15:28:24,841 INFO sqlalchemy.engine.Engine [raw sql] ()
2026-06-21 15:28:24,844 INFO sqlalchemy.engine.Engine DESCRIBE `college_db`.`courses`
2026-06-21 15:28:24,846 INFO sqlalchemy.engine.Engine [raw sql] ()
2026-06-21 15:28:24,846 INFO sqlalchemy.engine.Engine DESCRIBE `college_db`.`enrollments`
2026-06-21 15:28:24,849 INFO sqlalchemy.engine.Engine [raw sql] ()
2026-06-21 15:28:24,852 INFO sqlalchemy.engine.Engine DESCRIBE `college_db`.`professors`
2026-06-21 15:28:24,854 INFO sqlalchemy.engine.Engine [raw sql] ()
2026-06-21 15:28:24,857 INFO sqlalchemy.engine.Engine COMMIT
ORM Models Loaded Successfully
PS C:\Users\sakan\OneDrive\Desktop\CTS_Handsons>
```

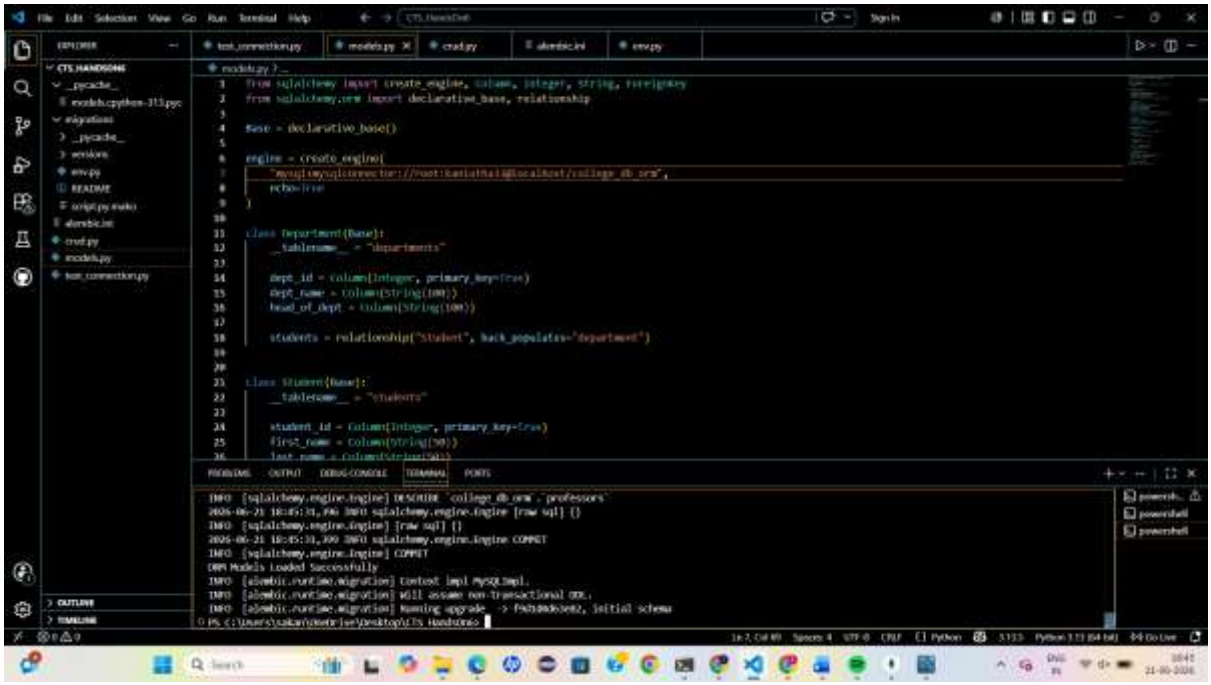
```
head_of_dept="Dr. Kumar"
)

dept2 = Department(
    dept_name="Mechanical",
    head_of_dept="Dr. Raut"
)

dept3 = Department(
    dept_name="Electronics",
    head_of_dept="Dr. Priya"
)

print("Departments added")

# INSERT Students
s1 = Student(first_name="John", last_name="Doe",
             email="john@gmail.com", dept_id=1)

s2 = Student(first_name="Jane", last_name="Smith",
             email="jane@gmail.com", dept_id=1)

s3 = Student(first_name="David", last_name="Lee",
             email="david@gmail.com", dept_id=2)
```

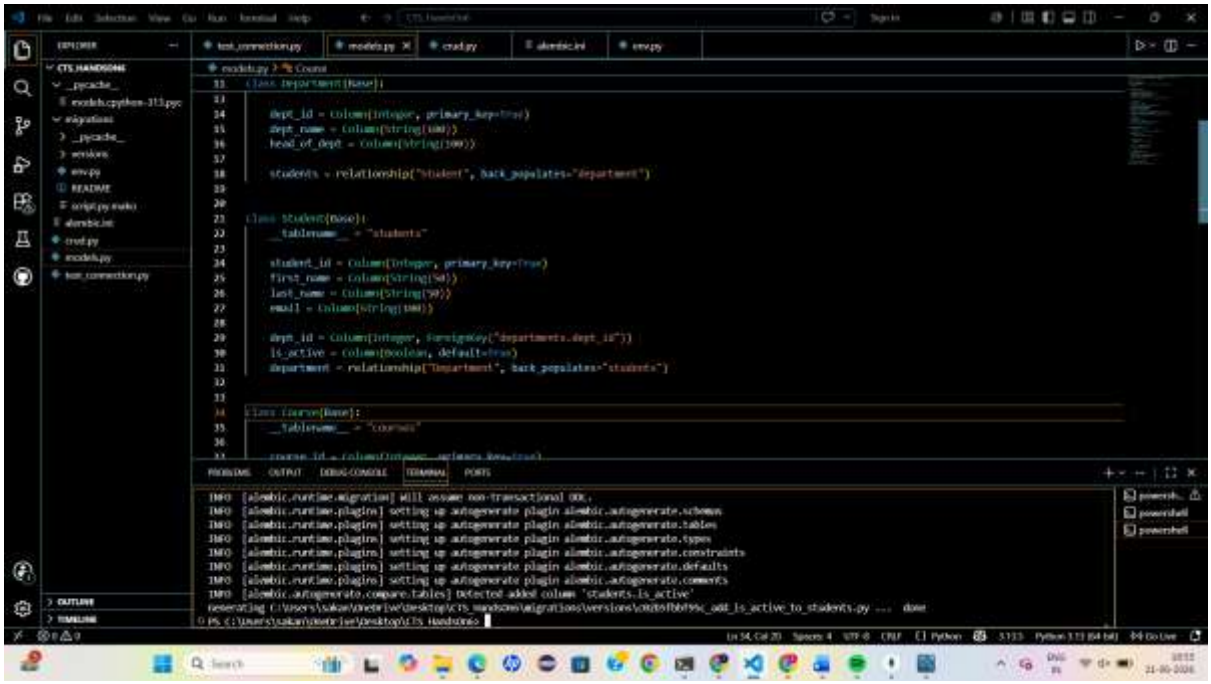
```
2026-06-21 18:17:45,821 INFO sqlalchemy.engine.Engine [generated in 0.00000s] ()
Priya Thermodynamics
Rahul DBMS
Sneha Circuit Theory
Kumar DBMS
Anjali Operating Systems
Meera Circuit Theory
Pradeep Structural Engineering
Nirmalbala Structural Engineering
PS C:\Users\sakam\Desktop\CTS Handsons>
```

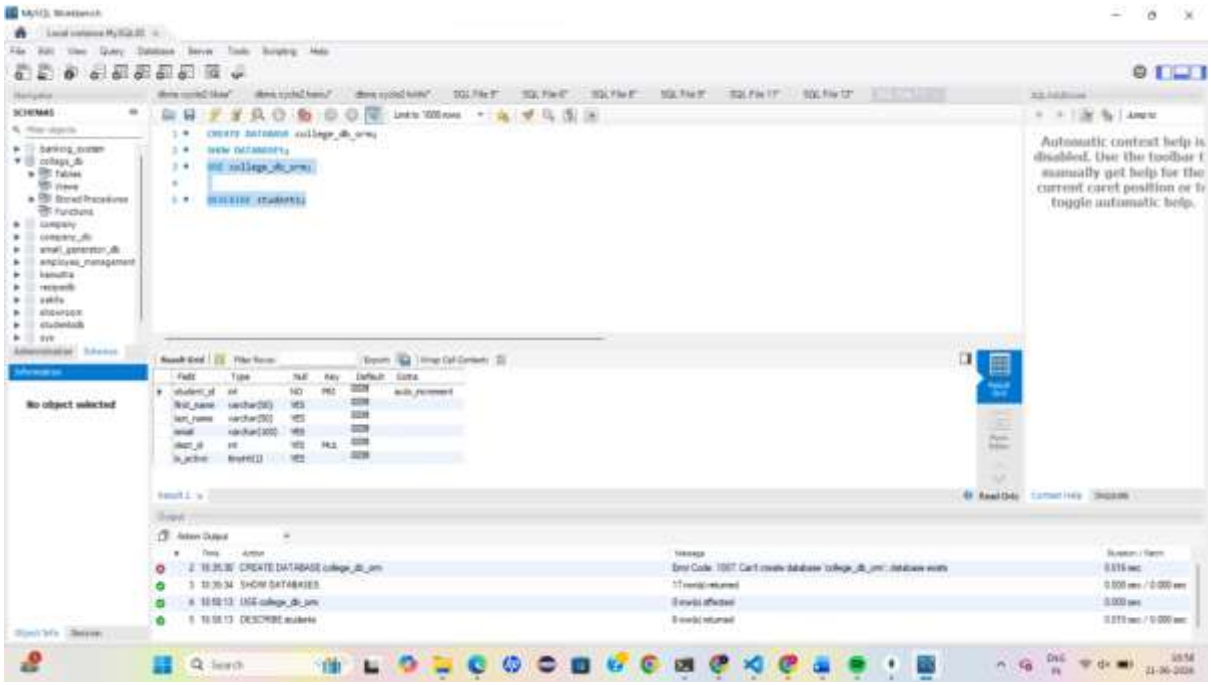
```
def upgrade() -> None:
    existing_type=mysql.VARCHAR(length=100),
    nullable=True)
op.alter_column('students', 'dept_id',
    existing_type=mysql.INTEGER(),
    nullable=True)
op.drop_index(op.f('email'), table_name='students')
op.drop_column('students', 'phone_number')
op.drop_column('students', 'dob')
# ### end Alembic commands ###


def downgrade() -> None:
    """Downgrade schema."""
    # ### commands auto generated by Alembic - please adjust! ###
    op.add_column('students', sa.Column('dob', sa.DATE(), nullable=True))
    op.add_column('students', sa.Column('phone_number', mysql.VARCHAR(length=15), nullable=True))
    op.create_index(op.f('email'), 'students', ['email'], unique=True)
    op.alter_column('students', 'dept_id',
    existing_type=mysql.INTEGER(),
    nullable=False)
    op.alter_column('students', 'email',
    existing_type=mysql.VARCHAR(length=100),
    nullable=False)
    op.alter_column('students', 'last_name',
```

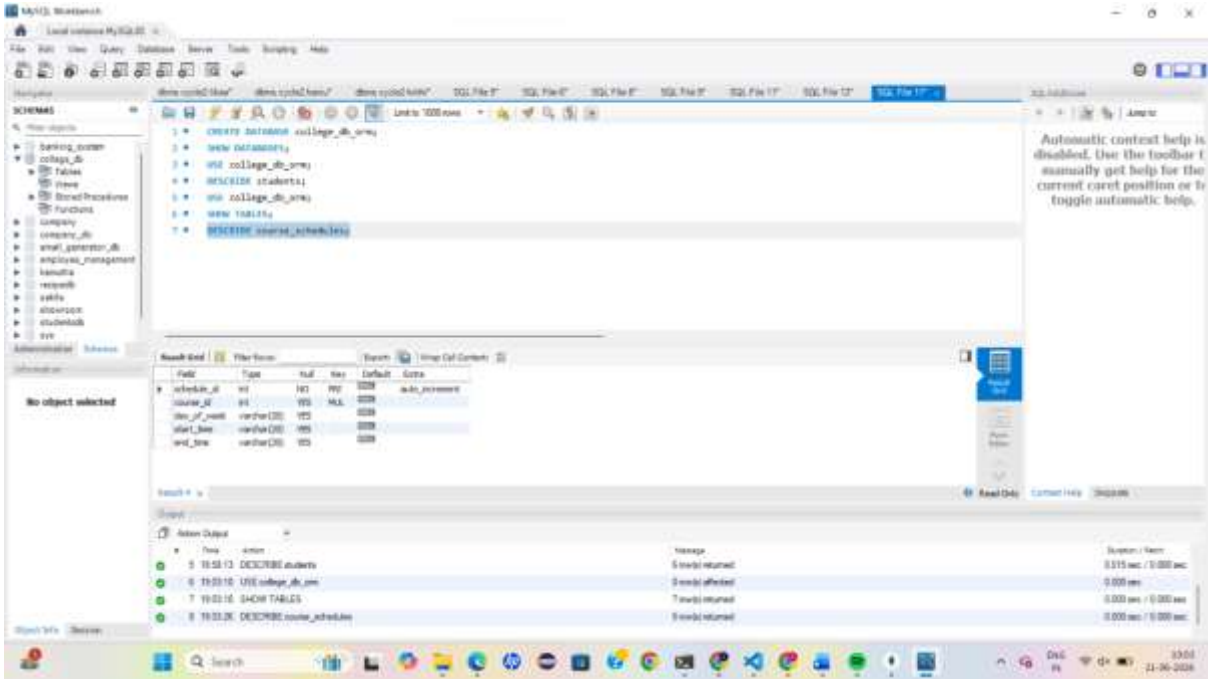
```
INFO [sqlalchemy.engine.Engine] SELECT @@lower_case_table_names
2026-06-21 18:29:23,696 INFO sqlalchemy.engine.Engine [raw sql] ()
INFO [sqlalchemy.engine.Engine] [raw sql] ()
2026-06-21 18:29:23,697 INFO sqlalchemy.engine.Engine BEGIN (implicit)
INFO [sqlalchemy.engine.Engine] BEGIN (implicit)
2026-06-21 18:29:23,698 INFO sqlalchemy.engine.Engine DESCRIBE `college_db`.`departments`
INFO [sqlalchemy.engine.Engine] DESCRIBE `college_db`.`departments`
2026-06-21 18:29:23,698 INFO sqlalchemy.engine.Engine [raw sql] ()
INFO [sqlalchemy.engine.Engine] [raw sql] ()
2026-06-21 18:29:23,705 INFO sqlalchemy.engine.Engine DESCRIBE `college_db`.`students`
```

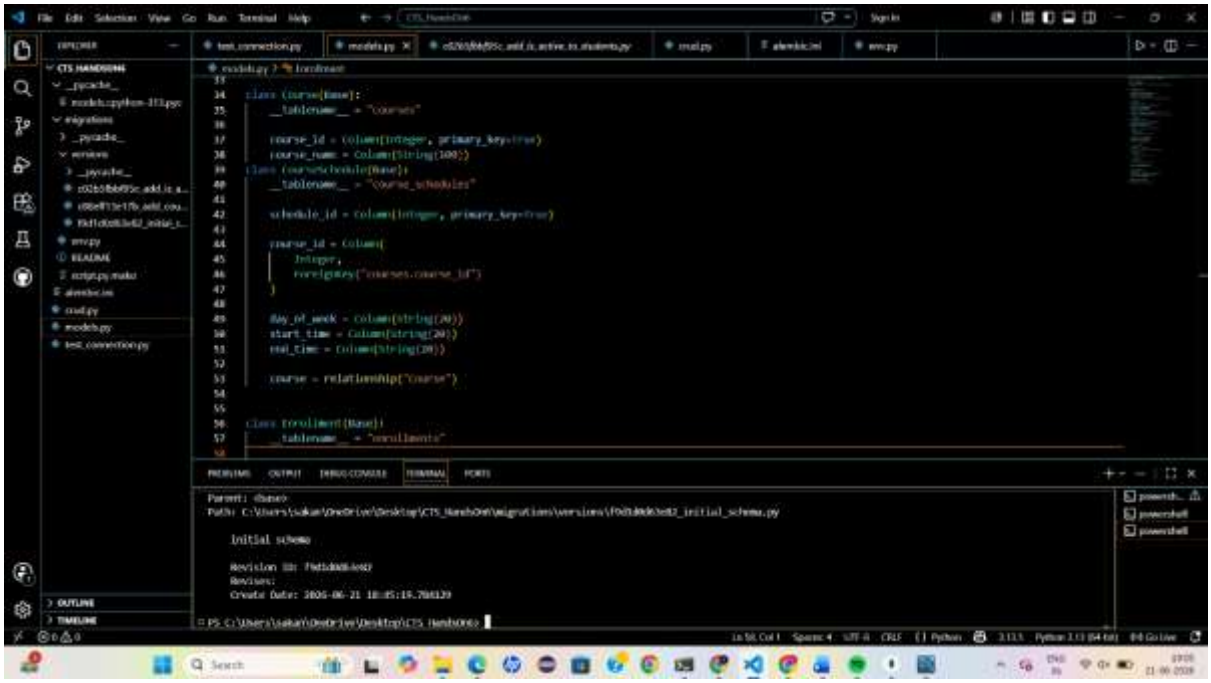

CREATE DATABASE college_db_orm;
SHOW DATABASES;
No object selected
Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

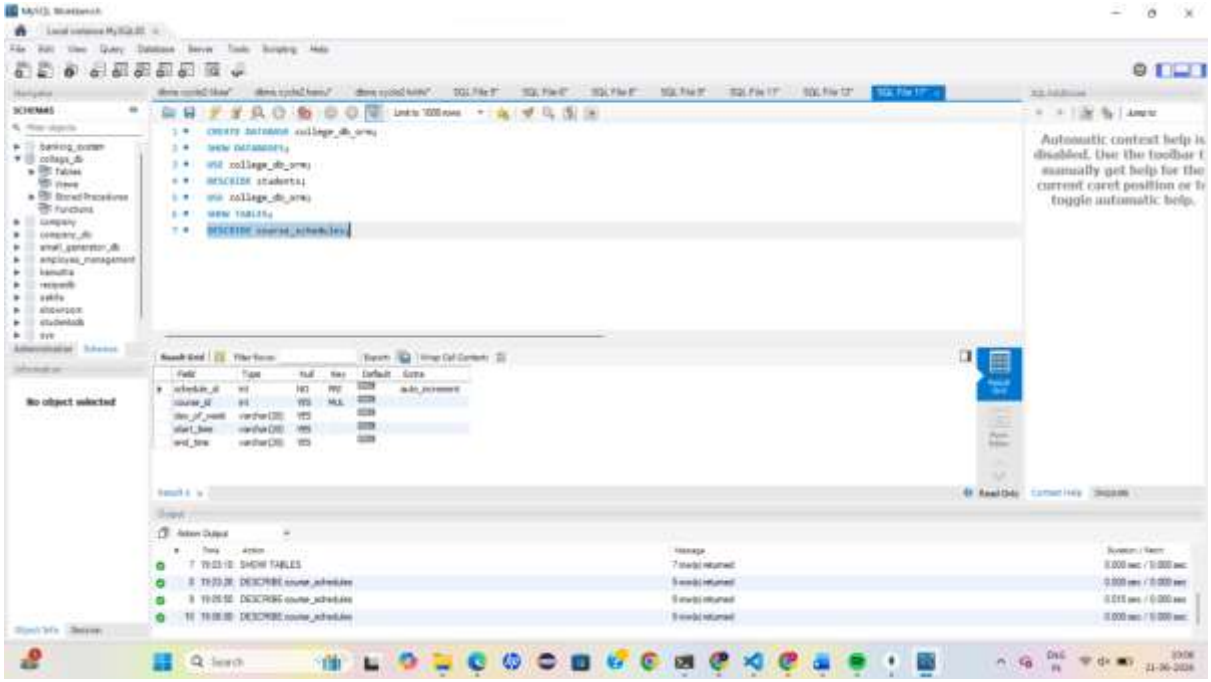

models.py
from sqlalchemy import create_engine, Column, Integer, String, ForeignKey
from sqlalchemy.orm import declarative_base, relationship
Base = declarative_base()
engine = create_engine(
"mysql+mysqlconnector://root:kanishka@localhost/college_db_orm",
echo=True
)
class Department(Base):
__tablename__ = "departments"
dept_id = Column(Integer, primary_key=True)
dept_name = Column(String(100))
head_of_dept = Column(String(100))
students = relationship("Student", back_populates="department")
class Student(Base):
__tablename__ = "students"
student_id = Column(Integer, primary_key=True)
first_name = Column(String(50))
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
INFO [sqlalchemy.engine.Engine] DESCRIBE `college_db_orm`.`professors`
INFO [sqlalchemy.engine.Engine] [raw sql] ()
INFO [sqlalchemy.engine.Engine] COMMIT
DBM Models Loaded Successfully
INFO [alembic.runtime.migration] Will assume non-transactional DDL.
INFO [alembic.runtime.migration] Running upgrade -> f4b8d6e4e2, initial schema

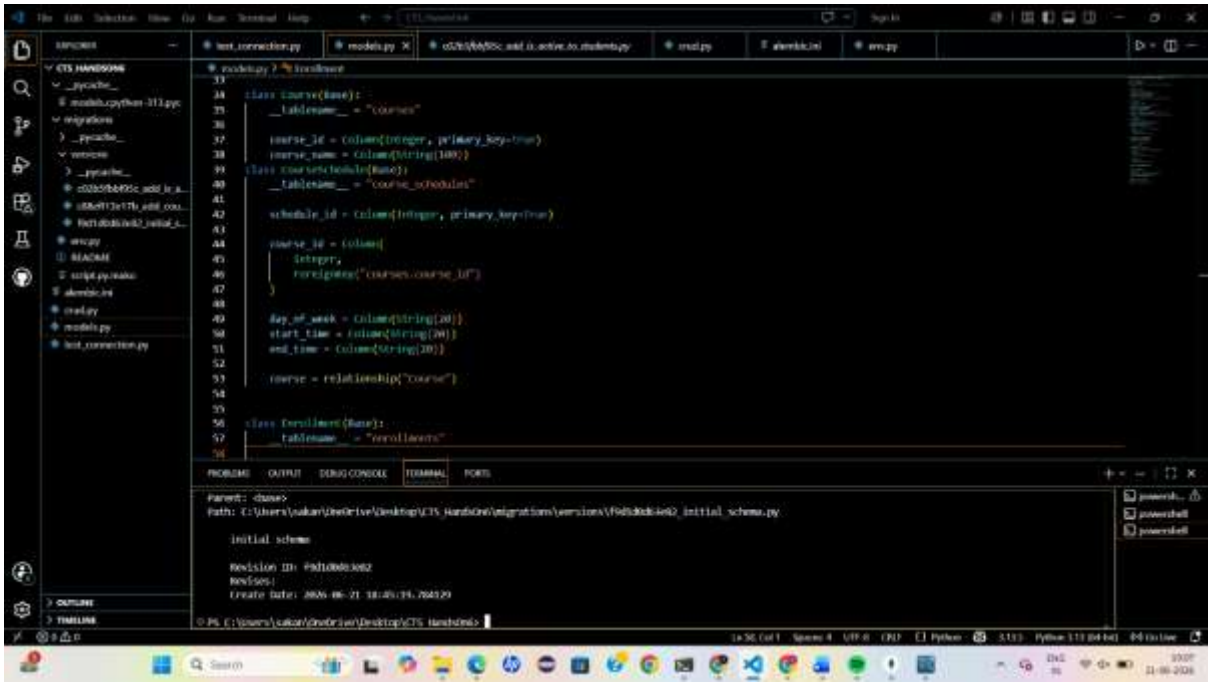

class Department(Base):
dept_id = Column(Integer, primary_key=True)
dept_name = Column(String(100))
head_of_dept = Column(String(100))
students = relationship("Student", back_populates="department")
class Student(Base):
__tablename__ = "students"
student_id = Column(Integer, primary_key=True)
first_name = Column(String(50))
last_name = Column(String(50))
email = Column(String(100))
dept_id = Column(Integer, ForeignKey("departments.dept_id"))
is_active = Column(Boolean, default=True)
department = relationship("Department", back_populates="students")
class Course(Base):
__tablename__ = "courses"
INFO [alembic.runtime.migration] Will assume non-transactional DDL.
INFO [alembic.autogenerate.compare.tables] Detected added column 'students.is_active'
Generating C:\users\sakar\desktop\cts handsons\migrations\versions\c0d6fbb99c_add_is_active_to_students.py ... done

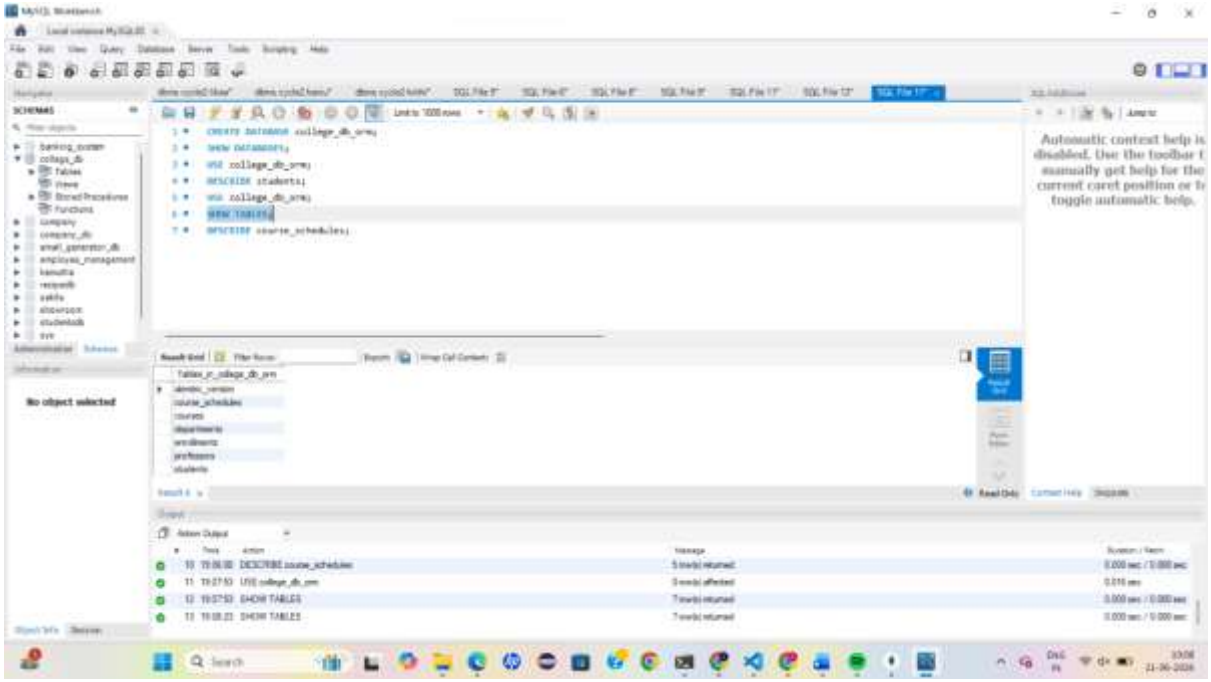

CREATE DATABASE college_db_orm;
SHOW DATABASES;
USE college_db_orm;
DESCRIBE students;
No object selected
Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

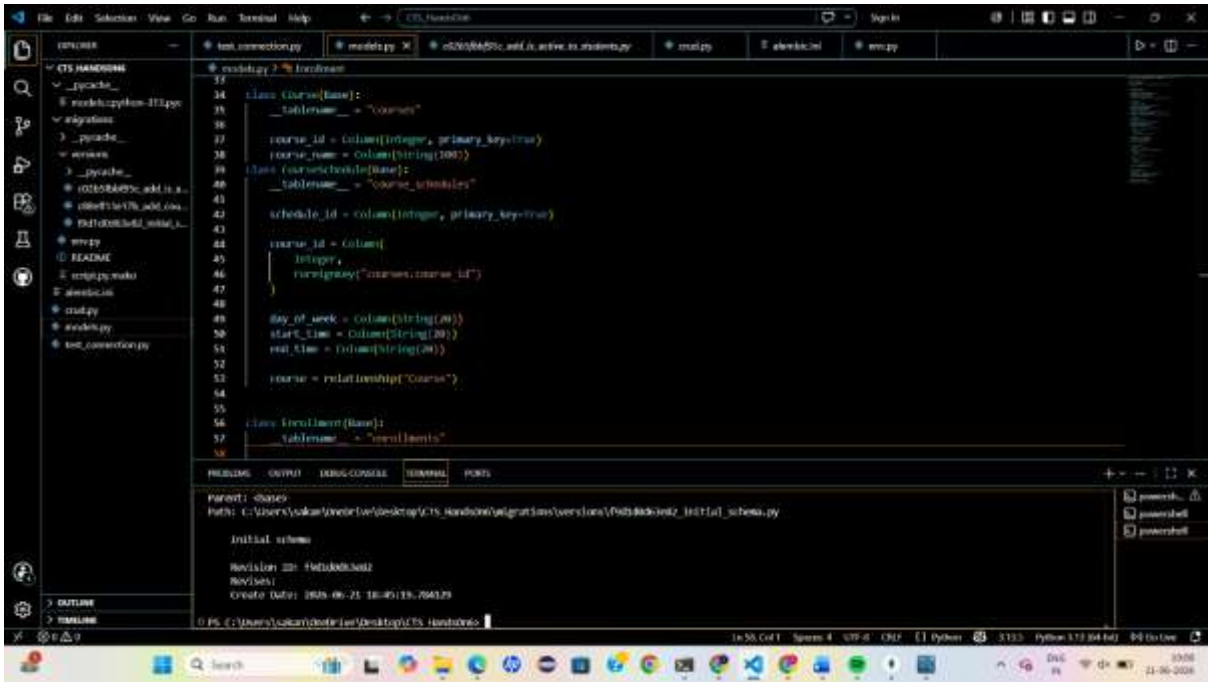

CREATE DATABASE college_db_srmu;
SHOW DATABASES;
USE college_db_srmu;
DESCRIBE students;
USE college_db_srmu;
SHOW TABLES;
DESCRIBE course_schedules;
No object selected
Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.
DESCRIBE students
USE college_db_srmu
SHOW TABLES
DESCRIBE course_schedules


class Course(Base):
__tablename__ = "courses"
course_id = Column(Integer, primary_key=True)
course_name = Column(String(100))
class CourseSchedule(Base):
__tablename__ = "course_schedules"
schedule_id = Column(Integer, primary_key=True)
course_id = Column(
Integer,
ForeignKey("courses.course_id")
)
day_of_week = Column(String(20))
start_time = Column(String(20))
end_time = Column(String(20))
course = relationship("Course")
class Enrollment(Base):
__tablename__ = "enrollments"
Initial schema
Revision ID: f9d3d8d63e82
Revises:
Create Date: 2026-06-21 18:05:19.784129


CREATE DATABASE college_db_crmu;
SHOW DATABASES;
USE college_db_crmu;
DESCRIBE students;
USE college_db_crmu;
SHOW TABLES;
DESCRIBE course_schedules;
No object selected
SHOW TABLES
DESCRIBE course_schedules
DESCRIBE course_schedules
DESCRIBE course_schedules


CTS HANDSONS
class Course(Base):
__tablename__ = "courses"
course_id = Column(Integer, primary_key=True)
course_name = Column(String(100))
class CourseSchedule(Base):
__tablename__ = "course_schedules"
schedule_id = Column(Integer, primary_key=True)
course_id = Column(
Integer,
ForeignKey("courses.course_id")
)
day_of_week = Column(String(20))
start_time = Column(String(20))
end_time = Column(String(20))
course = relationship("Course")
class Enrollment(Base):
__tablename__ = "enrollments"
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
Parent: <base>
initial schema
Revision ID: f9d5d0d1e02
Revises:
Create Date: 2026-06-21 18:45:34.784929


CREATE DATABASE college_db_crm;
SHOW DATABASES;
USE college_db_crm;
DESCRIBE students;
USE college_db_crm;
SHOW TABLES;
DESCRIBE course_schedules;
No object selected
Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.
DESCRIBE course_schedules
USE college_db_crm
SHOW TABLES
SHOW TABLES


CTS_HandsOnE
Sign In
CTS HANDSONE
__pycache__
models.cpython-311.pyc
migrations
__pycache__
versions
__pycache__
c02b5b8d93c_add_is_active_to_students.py
c08e811e17b_add_cou...
f9d1d0d83e82_initial_s...
env.py
README
script.py.mako
alembic.ini
crud.py
models.py
test_connection.py
test_connection.py
models.py
c02b5b8d93c_add_is_active_to_students.py
crud.py
alembic.ini
env.py
models.py > Enrollment
class Course(Base):
__tablename__ = "courses"
course_id = Column(Integer, primary_key=True)
course_name = Column(String(100))
class CourseSchedule(Base):
__tablename__ = "course_schedules"
schedule_id = Column(Integer, primary_key=True)
course_id = Column(
Integer,
ForeignKey("courses.course_id")
)
day_of_week = Column(String(20))
start_time = Column(String(20))
end_time = Column(String(20))
course = relationship("Course")
class Enrollment(Base):
__tablename__ = "enrollments"
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
Parent: <base>
Path: C:\Users\sakar\notor\w\desktop\CTS_HandsOnE\migrations\versions\f9d1d0d83e82_initial_schema.py
Initial schema
Revision ID: f9d1d0d83e82
Revises:
Create Date: 2026-06-21 18:45:19.784129
PS C:\Users\sakar\notor\w\desktop\CTS_HandsOnE>
powersh...
powershell
powershell
OUTLINE
TIMELINE