Basic SQLAlchemy (ORM) Interview Questions & Answers in Python

Q1. What is SQLAlchemy in Python?

- SQLAlchemy is a Python SQL toolkit and Object Relational Mapper (ORM).

- It allows developers to interact with databases using Python classes and objects instead of writing raw SQL queries.

- It supports multiple databases (MySQL, PostgreSQL, SQLite, Oracle, etc.).

Q2. What is ORM (Object Relational Mapping)?

- ORM is a technique that allows you to map database tables to Python classes.

- Each row in a table is represented as a Python object, and each column as an attribute.

- This reduces the need to write raw SQL and makes database operations more Pythonic.

Q3. How do you install SQLAlchemy?
pip install sqlalchemy

Q4. How do you connect to a database using SQLAlchemy?
from sqlalchemy import create_engine

# Example: SQLite database
engine = create_engine("sqlite:///example.db")

Example: PostgreSQL
engine = create_engine("postgresql://user:password@localhost/mydb")

Q5. How do you define a table using SQLAlchemy ORM?
from sqlalchemy import Column, Integer, String, create_engine
from sqlalchemy.ext.declarative import declarative_base

Base = declarative_base()

class User(Base):
    __tablename__ = "users"
    id = Column(Integer, primary_key=True)
    name = Column(String)
    age = Column(Integer)

```python
# Create table
engine = create_engine("sqlite:///example.db")
Base.metadata.create_all(engine)
```

Q6. How do you create a session in SQLAlchemy?
```python
from sqlalchemy.orm import sessionmaker

Session = sessionmaker(bind=engine)
session = Session()
```

Q7. How do you insert a record using SQLAlchemy ORM?
```python
new_user = User(name="Alice", age=25)
session.add(new_user)
session.commit()
```

Q8. How do you query records in SQLAlchemy?
```python
# Fetch all
users = session.query(User).all()

# Fetch with filter
user = session.query(User).filter_by(name="Alice").first()

print(user.name, user.age)
```

Q9. How do you update a record in SQLAlchemy?
```python
user = session.query(User).filter_by(name="Alice").first()
user.age = 26
session.commit()
```

Q10. How do you delete a record in SQLAlchemy?
```python
user = session.query(User).filter_by(name="Alice").first()
session.delete(user)
session.commit()
```