



**CENTRAL BOARD OF SECONDARY EDUCATION**  
**PM SHRI Kendriya Vidyalaya-3 9 B.R.D.**  
**A.F.S. Pune- 411014**

**A PROJECT RECORD FILE IS SUBMITTED FOR THE  
COMPUTER SCIENCE, CLASS 12, SESSION 2024-25**

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**CLASS:- 12<sup>th</sup> A**

**ROLL NUMBER:- 12116**

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# CERTIFICATE

This is to certify that Aman Mondal student of class XI, Kendriya Vidyalaya-3 9 B.R.D. A.F.S. Pune- 411014 has completed the **Project File** during the academic year 2024-25 towards partial fulfilment of credit for the **Computer Science** project evaluation of 2024-25 and submitted satisfactory report, as compiled in the following pages, under my supervision.

Internal Examiner

Signature

External Examiner

Signature

Date: 18.10.2024

School Seal

Principal  
Signature

# ACKNOWLEDGEMENT

I wish to express my deep sense of gratitude and indebtedness to our learned teacher **Sushma Singh Chouhan, C.S. Teacher, Kendriya Vidyalaya-3 9 B.R.D. A.F.S. Pune- 411014** for her invaluable help, advice and guidance in the preparation of this project.

I am also greatly indebted to our Principal **Mr. Mohd. Nassimuddin** and school authorities for providing me with the facilities and requisite laboratory conditions for making this Project file.

I also extend my thanks to a number of teachers, my classmates and my friends who helped me to complete this Project file successfully.

**Aman Mondal**

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Q1. Write a Python program to generate prime numbers for a given range.

Source Code:-

```
1.py - F:\Aman Mondal\Practicals\1.py (3.11.4)
File Edit Format Run Options Window Help

def generate_primes():
    start = int(input("Enter Start of Range: "))
    end = int(input("Enter End of Range: "))
    primes = []
    for num in range(start, end + 1):
        if num > 1:
            for i in range(2, num):
                if num % i == 0:
                    break
            else:
                primes.append(num)
    print("List with Prime Numbers is-", primes)
generate_primes()
```

Output:-

```
IDLE Shell 3.11.4
File Edit Shell Debug Options Window Help

Python 3.11.4 (tags/v3.11.4:d2340ef, Jun 7 2023, 05:45:37) [MSC v.1934 64 bit
(AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: F:\Aman Mondal\Practicals\1.py
Enter Start of Range: 1
Enter End of Range: 10
List with Prime Numbers is- [2, 3, 5, 7]
>>> |
```

Q2. Develop a program that takes a list of words and returns a new list containing only the words that start with a vowel.

## Source Code:-

```
2.py - F:\Aman Mondal\Practicals\2.py (3.11.4)
File Edit Format Run Options Window Help
def only_vowels():
    sent = input("Enter a sentence: ")
    words = sent.split()
    newlist=[]
    for i in words:
        if i[0] in 'AEIOUaeiou':
            newlist.append(i)
    print('New list containing only the words that start with a vowel- ', newlist)

only_vowels()
```

## Output:-

```
IDLE Shell 3.11.4
File Edit Shell Debug Options Window Help
Python 3.11.4 (tags/v3.11.4:d2340ef, Jun 7 2023, 05:45:37) [MSC v.1934 64 bit
(AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: F:\Aman Mondal\Practicals\2.py
Enter a sentence: Hello, My name is Aman Mondal
New list containing only the words that start with a vowel- ['is', 'Aman']
>>> |
```

Q3. Write a Python program to find and print the sum of the digits of a user-input number.

Source Code:-

```
3.py - F:\Aman Mondal\Practicals\3.py (3.11.4)
File Edit Format Run Options Window Help
num=input('Enter a Number to find the sum of its digits: ')
Sum=0
for i in range(len(num)):
    Sum+=int(num[i])
print('Sum of digits of', num, 'is', Sum)
```

Output:-

```
IDLE Shell 3.11.4
File Edit Shell Debug Options Window Help
Python 3.11.4 (tags/v3.11.4:d2340ef, Jun 7 2023, 05:45:37) [MSC v.1934 64 bit
(AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: F:\Aman Mondal\Practicals\3.py
Enter a Number to find the sum of its digits: 1047
Sum of digits of 1047 is 12
>>> |
```

Q4. Create a program that generates a random list of numbers and finds the largest and smallest numbers without using built-in functions like max() and min().

Source Code:-

```
4.py - F:\Aman Mondal\Practicals\4.py (3.11.4)
File Edit Format Run Options Window Help

import random
n=int(input('Enter how many no you want in list of random no: '))
list1=[]
for i in range(n):
    list1.append(random.randint(0,100))
print('List with random no are: ',list1)
maximum=list1[0]
minimum=list1[0]
for j in range(len(list1)):
    if list1[j]>maximum:
        maximum=list1[j]
    if list1[j]<minimum:
        minimum=list1[j]
print('Max no in list is: ',maximum)
print('Min no in list is: ',minimum)
```

Output:-

```
IDLE Shell 3.11.4
File Edit Shell Debug Options Window Help
Python 3.11.4 (tags/v3.11.4:d2340ef, Jun 7 2023, 05:45:37) [MSC v.1934 64 bit
(AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: F:\Aman Mondal\Practicals\4.py
Enter how many no you want in list of random no: 7
List with random no are: [90, 88, 0, 20, 11, 71, 54]
Max no in list is: 90
Min no in list is: 0
>>>
```



Q5. Create a binary file with roll number, name and class and insert 3 records in it in the format [roll-no, name, class]. Search for a given roll number and display the name, if not found display appropriate message.

Source Code:-

```
5.py - F:\Aman Mondal\Practicals\5.py (3.11.4)
File Edit Format Run Options Window Help

import pickle
def insert():
    file = open("student.dat", "wb")
    n=int(input("Enter no of records you want to enter: "))
    nested=[]
    for i in range(n):
        roll_no = int(input("Enter roll number: "))
        name = input("Enter name: ")
        Class = int(input("Enter class: "))
        d = [roll_no, name, Class]
        nested.append(d)
    pickle.dump(nested, file)
    file.close()
    print("\nRecords inserted successfully")
def search():
    file = open("student.dat", "rb")
    roll_no = int(input("Enter roll number to search: "))
    file.seek(0)
    while True:
        try:
            Data = pickle.load(file)
        except EOFError:
            break
        for i in Data:
            if i[0]==roll_no:
                print('Rollno- ',i[0], '\nName-',i[1], '\nClass- ',i[2])
                return
    else:
        print("Sorry, Student not found")

insert()
search()
```

Output:-

```
IDLE Shell 3.11.4
File Edit Shell Debug Options Window Help
Python 3.11.4 (tags/v3.11.4:d2340ef, Jun 7 2023, 05:45:37) [MSC v.1934 64 bit
(AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: F:\Aman Mondal\Practicals\5.py
Enter no of records you want to enter: 3
Enter roll number: 1
Enter name: Aman
Enter class: 12
Enter roll number: 2
Enter name: Aayesha
Enter class: 12
Enter roll number: 3
Enter name: Karan
Enter class: 11

Records inserted successfully
Enter roll number to search: 1
Rollno- 1
Name- Aman
Class- 12
>>>
```

Q6. Create a binary file with book,shelf\_no and author and insert 3 records in it in the format {book: [shelf\_no, author]}.Search for a given author and display the name of book and shelf\_no, if not found display appropriate message.

## Source Code:-

```
6.py - F:\Aman Mondal\Practicals\6.py (3.11.4)
File Edit Format Run Options Window Help

import pickle
def insert():
    file = open("library.dat", "wb")
    n=int(input("Enter Number of Records you want to enter: "))
    d={}
    for i in range(n):
        book = input("Enter Book Name: ")
        shelf_no = int(input("Enter Shelf Number: "))
        author = input("Enter Author: ")
        d[book] = [shelf_no, author]
        pickle.dump(d, file)
    file.close()
    print("Records inserted successfully")

def search():
    file = open("library.dat", "rb")
    author = input("Enter Author Name to search: ")
    file.seek(0)
    while True:
        try:
            Data = pickle.load(file)
        except EOFError:
            break
        for i in Data:
            if Data[i][1]==author:
                print('Book Name-',i, '\nShelf Number',Data[i][0], '\nAuthor-',Data[i][1])
                return
        else:
            print("Sorry, Book not found")
insert()
search()
```

## Output:-

```
IDLE Shell 3.11.4
File Edit Shell Debug Options Window Help
Python 3.11.4 (tags/v3.11.4:d2340ef, Jun 7 2023, 05:45:37) [MSC v.1934 64 bit
(AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: F:\Aman Mondal\Practicals\6.py
Enter Number of Records you want to enter: 2
Enter Book Name: Harry Potter
Enter Shelf Number: 1
Enter Author: J. K. Rowling
Enter Book Name: Sherlock Holmes
Enter Shelf Number: 2
Enter Author: Arthur Conan Doyle
Records inserted successfully
Enter Author Name to search: J. K. Rowling
Book Name- Harry Potter
Shelf Number 1
Author- J. K. Rowling
>>>
```

Q7. Create a CSV file by entering user-id and password, read and search the password for given user-id.

## Source Code:-

```
7.py - F:\Aman Mondal\Practicals\7.py (3.11.4)
File Edit Format Run Options Window Help

import csv
def create_csv():
    file=open('users.csv', 'w', newline='')
    writer = csv.writer(file)
    n=int(input("Enter Number of values you want to enter: "))
    for i in range(n):
        user_id = input("Enter User-ID: ")
        password = input("Enter Password: ")
        writer.writerow([user_id, password])

def search_password():
    user_id=input("Enter User-ID to search: ")
    file=open('users.csv', 'r')
    reader = csv.reader(file)
    for row in reader:
        if row[0] == user_id:
            print("Password:", row[1])
            return
create_csv()
search_password()
```

## Output:-

```
IDLE Shell 3.11.4
File Edit Shell Debug Options Window Help

Python 3.11.4 (tags/v3.11.4:d2340ef, Jun 7 2023, 05:45:37) [MSC v.1934 64 bit
(AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

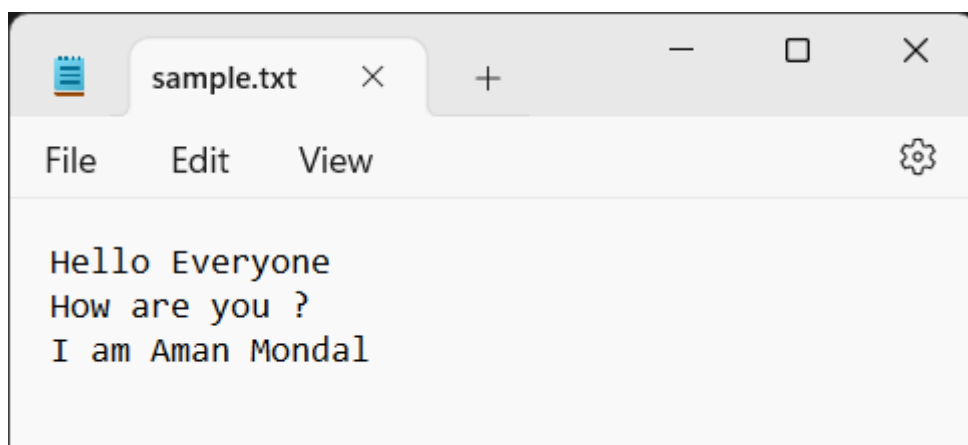
>>>
= RESTART: F:\Aman Mondal\Practicals\7.py
Enter Number of values you want to enter: 3
Enter User-ID: 001
Enter Password: qwerty
Enter User-ID: 002
Enter Password: india
Enter User-ID: 003
Enter Password: password
Enter User-ID to search: 002
Password: india
>>>
```

Q8. Read a text file and display the number of vowels, consonants, uppercase and lowercase characters in the file.

## Source Code:-

```
8.py - F:\Aman Mondal\Practicals\8.py (3.11.4)
File Edit Format Run Options Window Help
def text_file():
    vowels = consonants = uppercase = lowercase = 0
    file= open("sample.txt", "r")
    text = file.read()
    for char in text:
        if char.isalpha():
            if char in 'AEIOUaeiou':
                vowels += 1
            else:
                consonants += 1
        if char.isupper():
            uppercase += 1
        if char.islower():
            lowercase += 1
    print(f"Vowels: {vowels}, Consonants: {consonants}, Uppercase: {uppercase}, Lowercase: {lowercase}")
text_file()
```

## Sample.txt:-

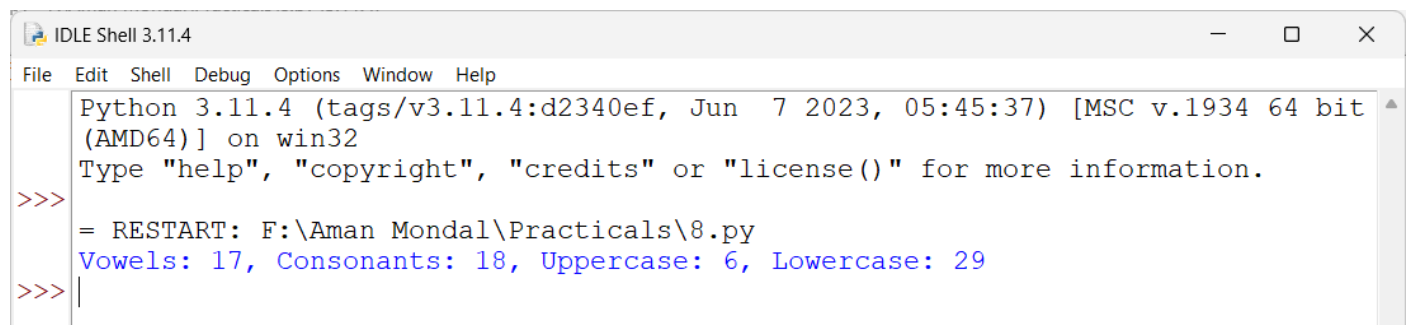


sample.txt

File Edit View

Hello Everyone  
How are you ?  
I am Aman Mondal

## Output:-



IDLE Shell 3.11.4

File Edit Shell Debug Options Window Help

Python 3.11.4 (tags/v3.11.4:d2340ef, Jun 7 2023, 05:45:37) [MSC v.1934 64 bit (AMD64)] on win32  
Type "help", "copyright", "credits" or "license()" for more information.

```
>>> = RESTART: F:\Aman Mondal\Practicals\8.py
Vowels: 17, Consonants: 18, Uppercase: 6, Lowercase: 29
>>> |
```

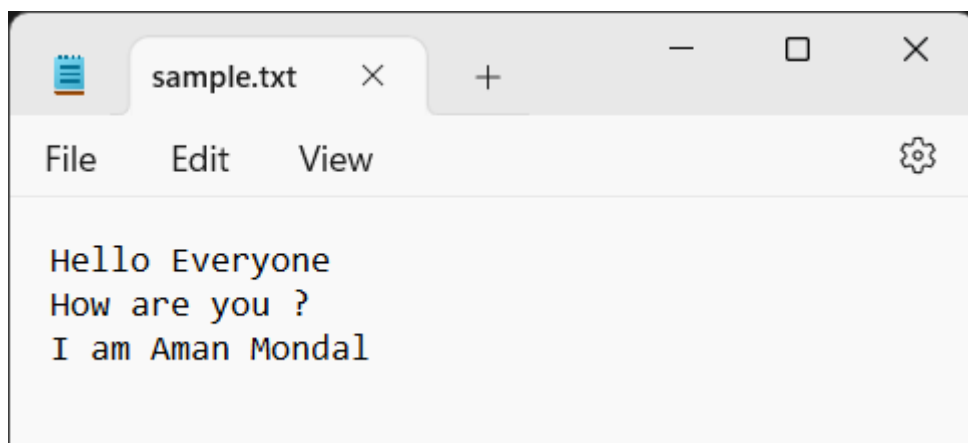
Q9. Create a program that reads a file and counts the frequency of the letter 'H' and 'h'.

Source Code:-

```
9.py - F:\Aman Mondal\Practicals\9.py (3.11.4)
File Edit Format Run Options Window Help

def count_h_in_file():
    count_h = count_H = 0
    file = open('sample.txt', 'r')
    text = file.read()
    count_h = text.count('h')
    count_H = text.count('H')
    print(f"'h': {count_h}, 'H': {count_H}")
count_h_in_file()
```

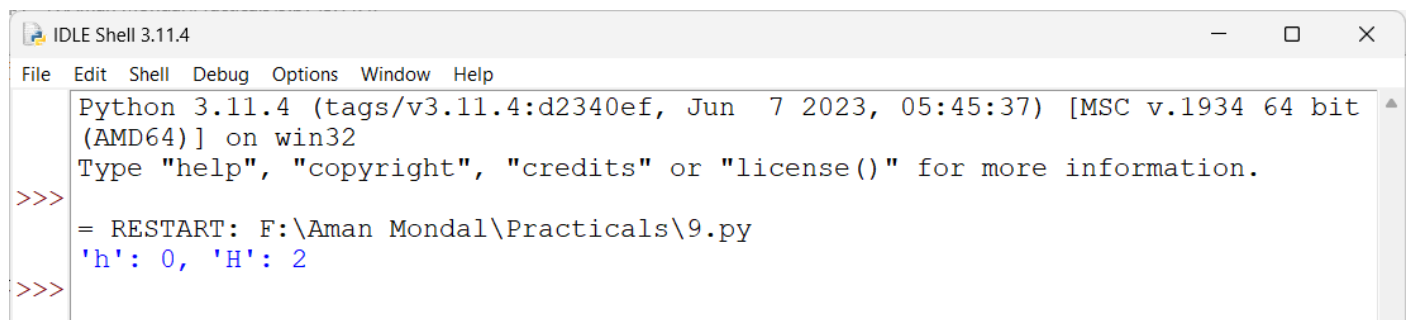
Sample.txt:-



The screenshot shows a text editor window with the title 'sample.txt'. The menu bar includes 'File', 'Edit', and 'View'. The text content of the file is:

```
Hello Everyone
How are you ?
I am Aman Mondal
```

Output:-



The screenshot shows the IDLE Shell 3.11.4 window. The menu bar includes 'File', 'Edit', 'Shell', 'Debug', 'Options', 'Window', and 'Help'. The output of the program is:

```
Python 3.11.4 (tags/v3.11.4:d2340ef, Jun 7 2023, 05:45:37) [MSC v.1934 64 bit
(AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: F:\Aman Mondal\Practicals\9.py
'h': 0, 'H': 2
>>>
```

## Q10. Write a menu based program to perform PUSH, POP and DISPLAY operation on stack in python using list.

### Source Code:-

```
10.py - F:\Aman Mondal\Practicals\10.py (3.11.4)
File Edit Format Run Options Window Help

stack = []
def push():
    element= input("Enter element to push: ")
    stack.append(element)

def pop():
    if stack==[]:
        print("Stack is empty.")
    else:
        return stack.pop()

def display():
    if stack == []:
        print("Stack is empty.")
    else:
        print("Stack:", stack)

while True:
    print("\nMenu:")
    print("1. PUSH\n2. POP\n3. DISPLAY\n4. Exit")
    choice = int(input("Enter choice: "))

    if choice == 1:
        push()
    elif choice == 2:
        print("Popped element:", pop())
    elif choice == 3:
        display()
    elif choice == 4:
        break
    else:
        print("Invalid choice.")
```

### Output:-

```
Python 3.11.4 (tags/v3.11.4:d2340ef, Jun 7 2023, 05:45:37) [MSC v.1934 64 bit
(AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: F:\Aman Mondal\Practicals\10.py

Menu:
1. PUSH
2. POP
3. DISPLAY
4. Exit
Enter choice: 1
Enter element to push: 10

Menu:
1. PUSH
2. POP
3. DISPLAY
4. Exit
Enter choice: 3
Stack: ['10']

Menu:
1. PUSH
2. POP
3. DISPLAY
4. Exit
Enter choice: 2
Popped element: 10

Menu:
1. PUSH
2. POP
3. DISPLAY
4. Exit
Enter choice: 4
```

## Q11. Perform the following SQL queries

- i. Write a SQL query to create a table named Library with columns BookID, Title, Author, Genre, PublishedYear, and CopiesAvailable and. And perform the following questions
- ii. Write SQL queries to insert at least five records into the Library table.
- iii. Write a SQL query to update the number of available copies of a specific book (e.g., increase by 2).
- iv. Write a SQL query to delete a book record from the Library table where the BookID is a specific value.

Source Code And Output :-

```
MySQL 8.0 Command Line CLI x + -
Enter password: ****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 14
Server version: 8.0.36 MySQL Community Server - GPL

Copyright (c) 2000, 2024, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> use practical
Database changed
mysql> create table library ( BookID int(3) PRIMARY KEY, Title varchar(30), Author varchar(30),
-> Genre varchar(20), PublishedYear int(4), CopiesAvailable int(5));
Query OK, 0 rows affected, 3 warnings (0.03 sec)

mysql> insert into library values(001, "Harry Potter", "J.K. Rowling", "Fiction", 1997, 2000);
Query OK, 1 row affected (0.00 sec)

mysql> insert into library values(002, "Sherlock Holmes", "Conan Doyle", "Mystery", 1892, 1000);
Query OK, 1 row affected (0.00 sec)

mysql> insert into library values(003, "Dune", "Frank Herbert", "Fiction", 1965, 500);
Query OK, 1 row affected (0.00 sec)

mysql> update library set CopiesAvailable = CopiesAvailable+2 where BookID = 002;
Query OK, 1 row affected (0.00 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> delete from library where BookID = 003;
Query OK, 1 row affected (0.06 sec)
```

## Q12. Perform the following SQL queries

- Create two tables: Students (with columns StudentID, Name, Age, Class) and Marks (with columns StudentID, Subject, Score). Ensure that StudentID in Marks references StudentID in Students.
- Write SQL queries to insert at least three records into both the Students and Marks tables.
- Write a SQL query to find the average score of each student across all subjects and display the results with student names.
- Write a SQL query to delete a record from the Marks table for a student who has withdrawn from a subject.
- Write a SQL query to count the total number of students in each class.

### Source Code and Output:-

```
MySQL 8.0 Command Line CLI x + -
Enter password: ****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 16
Server version: 8.0.36 MySQL Community Server - GPL

Copyright (c) 2000, 2024, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> use practical
Database changed
mysql> create table Students ( StudentID int(4) PRIMARY KEY, Name varchar(30),
-> Age int, Class varchar(10));
Query OK, 0 rows affected, 1 warning (0.06 sec)

mysql> create table Marks (StudentID int, Subject varchar(100), Score int,
-> FOREIGN KEY (StudentID) REFERENCES Students(StudentID));
Query OK, 0 rows affected (0.04 sec)

mysql> insert into Students values (001, 'Aman', 17, '12-A'),
-> (002, 'Rohit', 16, '11-A'), (003, 'Karan', 17, '12-B');
Query OK, 3 rows affected (0.01 sec)
Records: 3 Duplicates: 0 Warnings: 0

mysql> insert into Marks values (001, 'Computer Science', 99),
-> (002, 'Computer Science', 90), (003, 'Computer Science', 95);
Query OK, 3 rows affected (0.00 sec)
Records: 3 Duplicates: 0 Warnings: 0

mysql> select name, AVG(Score) from Students,marks
-> where Students.StudentID = Marks.StudentID
-> group by name;
+-----+-----+
| name | AVG(Score) |
+-----+-----+
| Aman | 99.0000 |
| Rohit | 90.0000 |
| Karan | 95.0000 |
+-----+-----+
3 rows in set (0.01 sec)

mysql> delete from Marks where StudentID = 002 AND Subject = 'Computer Science';
Query OK, 1 row affected (0.00 sec)

mysql> select Class, COUNT(*) FROM Students GROUP BY Class;
+-----+-----+
| Class | COUNT(*) |
+-----+-----+
| 12-A | 1 |
| 11-A | 1 |
| 12-B | 1 |
+-----+-----+
3 rows in set (0.00 sec)
```



Q13. Write a Python program to connect to a MySQL database named SchoolDB.

```
import mysql.connector
connection = mysql.connector.connect(
    host='localhost', user='root',
    password='root', database='SchoolDB')
cursor = connection.cursor()
```

Q14. Write a SQL query to create a table named Students with the following columns: StudentID, Name, Age, and Class. Execute this query using a Python script.

```
def create_students_table():
    cursor.execute('''create table Students (StudentID int(4) PRIMARY KEY,
    Name VARCHAR(30), Age INT(2), Class VARCHAR(10))''')
```

Q15. Create a Python program that retrieves all records from the Students table and displays them in a formatted manner.

```
def retrieve_students():
    cursor.execute("select * from Students")
    rows = cursor.fetchall()
    for row in rows:
        print(f'''StudentID: {row[0]}, Name: {row[1]},
    Age: {row[2]}, Class: {row[3]}''')
```

Q16. Write a Python program that updates the age of a specific student in the Students table based on StudentID.

```
def update_student_age():
    student_id= int(input("Enter Student ID"))
    new_age = int(input("Enter new age"))
    cursor.execute("update Students set Age = %s WHERE StudentID = %s",
        (new_age, student_id))
    connection.commit()
```

Q17. Write a Python program that deletes a record from the Students table where the StudentID is a specific value.

```
def delete_student():
    student_id= int(input("Enter Student ID"))
    cursor.execute("delete from Students WHERE StudentID = %s",
        (student_id,))
    connection.commit()
```