TABLE OF CONTENTS

1. INTRODUCTION

In this assignment , I developed four applications in Python and C#. I developed a file extension information system and a contact book in C#. I wrote a hotel web-scraping application in Python which writes information to CSV file and a client-server application in Python to record student admission. These tasks helped me to practice programming, working with data, and solve real-life problems.

2. PART I: C# PROGRAMMING

2.1 Contact Book

In this assignment, I developed a C# contact book program . This project consisted of two files :

   a) Program.cs for the main menu and all functions.

   b) ContactBook.cs for the **ContactBook class**.

I created a **ContactBook** class with a name, company , phone , email and birthdate of each contact . The program starts with 20 contacts in an array . The menu lets the user to **add , view , update , or delete** a contact , also it checks that the phone number is 9 digits. I used basic **OOP concepts** and tested the program using **dotnet run** , which keeps going until the user exits .

EXPLORER   C Program.cs ●   C ContactBook.cs

∨ QUE.1   C Program.cs > ...
  > bin   class MainClass
  > obj
  ■ ConsoleApp1.csproj   PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS   POLYGLOT NOTEBOOK
  C ContactBook.cs
  C Program.cs   PS C:\Users\Admin\Desktop\sakshi120079303\Que.1> dotnet run
  ≣ Que.1.sln   Person13 lastname13 -- 12345678913
                          Person14 lastname14 -- 12345678914
                          Person15 lastname15 -- 12345678915
                          Person16 lastname16 -- 12345678916
                          Person17 lastname17 -- 12345678917
                          Person18 lastname18 -- 12345678918
                          Person19 lastname19 -- 12345678919
                          Person20 lastname20 -- 12345678920
                          Sakshi teli -- 123456789

                          --- Contact Book Menu ---
                           1. Add contact
                           2. Show All Contacts
                           3. Show one Contacts
                           4. Update Contact
                           5. Delete Contact
                           0. Exit
                           Enter Option
                          3
                          Enter Mobile Number :123456789

                          ---Contact Details ----
                          First Name :Sakshi
                          Last Name : teli
                          Company : TMV
                          Mobile : 123456789
                          Email : sakshi@gmail.com
                          Birthdate : 01-03-2004

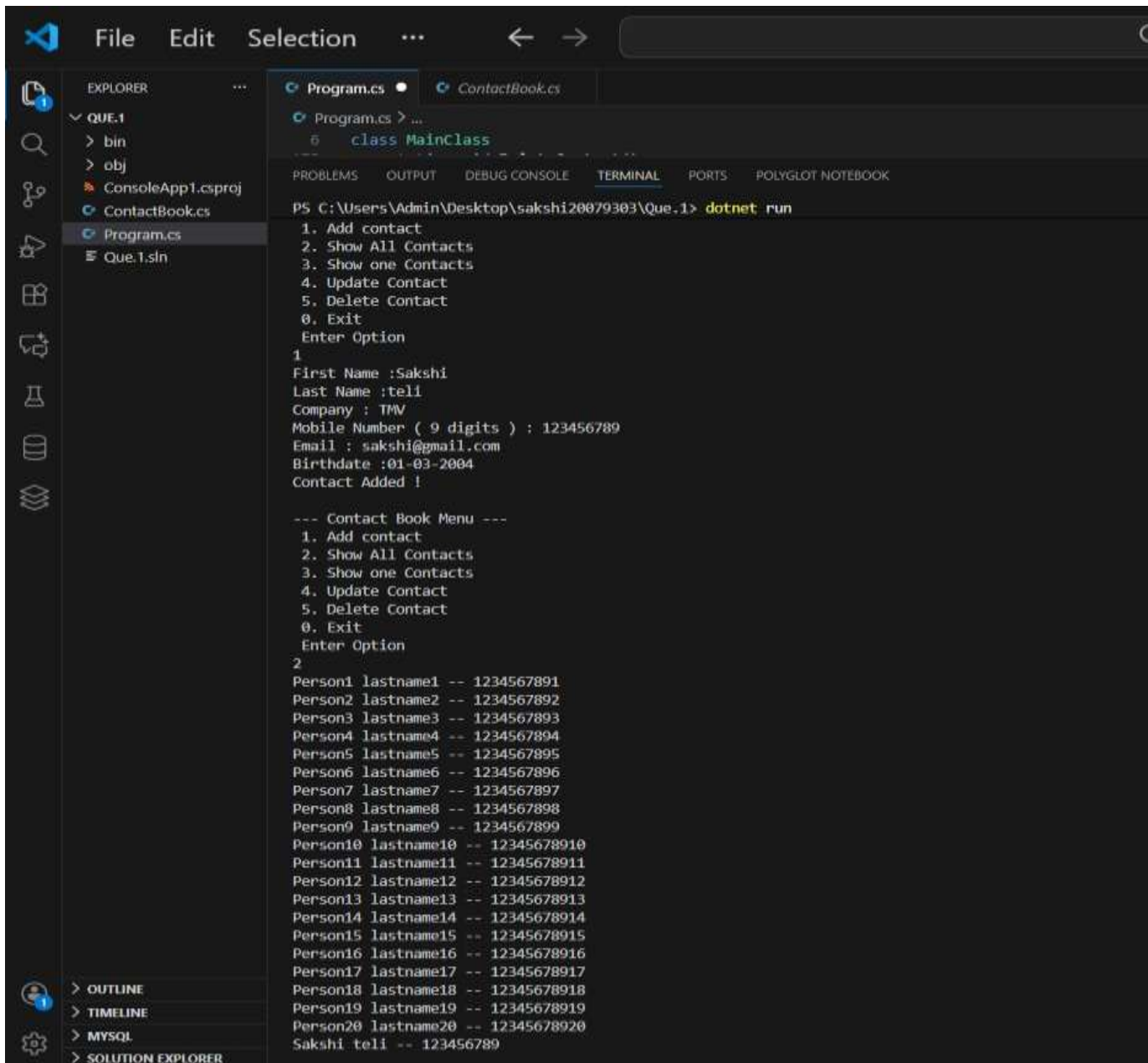   --- Contact Book Menu ---
                           1. Add contact
                           2. Show All Contacts
                           3. Show one Contacts
                           4. Update Contact
                           5. Delete Contact
                           0. Exit
                           Enter Option
                          4
                          Enter Mobile Number To Update : 123456789
                          New First Name :Tanvi
                          New Last Name :pashilkar
                          New Company :MTC
  > OUTLINE   New Email:tnavi@gmail.com
  > TIMELINE   New Birthdate :22-02-2004
  > MYSQL   Contact Updated !
  > SOLUTION EXPLORER   Contact Book Menu

EXPLORER   ···

∨ QUE.1
  > bin
  > obj
  ⟫ ConsoleApp1.csproj
  C⃝ ContactBook.cs
  C⃝ Program.cs
  ☰ Que.1.sln

C⃝ Program.cs ●   C⃝ ContactBook.cs

C⃝ Program.cs > ...
  6   class MainClass

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS   POLYGLOT NOTEBOOK

```
PS C:\Users\Admin\Desktop\sakshi20079303\Que.1> dotnet run
 1. Add contact
 2. Show All Contacts
 3. Show one Contacts
 4. Update Contact
 5. Delete Contact
 0. Exit
 Enter Option
1
First Name :Sakshi
Last Name :teli
Company : TMV
Mobile Number ( 9 digits ) : 123456789
Email : sakshi@gmail.com
Birthdate :01-03-2004
Contact Added !

--- Contact Book Menu ---
 1. Add contact
 2. Show All Contacts
 3. Show one Contacts
 4. Update Contact
 5. Delete Contact
 0. Exit
 Enter Option
2
Person1 lastname1 -- 1234567891
Person2 lastname2 -- 1234567892
Person3 lastname3 -- 1234567893
Person4 lastname4 -- 1234567894
Person5 lastname5 -- 1234567895
Person6 lastname6 -- 1234567896
Person7 lastname7 -- 1234567897
Person8 lastname8 -- 1234567898
Person9 lastname9 -- 1234567899
Person10 lastname10 -- 12345678910
Person11 lastname11 -- 12345678911
Person12 lastname12 -- 12345678912
Person13 lastname13 -- 12345678913
Person14 lastname14 -- 12345678914
Person15 lastname15 -- 12345678915
Person16 lastname16 -- 12345678916
Person17 lastname17 -- 12345678917
Person18 lastname18 -- 12345678918
Person19 lastname19 -- 12345678919
Person20 lastname20 -- 12345678920
Sakshi teli -- 123456789
```

> OUTLINE
> TIMELINE
> MYSQL
> SOLUTION EXPLORER

File Edit Selection ··· ← → 🔍 Que.1

EXPLORER ···
∨ QUE.1
  > bin
  > obj
  ● ConsoleApp1.csproj
  ● ContactBook.cs
  ● Program.cs
  ≡ Que.1.sln

● Program.cs ● ● ContactBook.cs

● Program.cs > ...
  6   class MainClass

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS POLYGLOT NOTEBOOK

```
PS C:\Users\Admin\Desktop\sakshi20079303\Que.1> dotnet run
 4. Update Contact
 5. Delete Contact
 0. Exit
 Enter Option
5
 Enter Mobile Number To Delete : 123456789
 Contact Deleted !

--- Contact Book Menu ---
 1. Add contact
 2. Show All Contacts
 3. Show one Contacts
 4. Update Contact
 5. Delete Contact
 0. Exit
 Enter Option
2
Person1 lastname1 -- 1234567891
Person2 lastname2 -- 1234567892
Person3 lastname3 -- 1234567893
Person4 lastname4 -- 1234567894
Person5 lastname5 -- 1234567895
Person6 lastname6 -- 1234567896
Person7 lastname7 -- 1234567897
Person8 lastname8 -- 1234567898
Person9 lastname9 -- 1234567899
Person10 lastname10 -- 12345678910
Person11 lastname11 -- 12345678911
Person12 lastname12 -- 12345678912
Person13 lastname13 -- 12345678913
Person14 lastname14 -- 12345678914
Person15 lastname15 -- 12345678915
Person16 lastname16 -- 12345678916
Person17 lastname17 -- 12345678917
Person18 lastname18 -- 12345678918
Person19 lastname19 -- 12345678919
Person20 lastname20 -- 12345678920

--- Contact Book Menu ---
 1. Add contact
 2. Show All Contacts
 3. Show one Contacts
 4. Update Contact
 5. Delete Contact
 0. Exit
 Enter Option
```

> OUTLINE
> TIMELINE
> MYSQL

6

2.2 File Extension System

In response to this question, I created a C# console application that displays the information about different file extensions. In this project .

I was working with two files :

a) **Program. cs** – The menu and all functions are contained here.

b) **FileExtension. cs** – The class contains the FileExtension .

FileExtension class contains two aspects:

a) The file extension (like .mp4,.pdf)

b) Its description (like video file, document , audio file)

I did a program where 20 default file extensions were created by default with the help of the **AddDefaultExtension()** method. The menu will allow the user to **view , add, delete ,update** or search an extension . In case the user enters an extension but forgets to add a dot , the program will add it automatically . In case there is no extension , a message stating not found is displayed . I was able to apply simple OOP principles such as classes , objects , and methods and debugged all of them by dotnet run .

File   Edit   Selection   ···   ←   →

EXPLORER   ···   C Program.cs ●   C FileExtension.cs

∨ QUE.2   ConsoleApp1 > C Program.cs > ...
  ∨ ConsoleApp1   5   class MainClass
    > bin
    > obj   PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS   POLYGLOT NOTEBOOK
    ConsoleApp1.csproj
    FileExtension.cs   ● PS C:\Users\Admin\Desktop\sakshi20079303\Que.2> cd "C:\Users\Admin\Desktop\sakshi20079303\Que.2\ConsoleApp1"
    C Program.cs   >>
    ≡ ConsoleApp1.sln   ○ PS C:\Users\Admin\Desktop\sakshi20079303\Que.2\ConsoleApp1> dotnet run

                          ---File Extension ---
                           1.Show All Extensions
                           2.Show One Extensions
                           3.Add Extensions
                           4.Update Extensions
                           5.Delete Extensions
                           0.Exit
                          Enter option: 1

                            Supported Extensions :
                          .mp4 - Video File
                          .avi - Video File
                          .mov - Video File
                          .mkv - Video File
                          .webm - Video File
                          .mp3 - Audio File
                          .wav - Audio File
                          .flac - Audio File
                          .jpg - Image File
                          .jpeg - Image File
                          .png - Image File
                          .gif - Image File
                          .pdf - Document
                          .docx - Word Document
                          .xlsx - Excel Sheet
                          .pptx - PowerPoint
                          .txt - Text File
                          .zip - Compressed File
                          .rar - Compressed File
                          .7z - Compressed File

                          ---File Extension ---
                           1.Show All Extensions
                           2.Show One Extensions
                           3.Add Extensions
                           4.Update Extensions
                           5.Delete Extensions
                           0.Exit
                          Enter option: 2
                            Enter Extension : .7z
                          Extension : .7z
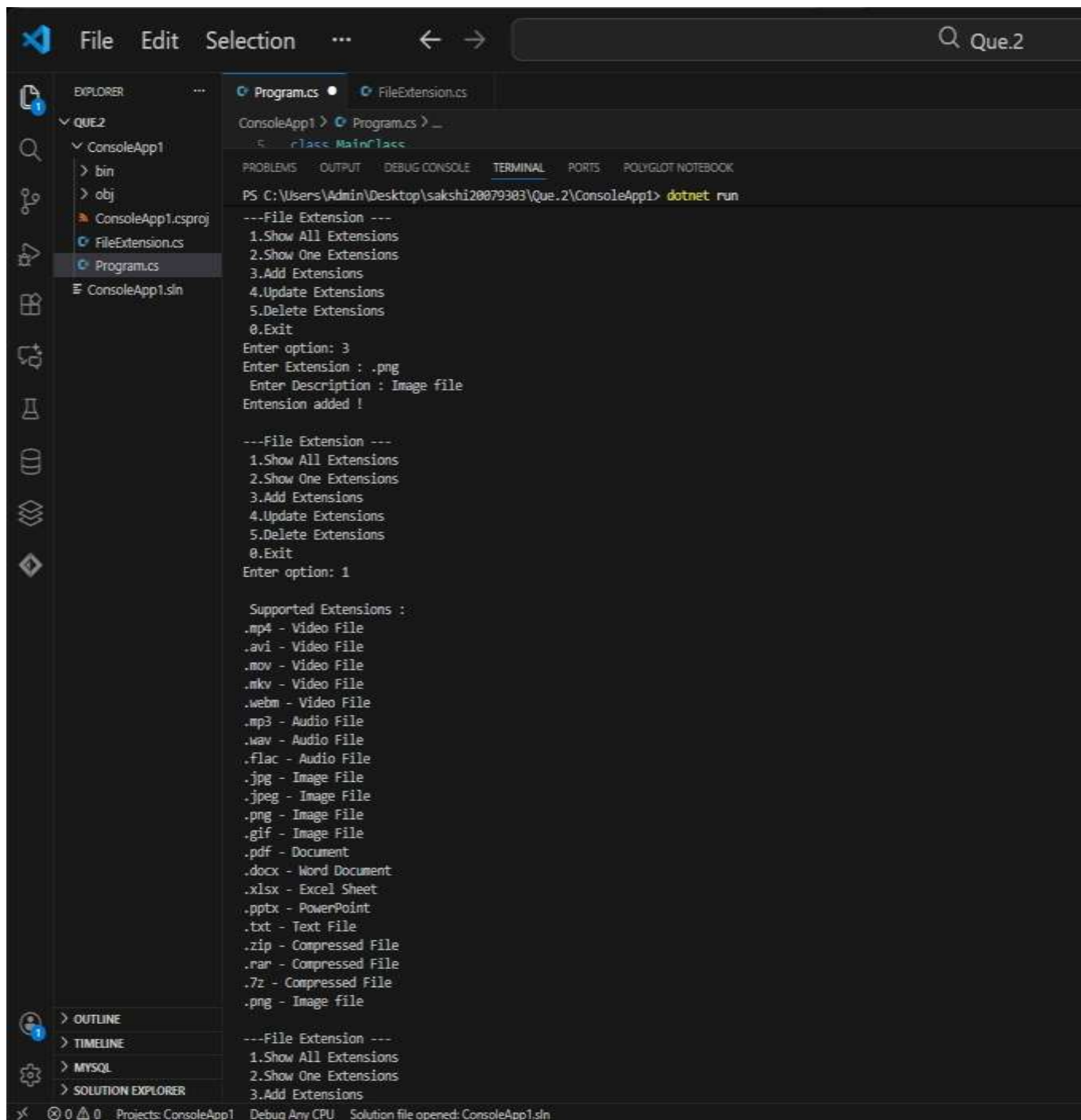   Description: Compressed File

                          ---File Extension ---
                           1.Show All Extensions
> OUTLINE
> TIMELINE
> MYSQL
> SOLUTION EXPLORER

⊗ 0 ⚠ 0   Projects: ConsoleApp1   Debug Any CPU   Solution file opened: ConsoleApp1.sln

File   Edit   Selection   ···   ← →

EXPLORER   ···

Program.cs ●   FileExtension.cs

∨ QUE.2

ConsoleApp1 > Program.cs > ...

∨ ConsoleApp1

5   class MainClass

> bin

> obj

PROBLEMS   OUTPUT   DEBUG CONSOLE   **TERMINAL**   PORTS   POLYGLOT NOTEBOOK

ConsoleApp1.csproj

FileExtension.cs

Program.cs

PS C:\Users\Admin\Desktop\sakshi20079303\Que.2\ConsoleApp1> dotnet run

≡ ConsoleApp1.sln

```
---File Extension ---
 1.Show All Extensions
 2.Show One Extensions
 3.Add Extensions
 4.Update Extensions
 5.Delete Extensions
 0.Exit
Enter option: 3
Enter Extension : .png
 Enter Description : Image file
Entension added !

---File Extension ---
 1.Show All Extensions
 2.Show One Extensions
 3.Add Extensions
 4.Update Extensions
 5.Delete Extensions
 0.Exit
Enter option: 1

 Supported Extensions :
.mp4 - Video File
.avi - Video File
.mov - Video File
.mkv - Video File
.webm - Video File
.mp3 - Audio File
.wav - Audio File
.flac - Audio File
.jpg - Image File
.jpeg - Image File
.png - Image File
.gif - Image File
.pdf - Document
.docx - Word Document
.xlsx - Excel Sheet
.pptx - PowerPoint
.txt - Text File
.zip - Compressed File
.rar - Compressed File
.7z - Compressed File
.png - Image file

---File Extension ---
 1.Show All Extensions
 2.Show One Extensions
 3.Add Extensions
```
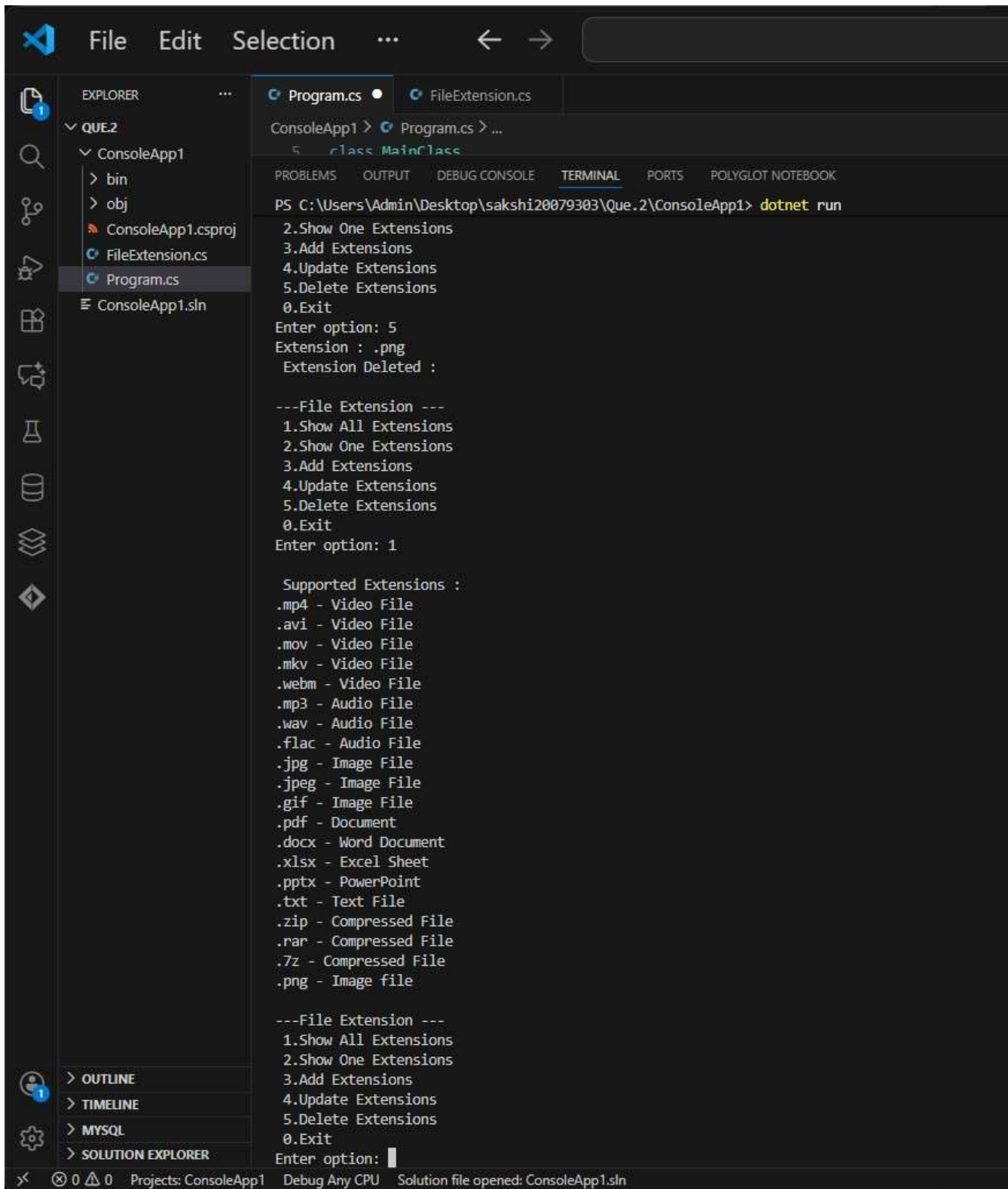
> OUTLINE

> TIMELINE

> MYSQL

> SOLUTION EXPLORER

⊗ 0 △ 0   Projects: ConsoleApp1   Debug Any CPU   Solution file opened: ConsoleApp1.sln

EXPLORER   ···

∨ QUE.2
  ∨ ConsoleApp1
    > bin
    > obj
    ⋫ ConsoleApp1.csproj
    ⦿ FileExtension.cs
    ⦿ Program.cs
  ≡ ConsoleApp1.sln

⦿ Program.cs ●   ⦿ FileExtension.cs

ConsoleApp1 > ⦿ Program.cs > ...
  5   class MainClass

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS   POLYGLOT NOTEBOOK

```
PS C:\Users\Admin\Desktop\sakshi20079303\Que.2\ConsoleApp1> dotnet run
 2.Show One Extensions
 3.Add Extensions
 4.Update Extensions
 5.Delete Extensions
 0.Exit
Enter option: 4
Extension : .png
New Description : Picture
 Extension Updated

---File Extension ---
 1.Show All Extensions
 2.Show One Extensions
 3.Add Extensions
 4.Update Extensions
 5.Delete Extensions
 0.Exit
Enter option: 1

 Supported Extensions :
.mp4 - Video File
.avi - Video File
.mov - Video File
.mkv - Video File
.webm - Video File
.mp3 - Audio File
.wav - Audio File
.flac - Audio File
.jpg - Image File
.jpeg - Image File
.png - Picture
.gif - Image File
.pdf - Document
.docx - Word Document
.xlsx - Excel Sheet
.pptx - PowerPoint
.txt - Text File
.zip - Compressed File
.rar - Compressed File
.7z - Compressed File
.png - Image file

---File Extension ---
 1.Show All Extensions
 2.Show One Extensions
 3.Add Extensions
 4.Update Extensions
 5.Delete Extensions
```

> OUTLINE
> TIMELINE
> MYSQL
> SOLUTION EXPLORER
⊗ 0 ⚠ 0   Projects: ConsoleApp1   Debug Any CPU   Solution file opened: ConsoleApp1.sln

File   Edit   Selection   ···   ← →

∨ QUE.2

∨ ConsoleApp1

  > bin

  > obj

  ⟩ ConsoleApp1.csproj

  C⁺ FileExtension.cs

  C⁺ Program.cs

≡ ConsoleApp1.sln

C⁺ Program.cs ●   C⁺ FileExtension.cs

ConsoleApp1 > C⁺ Program.cs > ...

  5   class MainClass

PROBLEMS   OUTPUT   DEBUG CONSOLE   **TERMINAL**   PORTS   POLYGLOT NOTEBOOK

```
PS C:\Users\Admin\Desktop\sakshi20079303\Que.2\ConsoleApp1> dotnet run
 2.Show One Extensions
 3.Add Extensions
 4.Update Extensions
 5.Delete Extensions
 0.Exit
Enter option: 5
Extension : .png
 Extension Deleted :

---File Extension ---
 1.Show All Extensions
 2.Show One Extensions
 3.Add Extensions
 4.Update Extensions
 5.Delete Extensions
 0.Exit
Enter option: 1

 Supported Extensions :
.mp4 - Video File
.avi - Video File
.mov - Video File
.mkv - Video File
.webm - Video File
.mp3 - Audio File
.wav - Audio File
.flac - Audio File
.jpg - Image File
.jpeg - Image File
.gif - Image File
.pdf - Document
.docx - Word Document
.xlsx - Excel Sheet
.pptx - PowerPoint
.txt - Text File
.zip - Compressed File
.rar - Compressed File
.7z - Compressed File
.png - Image file

---File Extension ---
 1.Show All Extensions
 2.Show One Extensions
 3.Add Extensions
 4.Update Extensions
 5.Delete Extensions
 0.Exit
Enter option:
```

> OUTLINE

> TIMELINE

> MYSQL

> SOLUTION EXPLORER

⊗ 0 ⚠ 0   Projects: ConsoleApp1   Debug Any CPU   Solution file opened: ConsoleApp1.sln

3. PART II: PYTHON PROGRAMMING

3.1 Client–Server Application

I created a server program based on **Python Sockets**, which waits to have a client . I created a client program that sends information about student admission to the server . I used **SQLite** to create a database file that contains all of the student data .

Once the data is received by the server , a unique application number is created and stored . The server sends the application number to the client . The client is sent back the application number by the server. The client shows the application number to the user . This work makes use of **databases, TCP communication and basic string manipulation**.

3.2 Web Scraping and CSV Handling

I created two sample **Hotel Webpages (hotelA.html and hotelB.html)** containing the names of rooms and prices since scraping of actual hotel websites is not possible . Then I wrote Python program which scraped these two pages with **BeautifulSoup** and collected the room data which was then stored in a CSV file and finally read the CSV file to display the results . This also enabled me to show safe and legal web scraping .

webScraping.py X

Que.4 > 🐍 webScraping.py > ...

Ω 1   import requests

PROBLEMS   OUTPUT   DEBUG CONSOLE   **TERMINAL**   PORTS   POLYGLOT NOTEBOOK   powershell - Que.4

EXPLORER ···

∨ SAKSHI20079303
  > Que.1
  > Que.2
  ∨ Que.3
    🗄 Admission.db
    🐍 Que3_client.py
    🐍 Que3_server.py
  ∨ Que.4
    <> hotelA.html
    <> hotelB.html
    📊 HotelRooms.csv
    🐍 webScraping.py
  📘 ~$(CA1) Report(Saks...
  🕓 ~WRL0003.tmp
  📘 AP(CA1) Report(Saks...
  ≡ sakshi20079303.sln

> OUTLINE
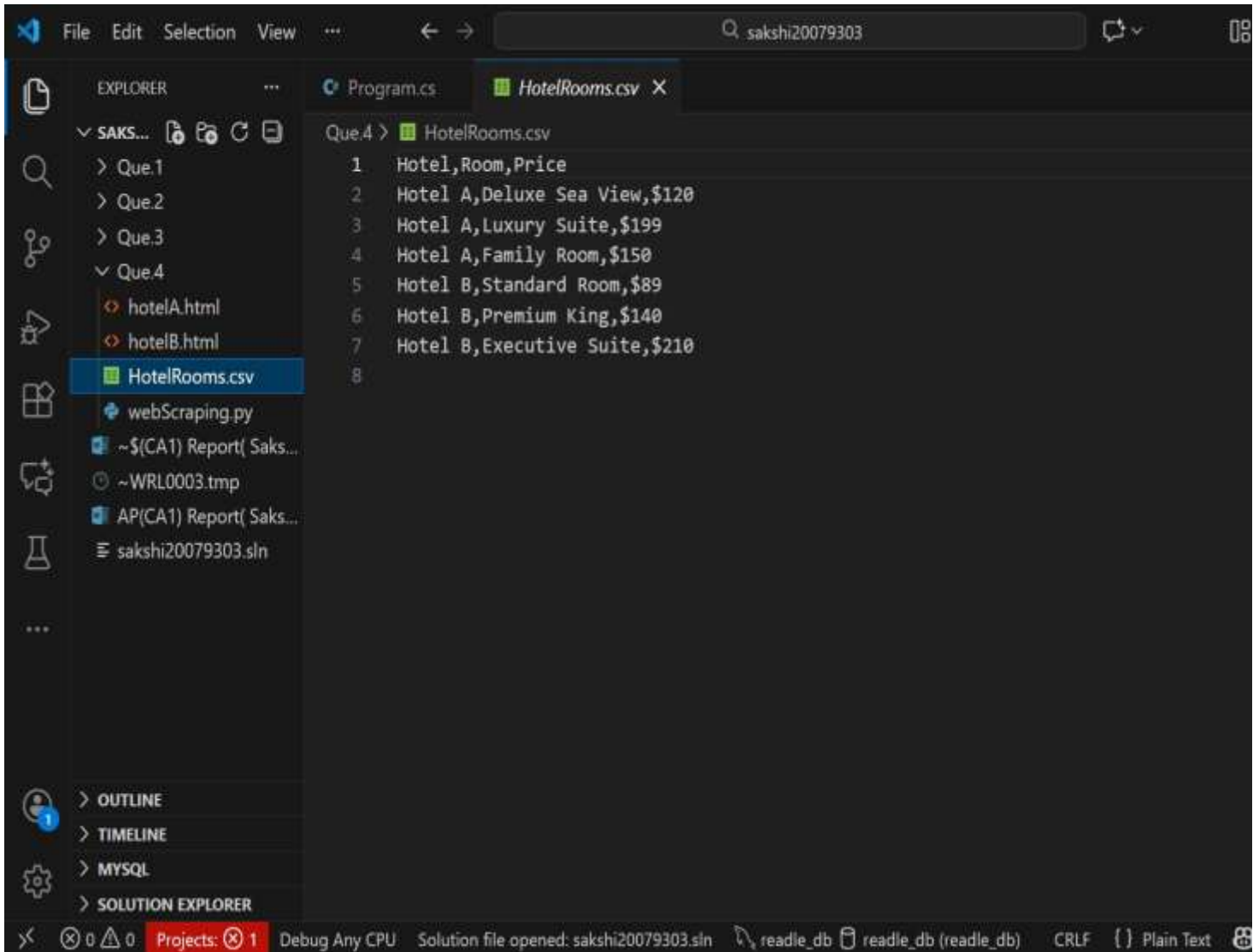> TIMELINE
> MYSQL
> SOLUTION EXPLORER

```
PS C:\Users\Admin\Desktop\sakshi20079303> cd C:\Users\Admin\Desktop\sakshi20079303\Que.4
PS C:\Users\Admin\Desktop\sakshi20079303\Que.4> python webScraping.py
Scraping Hotel A...
Scraping Hotel B...
Saving to csv...
CSV saved as HotelRooms.csv

Reading csv data:

{'Hotel': 'Hotel A', 'Room': 'Deluxe Sea View', 'Price': '$120'}
{'Hotel': 'Hotel A', 'Room': 'Luxury Suite', 'Price': '$199'}
{'Hotel': 'Hotel A', 'Room': 'Family Room', 'Price': '$150'}
{'Hotel': 'Hotel B', 'Room': 'Standard Room', 'Price': '$89'}
{'Hotel': 'Hotel B', 'Room': 'Premium King', 'Price': '$140'}
{'Hotel': 'Hotel B', 'Room': 'Executive Suite', 'Price': '$210'}

Done!
PS C:\Users\Admin\Desktop\sakshi20079303\Que.4>
```

EXPLORER   ···   C# Program.cs   ▦ *HotelRooms.csv* ✕

∨ SAKS... 🗋 🗐 C 🗀   Que.4 ⟩ ▦ HotelRooms.csv
  > Que.1   1   Hotel,Room,Price
  > Que.2   2   Hotel A,Deluxe Sea View,$120
  > Que.3   3   Hotel A,Luxury Suite,$199
  ∨ Que.4   4   Hotel A,Family Room,$150
    <> hotelA.html   5   Hotel B,Standard Room,$89
    <> hotelB.html   6   Hotel B,Premium King,$140
    ▦ HotelRooms.csv   7   Hotel B,Executive Suite,$210
    🐍 webScraping.py 8
  ▧ ~$(CA1) Report(Saks...
  🕒 ~WRL0003.tmp
  ▧ AP(CA1) Report(Saks...
  ≡ sakshi20079303.sln

> OUTLINE
> TIMELINE
> MYSQL
> SOLUTION EXPLORER

4. CONCLUSION

I was able to practice C# and Python by creating basic applications for this assignment. I learned how to   use OOP , data management , database administration , and client-server communication.

5. REFERENCE

a) **Microsoft. (2024)** *C# Documentation: Classes and Objects.* Available at:
    https://learn.microsoft.com/en-us/dotnet/csharp/fundamentals/object-oriented/classes

b) **Python Software Foundation. (2024)** *socket — Low-level networking interface.*
    Available at: https://docs.python.org/3/library/socket.html

c) **SQLite. (2024)** *SQLite Language Documentation.* Available at:
    https://www.sqlite.org/lang.html

6. GITHUB REPOSITORY LINK

https://github.com/sakshi220122/sakshiteli20079303-AdvanceProgrammingCA1-.git