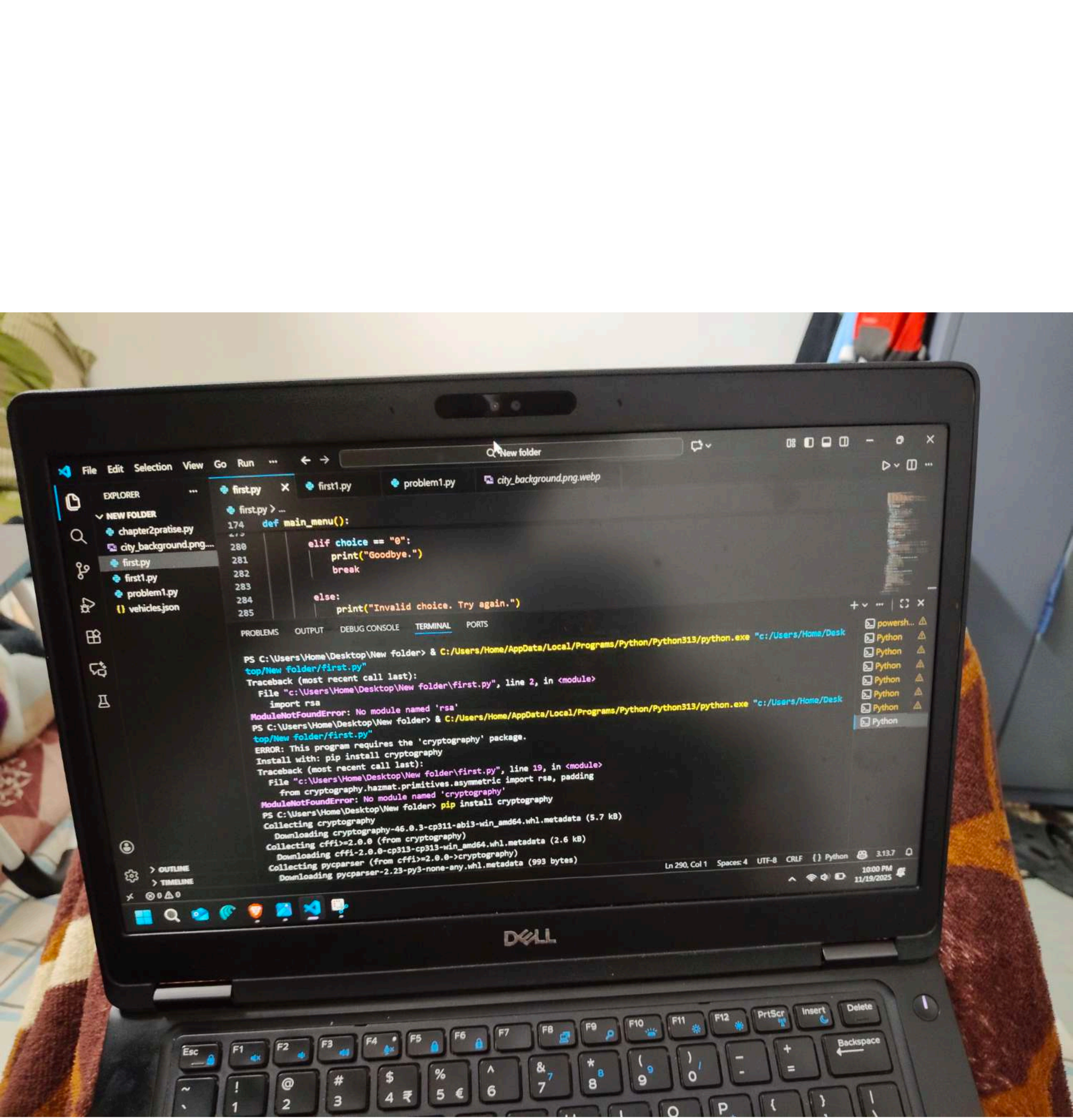
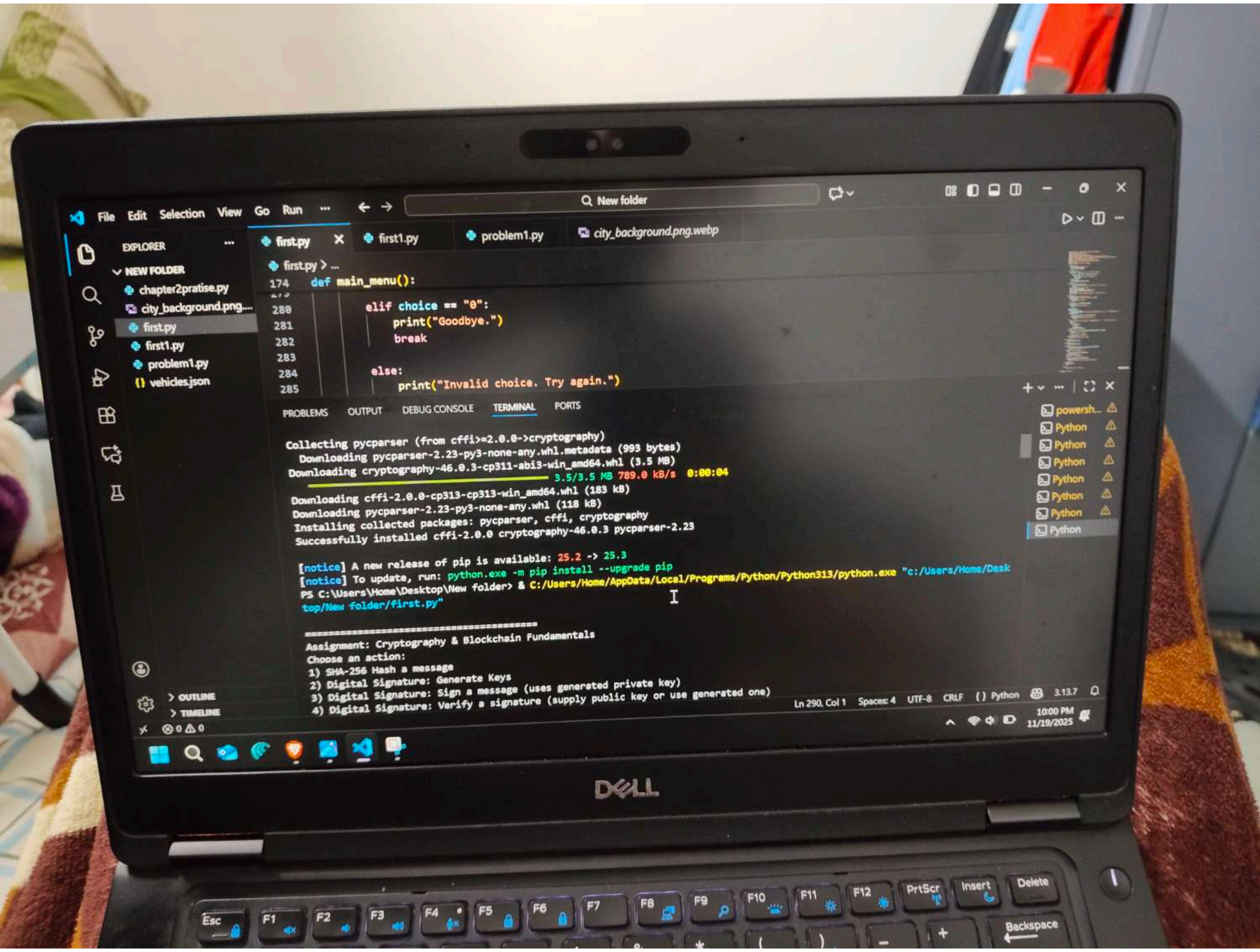
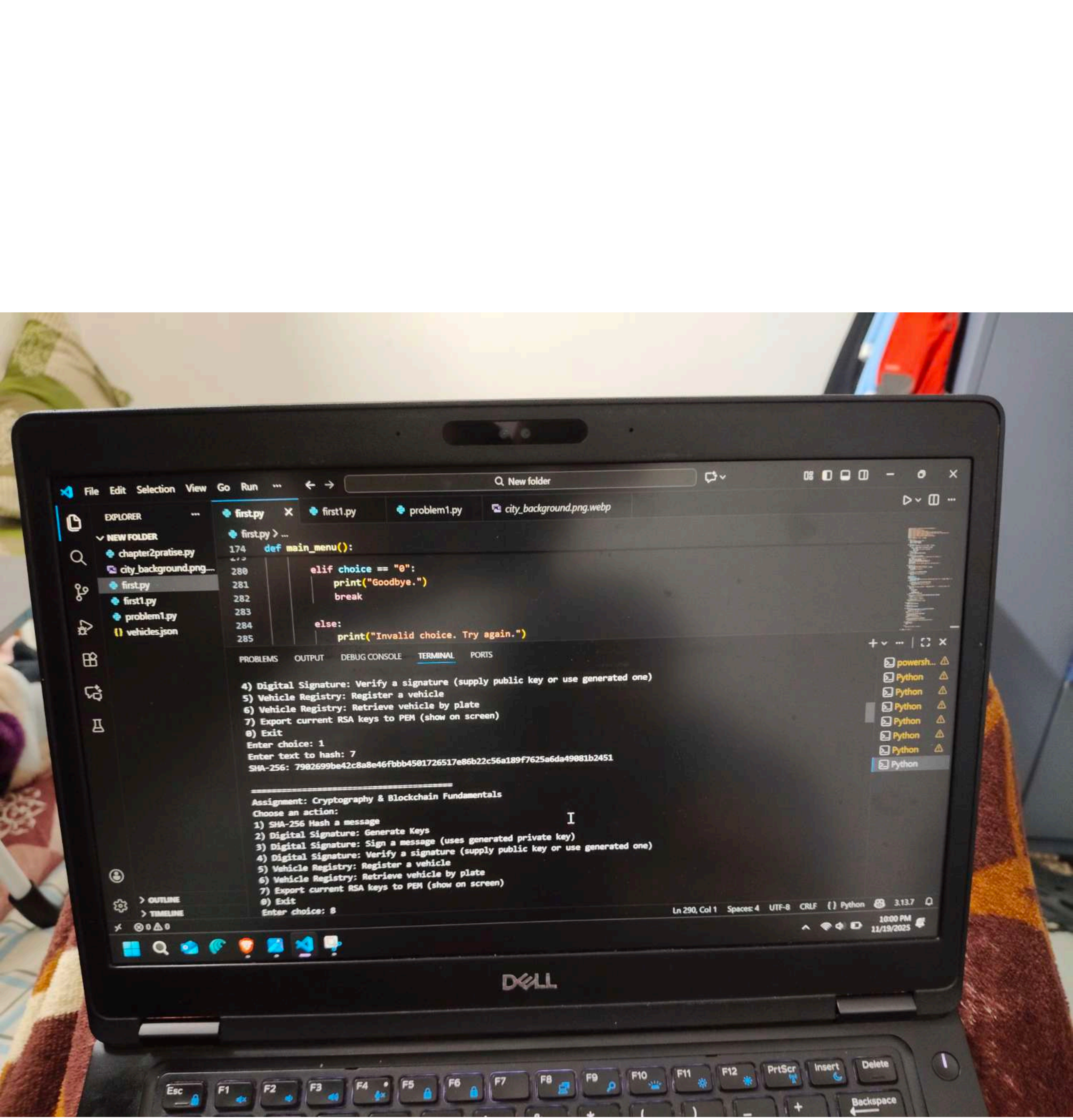
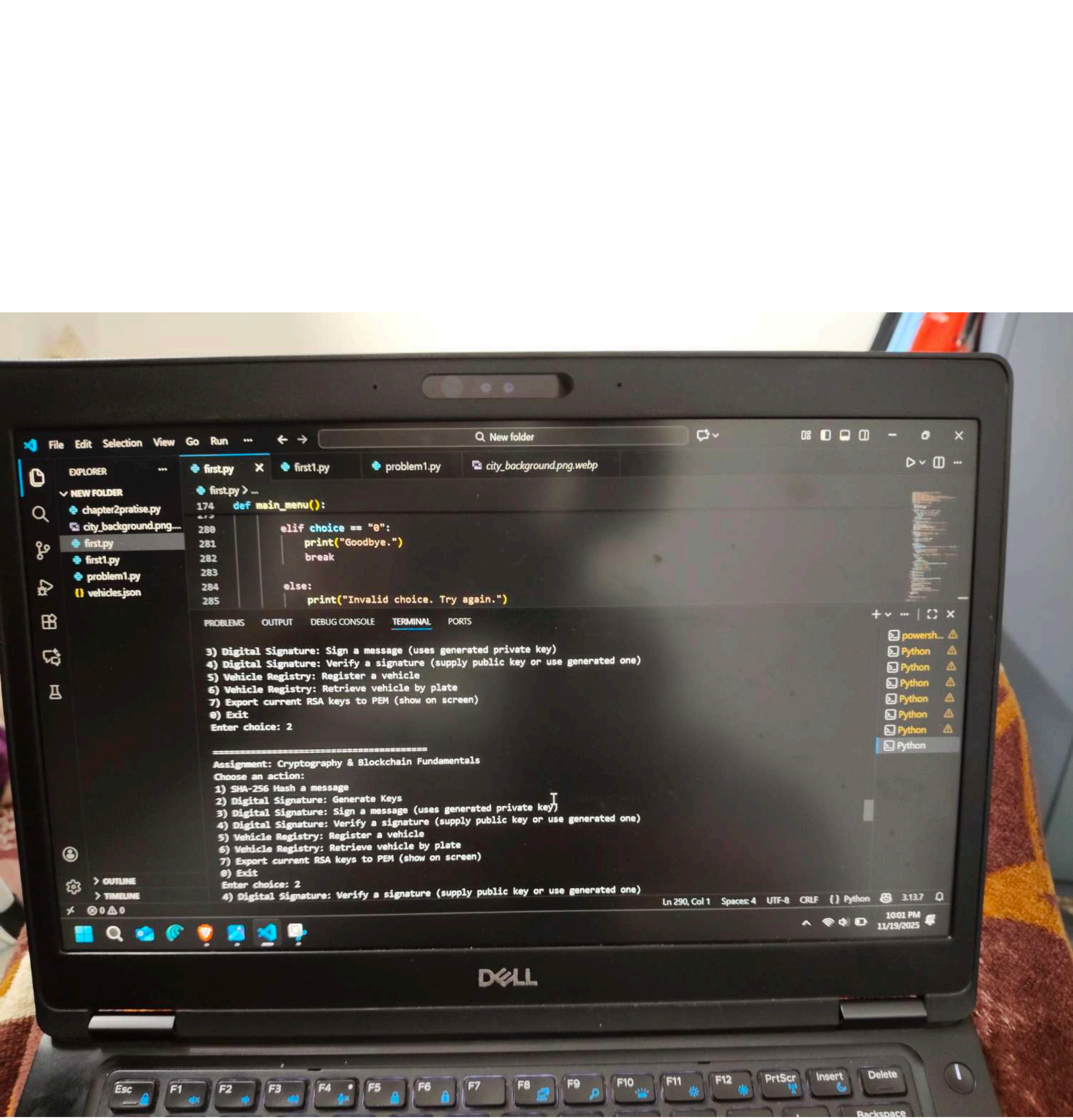

File Edit Selection View Go Run
New folder
EXPLORER
NEW FOLDER
chapter2pratise.py
city_background.png....
first.py
first1.py
problem1.py
vehicles.json
first.py
first1.py
problem1.py
city_background.png.webp
174 def main_menu():
280 elif choice == "0":
281 print("Goodbye.")
282 break
283
284 else:
285 print("Invalid choice. Try again.")
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS C:\Users\Home\Desktop\New folder> & C:/Users/Home/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/Home/Desktop/New folder/first.py"
Traceback (most recent call last):
File "c:\Users\Home\Desktop\New folder\first.py", line 2, in <module>
import rsa
ModuleNotFoundError: No module named 'rsa'
PS C:\Users\Home\Desktop\New folder> & C:/Users/Home/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/Home/Desktop/New folder/first.py"
ERROR: This program requires the 'cryptography' package.
Install with: pip install cryptography
Traceback (most recent call last):
File "c:\Users\Home\Desktop\New folder\first.py", line 19, in <module>
from cryptography.hazmat.primitives.asymmetric import rsa, padding
ModuleNotFoundError: No module named 'cryptography'
PS C:\Users\Home\Desktop\New folder> pip install cryptography
Collecting cryptography
Downloading cryptography-46.0.3-cp311-abi3-win_amd64.whl.metadata (5.7 kB)
Collecting cffi>=2.0.0 (from cryptography)
Downloading cffi-2.0.0-cp313-cp313-win_amd64.whl.metadata (2.6 kB)
Collecting pycparser (from cffi>=2.0.0->cryptography)
Downloading pycparser-2.23-py3-none-any.whl.metadata (993 bytes)
powersh...
Python
OUTLINE
TIMELINE
Ln 290, Col 1 Spaces: 4 UTF-8 CRLF { } Python 3.13.7
10:00 PM 11/19/2025
DELL
Esc F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12 PrtScr Insert Delete
Backspace

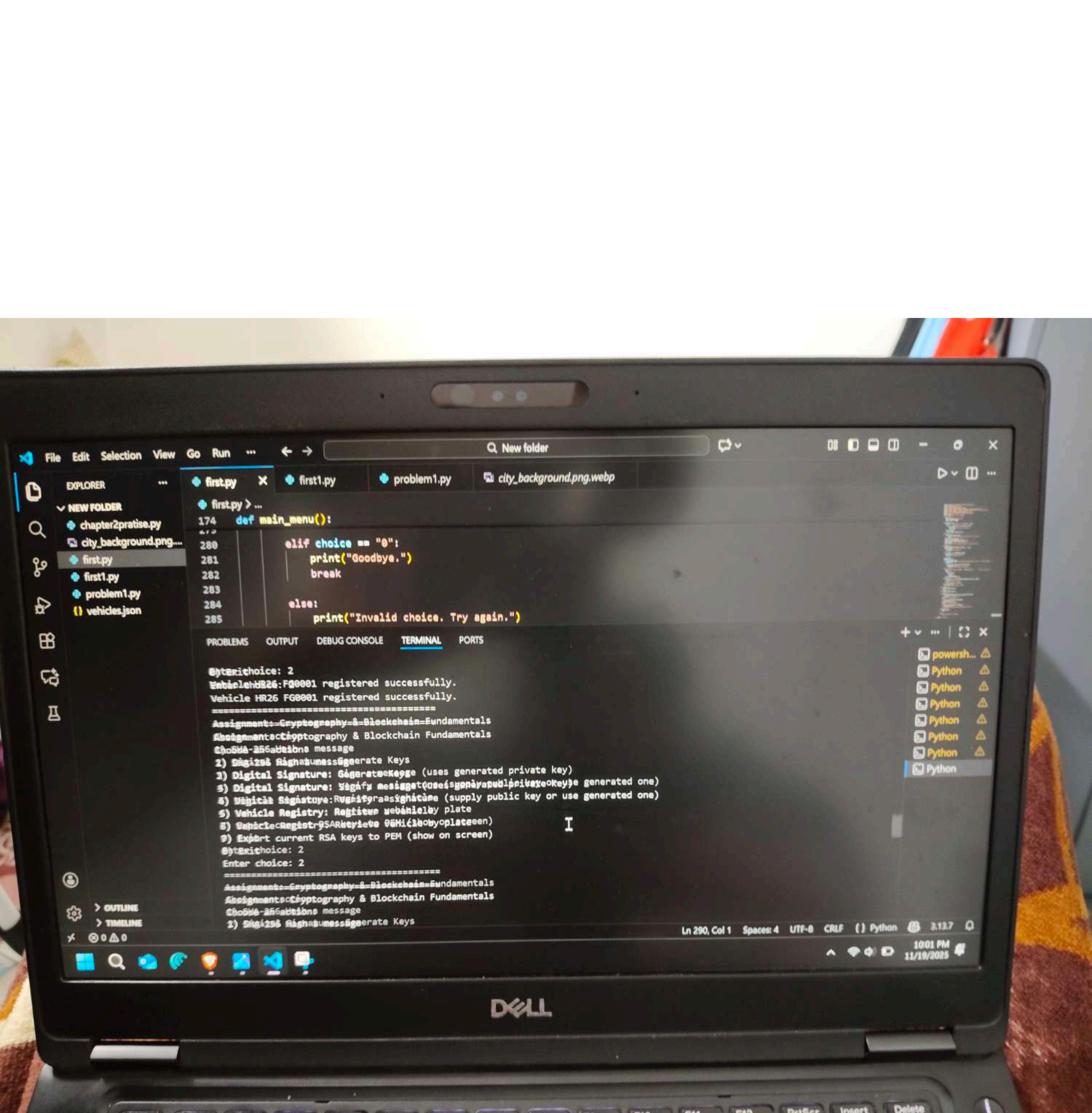

File Edit Selection View Go Run
New folder
EXPLORER
NEW FOLDER
chapter2pratise.py
city_background.png....
first.py
first1.py
problem1.py
vehicles.json
first.py
first1.py
problem1.py
city_background.png.webp
first.py > ...
174 def main_menu():
280 elif choice == "0":
281 print("Goodbye.")
282 break
283
284 else:
285 print("Invalid choice. Try again.")
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Collecting pycparser (from cffi>=2.0.0->cryptography)
Downloading pycparser-2.23-py3-none-any.whl.metadata (993 bytes)
Downloading cryptography-46.0.3-cp311-abi3-win_amd64.whl (3.5 MB)
3.5/3.5 MB 789.0 kB/s 0:00:04
Downloading cffi-2.0.0-cp313-cp313-win_amd64.whl (183 kB)
Downloading pycparser-2.23-py3-none-any.whl (118 kB)
Installing collected packages: pycparser, cffi, cryptography
Successfully installed cffi-2.0.0 cryptography-46.0.3 pycparser-2.23
[notice] A new release of pip is available: 25.2 -> 25.3
[notice] To update, run: python.exe -m pip install --upgrade pip
PS C:\Users\Home\Desktop\New folder> & C:/Users/Home/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/Home/Desktop/New folder/first.py"
Assignment: Cryptography & Blockchain Fundamentals
Choose an action:
1) SHA-256 Hash a message
2) Digital Signature: Generate Keys
3) Digital Signature: Sign a message (uses generated private key)
4) Digital Signature: Verify a signature (supply public key or use generated one)
powersh...
Python
Ln 290, Col 1 Spaces: 4 UTF-8 CRLF { } Python 3.13.7
10:00 PM 11/19/2025
DELL


File Edit Selection View Go Run
New folder
EXPLORER
NEW FOLDER
chapter2pratise.py
city_background.png...
first.py
first1.py
problem1.py
vehicles.json
first.py
first1.py
problem1.py
city_background.png.webp
first.py > ...
174 def main_menu():
280 elif choice == "0":
281 print("Goodbye.")
282 break
283
284 else:
285 print("Invalid choice. Try again.")
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
4) Digital Signature: Verify a signature (supply public key or use generated one)
5) Vehicle Registry: Register a vehicle
6) Vehicle Registry: Retrieve vehicle by plate
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice: 1
Enter text to hash: 7
SHA-256: 7902699be42c8a8e46fbbb4501726517e86b22c56a189f7625a6da49081b2451
Assignment: Cryptography & Blockchain Fundamentals
Choose an action:
1) SHA-256 Hash a message
2) Digital Signature: Generate Keys
3) Digital Signature: Sign a message (uses generated private key)
4) Digital Signature: Verify a signature (supply public key or use generated one)
5) Vehicle Registry: Register a vehicle
6) Vehicle Registry: Retrieve vehicle by plate
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice: 8
powersh...
Python
Python
Python
Python
Python
Python
Python
OUTLINE
TIMELINE
Ln 290, Col 1 Spaces: 4 UTF-8 CRLF { } Python 3.13.7
10:00 PM
11/19/2025
DELL
Esc F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12 PrtScr Insert Delete
Backspace

```
def main_menu():
        elif choice == "0":
            print("Goodbye.")
            break

        else:
            print("Invalid choice. Try again.")
```

```
6) Vehicle Registry: Retrieve vehicle by plate
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice: 8
Invalid choice. Try again.

==========================================
Assignment: Cryptography & Blockchain Fundamentals
Choose an action:
1) SHA-256 Hash a message
2) Digital Signature: Generate Keys
3) Digital Signature: Sign a message (uses generated private key)
4) Digital Signature: Verify a signature (supply public key or use generated one)
5) Vehicle Registry: Register a vehicle
6) Vehicle Registry: Retrieve vehicle by plate
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice: 8
Invalid choice. Try again.

==========================================
```


File Edit Selection View Go Run
New folder
EXPLORER
NEW FOLDER
chapter2pratise.py
city_background.png....
first.py
first1.py
problem1.py
vehicles.json
first.py
first1.py
problem1.py
city_background.png.webp
174 def main_menu():
280 elif choice == "0":
281 print("Goodbye.")
282 break
283
284 else:
285 print("Invalid choice. Try again.")
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
3) Digital Signature: Sign a message (uses generated private key)
4) Digital Signature: Verify a signature (supply public key or use generated one)
5) Vehicle Registry: Register a vehicle
6) Vehicle Registry: Retrieve vehicle by plate
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice: 2
Assignment: Cryptography & Blockchain Fundamentals
Choose an action:
1) SHA-256 Hash a message
2) Digital Signature: Generate Keys
3) Digital Signature: Sign a message (uses generated private key)
4) Digital Signature: Verify a signature (supply public key or use generated one)
5) Vehicle Registry: Register a vehicle
6) Vehicle Registry: Retrieve vehicle by plate
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice: 2
4) Digital Signature: Verify a signature (supply public key or use generated one)
powersh...
Python
Python
Python
Python
Python
Python
Python
OUTLINE
TIMELINE
Ln 290, Col 1 Spaces: 4 UTF-8 CRLF { } Python 3.13.7
10:01 PM
11/19/2025
DELL
Esc F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12 PrtScr Insert Delete
Backspace

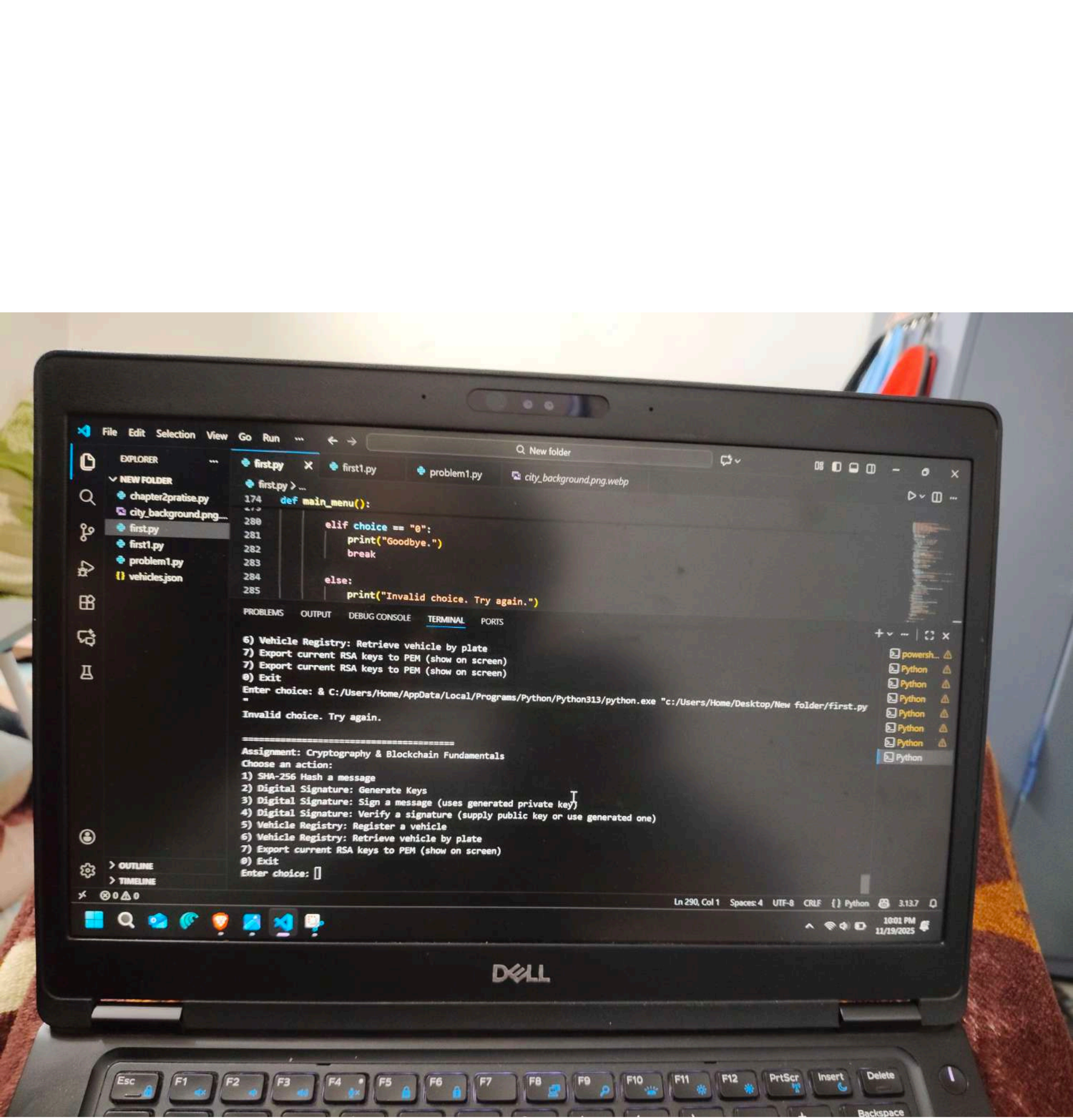

File Edit Selection View Go Run
New folder
EXPLORER
NEW FOLDER
chapter2pratise.py
city_background.png....
first.py
first1.py
problem1.py
vehicles.json
first.py
first1.py
problem1.py
city_background.png.webp
first.py > ...
174 def main_menu():
280 elif choice == "0":
281 print("Goodbye.")
282 break
283
284 else:
285 print("Invalid choice. Try again.")
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Enter choice: 2
Vehicle HR26 FG0001 registered successfully.
Vehicle HR26 FG0001 registered successfully.
Assignment: Cryptography & Blockchain Fundamentals
Assignment: Cryptography & Blockchain Fundamentals
Choose action: message
2) Sign a message (generate keys if needed)
3) Digital Signature: Generate keys (uses generated private key)
4) Digital Signature: Verify message (uses generated public key or generated one)
5) Digital Signature: Register a signature (supply public key or use generated one)
6) Vehicle Registry: Register vehicle by plate
7) Vehicle Registry: Delete vehicle by plate
8) Export current RSA keys to PEM (show on screen)
9) Exit
Enter choice: 2
Assignment: Cryptography & Blockchain Fundamentals
Assignment: Cryptography & Blockchain Fundamentals
Choose action: message
2) Sign a message (generate keys if needed)
powersh...
Python
Python
Python
Python
Python
Python
Python
> OUTLINE
> TIMELINE
Ln 290, Col 1 Spaces: 4 UTF-8 CRLF { } Python 3.13.7
10:01 PM
11/19/2025
DELL
Esc F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12 PrtScr Insert Delete

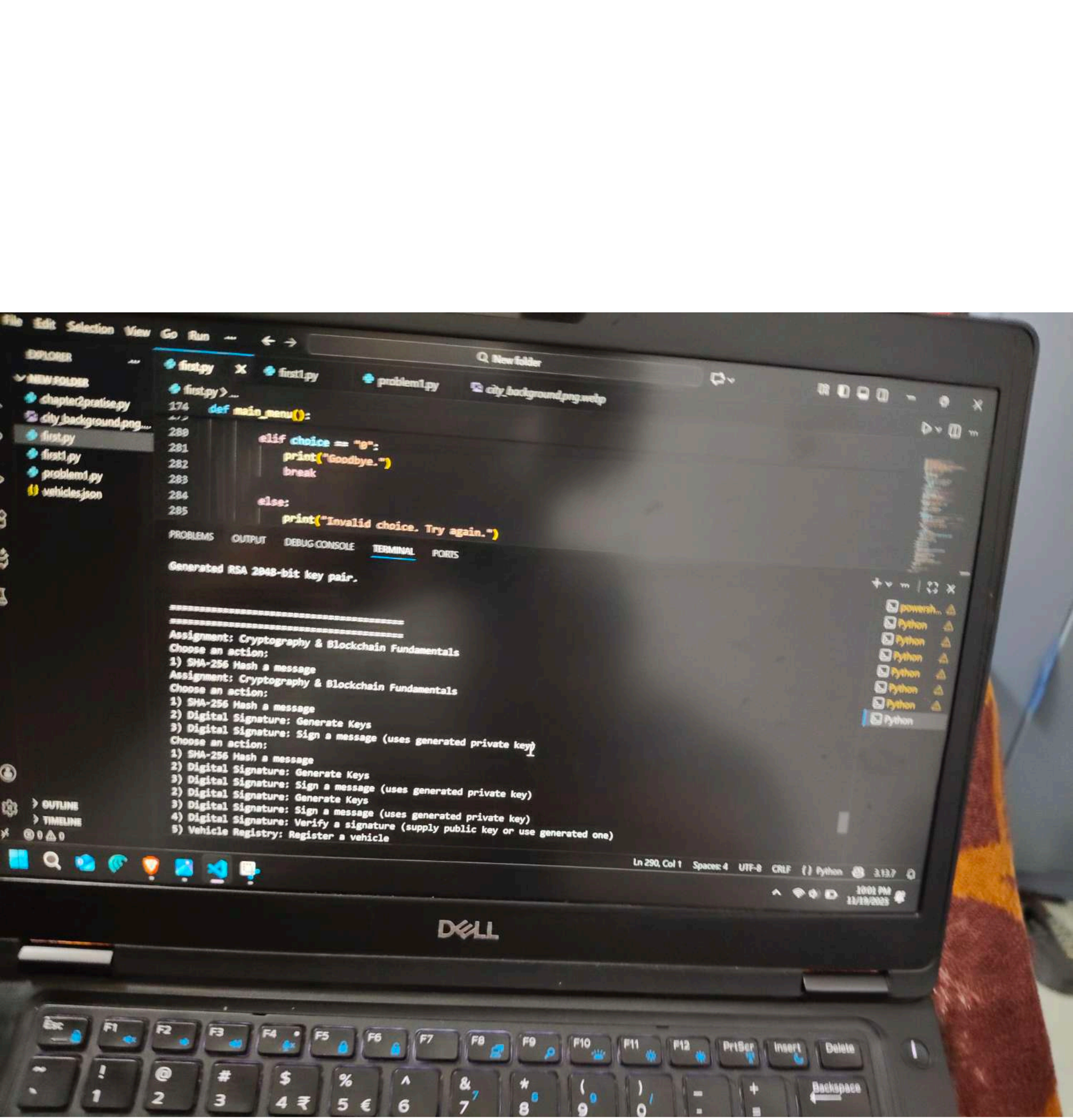
```
def main_menu():
        elif choice == "0":
            print("Goodbye.")
            break

        else:
            print("Invalid choice. Try again.")
```

```
1) SHA-256 Hash a message
2) Digital Signature: Generate Keys
3) Digital Signature: Sign a message (uses generated private key)
4) Digital Signature: Verify a signature (supply public key or use generated one)
5) Vehicle Registry: Register a vehicle
6) Vehicle Registry: Retrieve vehicle by plate
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice: 5

--- Register Vehicle ---
Enter Number Plate (e.g. ABC-1234): HR26 FG0001
Owner Name: HUNNY
Vehicle Model: THAR
Vehicle HR26 FG0001 registered successfully.

========================================
Assignment: Cryptography & Blockchain Fundamentals
Choose an action:
1) SHA-256 Hash a message
2) Digital Signature: Generate Keys
```

```
def main_menu():
        elif choice == "0":
            print("Goodbye.")
            break

        else:
            print("Invalid choice. Try again.")
```

```
Assignment: Cryptography & Blockchain Fundamentals
Choose an action:
1) SHA-256 Hash a message
2) Digital Signature: Generate Keys
3) Digital Signature: Sign a message (uses generated private key)
4) Digital Signature: Verify a signature (supply public key or use generated one)
5) Vehicle Registry: Register a vehicle
6) Vehicle Registry: Retrieve vehicle by plate
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice: 1
Enter text to hash: aman
SHA-256: 180d803a580fabe1a24ddfdf6bf51ecbea0eb81f256b69ee6b39b33d294f6ebf

========================================
Assignment: Cryptography & Blockchain Fundamentals
Choose an action:
1) SHA-256 Hash a message
2) Digital Signature: Generate Keys
3) Digital Signature: Sign a message (uses generated private key)
4) Digital Signature: Verify a signature (supply public key or use generated one)
```


File Edit Selection View Go Run
New folder
EXPLORER
NEW FOLDER
chapter2pratise.py
city_background.png....
first.py
first1.py
problem1.py
vehicles.json
first.py
first1.py
problem1.py
city_background.png.webp
174 def main_menu():
280 elif choice == "0":
281 print("Goodbye.")
282 break
283
284 else:
285 print("Invalid choice. Try again.")
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
6) Vehicle Registry: Retrieve vehicle by plate
7) Export current RSA keys to PEM (show on screen)
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice: & C:/Users/Home/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/Home/Desktop/New folder/first.py
"
Invalid choice. Try again.
==========
Assignment: Cryptography & Blockchain Fundamentals
Choose an action:
1) SHA-256 Hash a message
2) Digital Signature: Generate Keys
3) Digital Signature: Sign a message (uses generated private key)
4) Digital Signature: Verify a signature (supply public key or use generated one)
5) Vehicle Registry: Register a vehicle
6) Vehicle Registry: Retrieve vehicle by plate
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice:
powersh...
Python
OUTLINE
TIMELINE
Ln 290, Col 1 Spaces: 4 UTF-8 CRLF {} Python 3.13.7
10:01 PM
11/19/2025
DELL
Esc F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12 PrtScr Insert Delete
Backspace


File Edit Selection View Go Run ...
New folder
EXPLORER
NEW FOLDER
chapter2pratise.py
city_background.png....
first.py
first1.py
problem1.py
vehicles.json
first.py
first1.py
problem1.py
city_background.png.webp
first.py > ...
174 def main_menu():
280
281 elif choice == "8":
282 print("Goodbye.")
283 break
284
285 else:
print("Invalid choice. Try again.")
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
Generated RSA 2048-bit key pair.
Assignment: Cryptography & Blockchain Fundamentals
Choose an action:
1) SHA-256 Hash a message
Assignment: Cryptography & Blockchain Fundamentals
Choose an action:
1) SHA-256 Hash a message
2) Digital Signature: Generate Keys
3) Digital Signature: Sign a message (uses generated private key)
Choose an action:
1) SHA-256 Hash a message
2) Digital Signature: Generate Keys
3) Digital Signature: Sign a message (uses generated private key)
2) Digital Signature: Generate Keys
3) Digital Signature: Sign a message (uses generated private key)
4) Digital Signature: Verify a signature (supply public key or use generated one)
5) Vehicle Registry: Register a vehicle
OUTLINE
TIMELINE
Ln 290, Col 1
Spaces: 4
UTF-8
CRLF
Python
DELL

```
def main_menu():
        elif choice == "0":
            print("Goodbye.")
            break

        else:
            print("Invalid choice. Try again.")
```

```
0) Exit
Enter choice: 2
5) Vehicle Registry: Register a vehicle
6) Vehicle Registry: Retrieve vehicle by plate
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice: 2
6) Vehicle Registry: Retrieve vehicle by plate
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice: 2
Key size in bits [2048]: 2048
Generated RSA 2048-bit key pair.
Enter choice: 2
Key size in bits [2048]: 2048
Generated RSA 2048-bit key pair.
Key size in bits [2048]: 2048
Generated RSA 2048-bit key pair.
```

```
def main_menu():
        elif choice == "0":
            print("Goodbye.")
            break

        else:
            print("Invalid choice. Try again.")
```

```
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice: 2
4) Digital Signature: Verify a signature (supply public key or use generated one)
5) Vehicle Registry: Register a vehicle
6) Vehicle Registry: Retrieve vehicle by plate
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice: 2
5) Vehicle Registry: Register a vehicle
6) Vehicle Registry: Retrieve vehicle by plate
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice: 2
6) Vehicle Registry: Retrieve vehicle by plate
7) Export current RSA keys to PEM (show on screen)
0) Exit
Enter choice: 2
Key size in bits [2048]: 2048
Generated RSA 2048-bit key pair.
Enter choice: 2
```