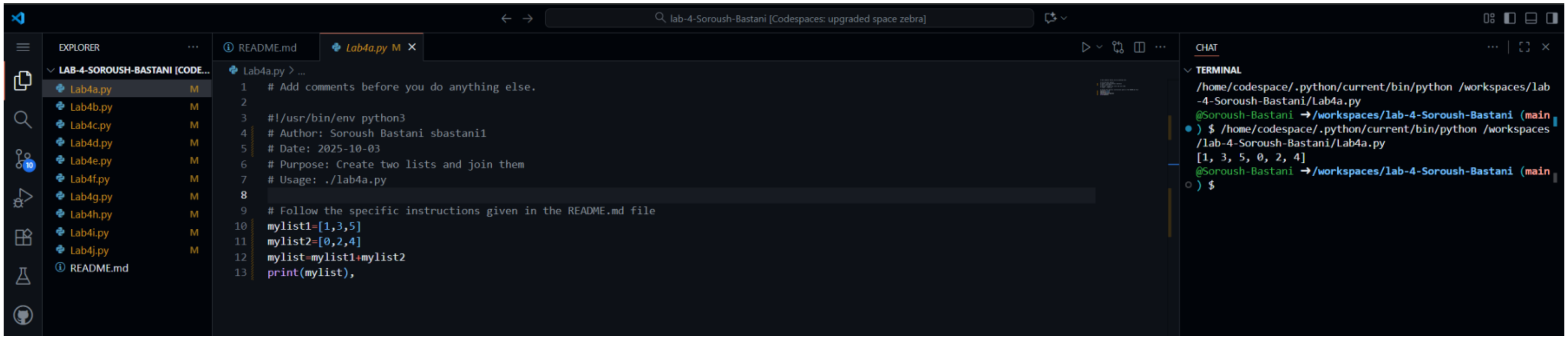
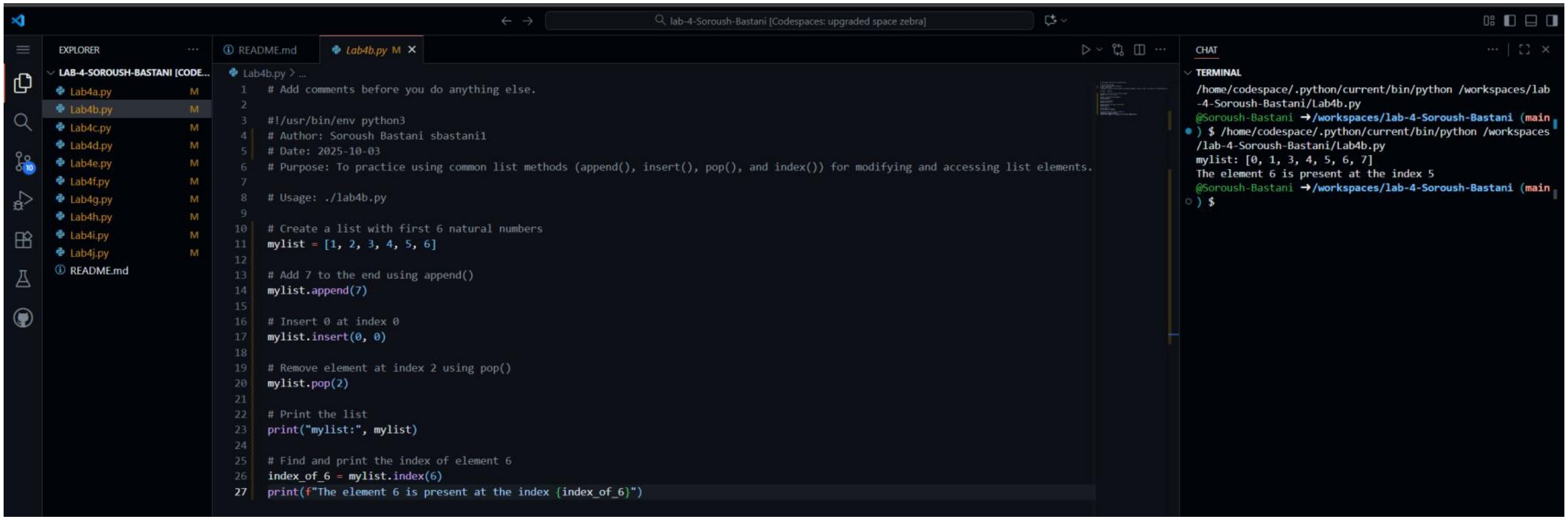
Lab4a



```python
# Add comments before you do anything else.

#!/usr/bin/env python3
# Author: Soroush Bastani sbastani1
# Date: 2025-10-03
# Purpose: Create two lists and join them
# Usage: ./lab4a.py

# Follow the specific instructions given in the README.md file
mylist1=[1,3,5]
mylist2=[0,2,4]
mylist=mylist1+mylist2
print(mylist),
```

```
/home/codespace/.python/current/bin/python /workspaces/lab
-4-Soroush-Bastani/Lab4a.py
@Soroush-Bastani ➜/workspaces/lab-4-Soroush-Bastani (main
● ) $ /home/codespace/.python/current/bin/python /workspaces
/lab-4-Soroush-Bastani/Lab4a.py
[1, 3, 5, 0, 2, 4]
@Soroush-Bastani ➜/workspaces/lab-4-Soroush-Bastani (main
○ ) $
```

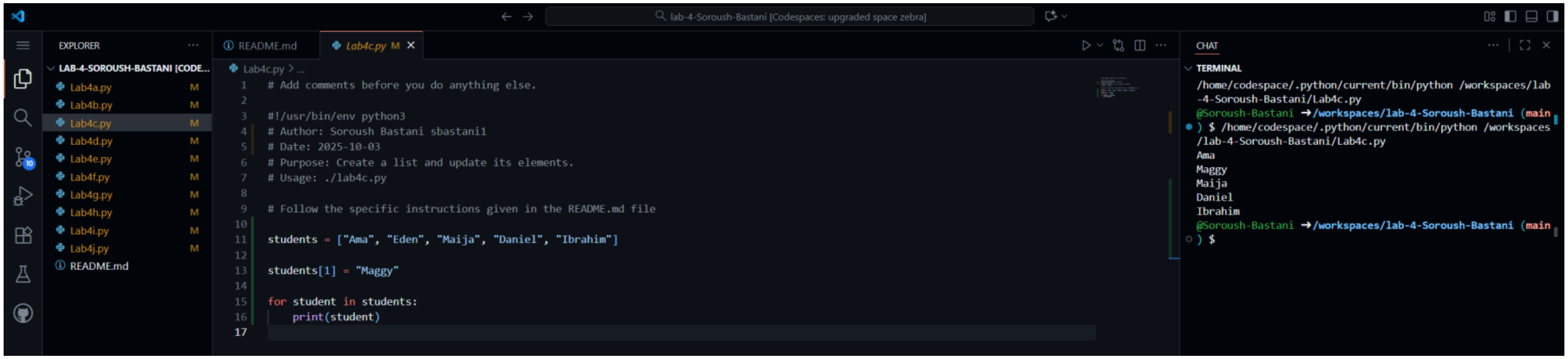
Lab4b



```python
# Add comments before you do anything else.

#!/usr/bin/env python3
# Author: Soroush Bastani sbastani1
# Date: 2025-10-03
# Purpose: To practice using common list methods (append(), insert(), pop(), and index()) for modifying and accessing list elements.

# Usage: ./lab4b.py

# Create a list with first 6 natural numbers
mylist = [1, 2, 3, 4, 5, 6]

# Add 7 to the end using append()
mylist.append(7)

# Insert 0 at index 0
mylist.insert(0, 0)

# Remove element at index 2 using pop()
mylist.pop(2)

# Print the list
print("mylist:", mylist)

# Find and print the index of element 6
index_of_6 = mylist.index(6)
print(f"The element 6 is present at the index {index_of_6}")
```

```
/home/codespace/.python/current/bin/python /workspaces/lab
-4-Soroush-Bastani/Lab4b.py
@Soroush-Bastani ➜/workspaces/lab-4-Soroush-Bastani (main
● ) $ /home/codespace/.python/current/bin/python /workspaces
/lab-4-Soroush-Bastani/Lab4b.py
mylist: [0, 1, 3, 4, 5, 6, 7]
The element 6 is present at the index 5
@Soroush-Bastani ➜/workspaces/lab-4-Soroush-Bastani (main
○ ) $
```

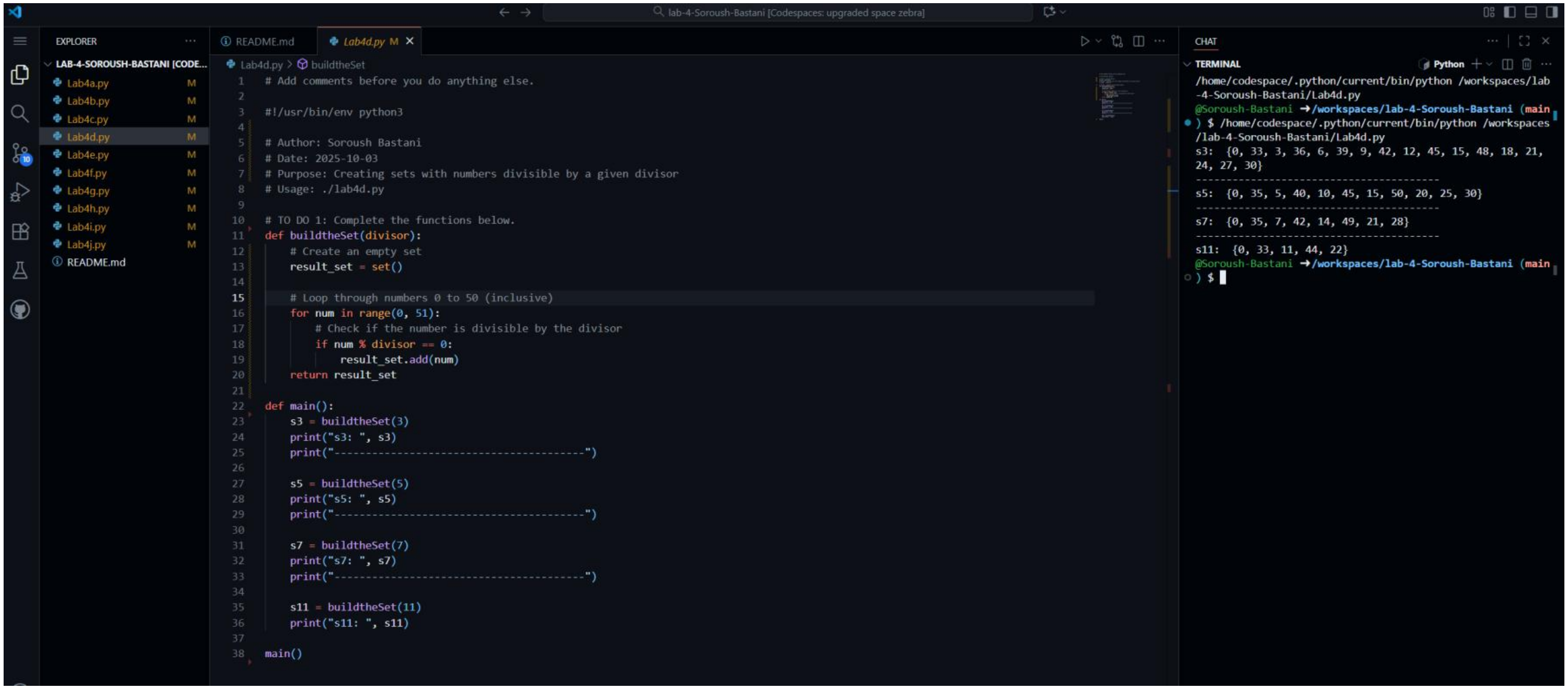
Lab4c



```python
# Add comments before you do anything else.

#!/usr/bin/env python3
# Author: Soroush Bastani sbastani1
# Date: 2025-10-03
# Purpose: Create a list and update its elements.
# Usage: ./lab4c.py

# Follow the specific instructions given in the README.md file

students = ["Ama", "Eden", "Maija", "Daniel", "Ibrahim"]

students[1] = "Maggy"

for student in students:
    print(student)

```

```
/home/codespace/.python/current/bin/python /workspaces/lab
-4-Soroush-Bastani/Lab4c.py
@Soroush-Bastani ➜ /workspaces/lab-4-Soroush-Bastani (main
) $ /home/codespace/.python/current/bin/python /workspaces
/lab-4-Soroush-Bastani/Lab4c.py
Ama
Maggy
Maija
Daniel
Ibrahim
@Soroush-Bastani ➜ /workspaces/lab-4-Soroush-Bastani (main
) $
```

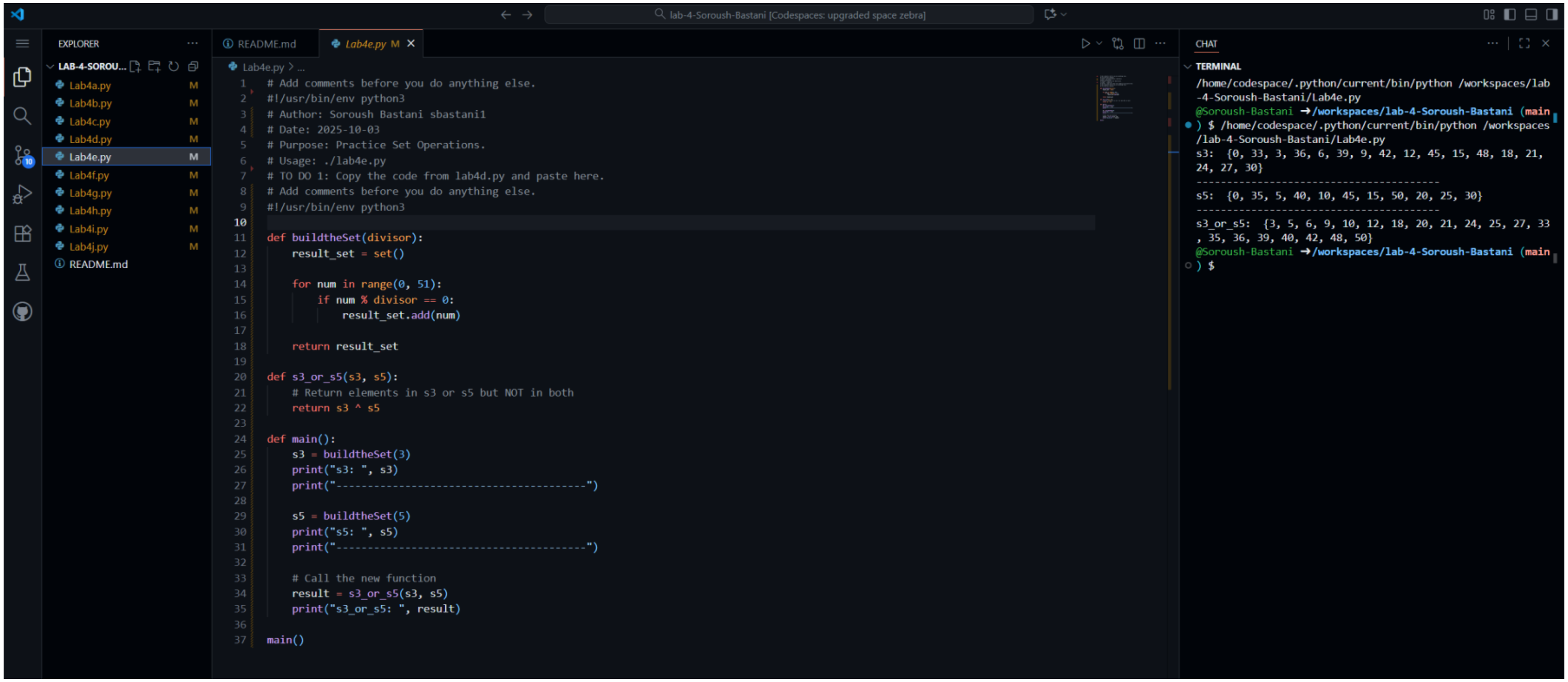
Lab4d



```python
# Add comments before you do anything else.

#!/usr/bin/env python3

# Author: Soroush Bastani
# Date: 2025-10-03
# Purpose: Creating sets with numbers divisible by a given divisor
# Usage: ./lab4d.py

# TO DO 1: Complete the functions below.
def buildtheSet(divisor):
    # Create an empty set
    result_set = set()

    # Loop through numbers 0 to 50 (inclusive)
    for num in range(0, 51):
        # Check if the number is divisible by the divisor
        if num % divisor == 0:
            result_set.add(num)
    return result_set

def main():
    s3 = buildtheSet(3)
    print("s3: ", s3)
    print("----------------------------------------")

    s5 = buildtheSet(5)
    print("s5: ", s5)
    print("----------------------------------------")

    s7 = buildtheSet(7)
    print("s7: ", s7)
    print("----------------------------------------")

    s11 = buildtheSet(11)
    print("s11: ", s11)

main()
```

```
/home/codespace/.python/current/bin/python /workspaces/lab
-4-Soroush-Bastani/Lab4d.py
@Soroush-Bastani ➜/workspaces/lab-4-Soroush-Bastani (main
) $ /home/codespace/.python/current/bin/python /workspaces
/lab-4-Soroush-Bastani/Lab4d.py
s3:  {0, 33, 3, 36, 6, 39, 9, 42, 12, 45, 15, 48, 18, 21,
24, 27, 30}
----------------------------------------
s5:  {0, 35, 5, 40, 10, 45, 15, 50, 20, 25, 30}
----------------------------------------
s7:  {0, 35, 7, 42, 14, 49, 21, 28}
----------------------------------------
s11:  {0, 33, 11, 44, 22}
@Soroush-Bastani ➜/workspaces/lab-4-Soroush-Bastani (main
) $ 
```

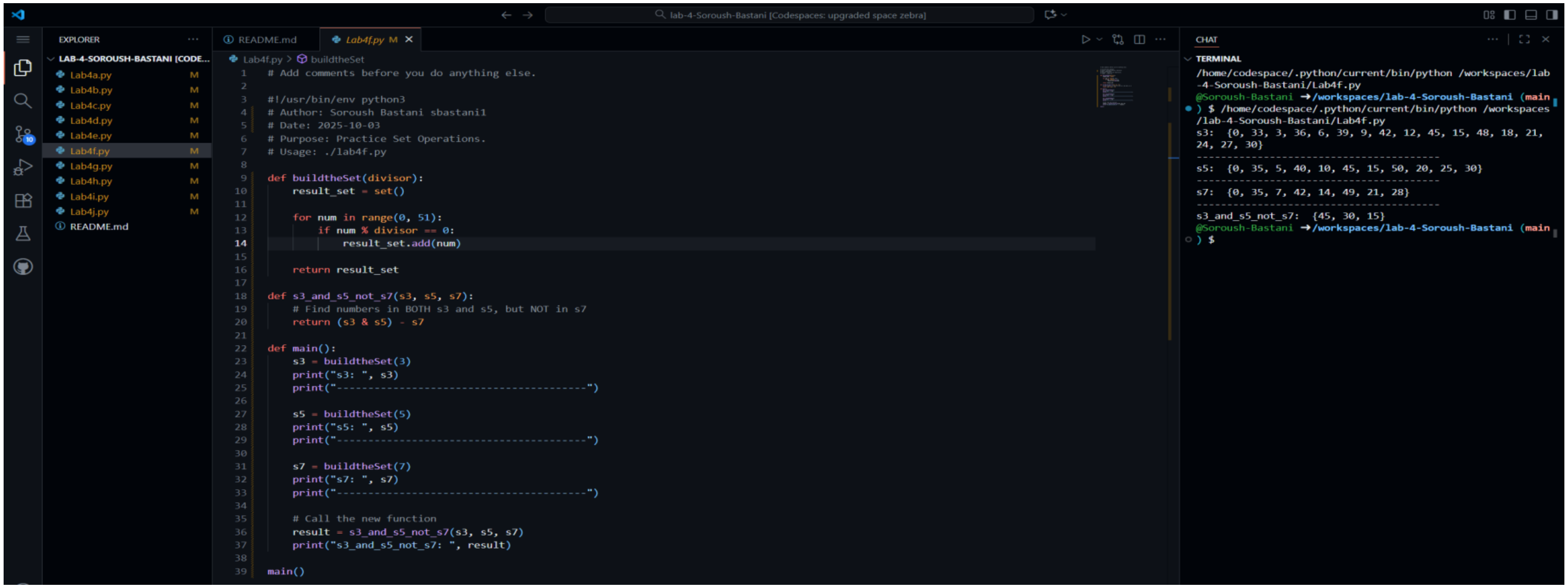
Lab4e



```python
# Add comments before you do anything else.
#!/usr/bin/env python3
# Author: Soroush Bastani sbastani1
# Date: 2025-10-03
# Purpose: Practice Set Operations.
# Usage: ./lab4e.py
# TO DO 1: Copy the code from lab4d.py and paste here.
# Add comments before you do anything else.
#!/usr/bin/env python3

def buildtheSet(divisor):
    result_set = set()

    for num in range(0, 51):
        if num % divisor == 0:
            result_set.add(num)

    return result_set

def s3_or_s5(s3, s5):
    # Return elements in s3 or s5 but NOT in both
    return s3 ^ s5

def main():
    s3 = buildtheSet(3)
    print("s3: ", s3)
    print("----------------------------------------")

    s5 = buildtheSet(5)
    print("s5: ", s5)
    print("----------------------------------------")

    # Call the new function
    result = s3_or_s5(s3, s5)
    print("s3_or_s5: ", result)

main()
```

```
/home/codespace/.python/current/bin/python /workspaces/lab
-4-Soroush-Bastani/Lab4e.py
@Soroush-Bastani ➜ /workspaces/lab-4-Soroush-Bastani (main
) $ /home/codespace/.python/current/bin/python /workspaces
/lab-4-Soroush-Bastani/Lab4e.py
s3:  {0, 33, 3, 36, 6, 39, 9, 42, 12, 45, 15, 48, 18, 21,
24, 27, 30}
----------------------------------------
s5:  {0, 35, 5, 40, 10, 45, 15, 50, 20, 25, 30}
----------------------------------------
s3_or_s5:  {3, 5, 6, 9, 10, 12, 18, 20, 21, 24, 25, 27, 33
, 35, 36, 39, 40, 42, 48, 50}
@Soroush-Bastani ➜ /workspaces/lab-4-Soroush-Bastani (main
) $
```

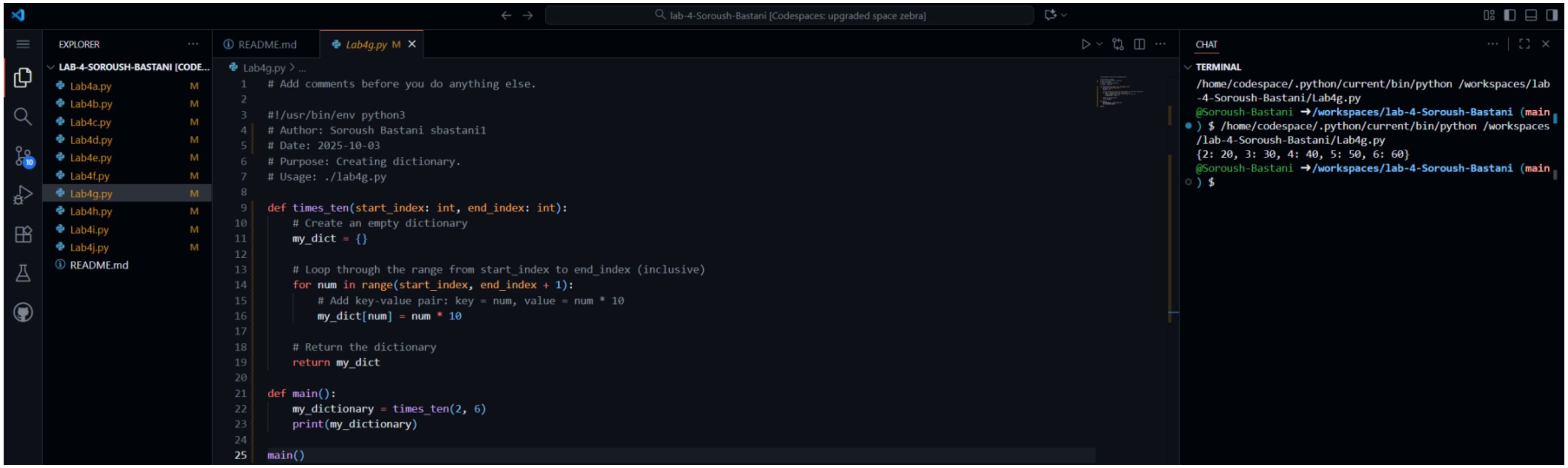
Lab4f



```python
# Add comments before you do anything else.

#!/usr/bin/env python3
# Author: Soroush Bastani sbastani1
# Date: 2025-10-03
# Purpose: Practice Set Operations.
# Usage: ./lab4f.py

def buildtheSet(divisor):
    result_set = set()

    for num in range(0, 51):
        if num % divisor == 0:
            result_set.add(num)

    return result_set

def s3_and_s5_not_s7(s3, s5, s7):
    # Find numbers in BOTH s3 and s5, but NOT in s7
    return (s3 & s5) - s7

def main():
    s3 = buildtheSet(3)
    print("s3: ", s3)
    print("--------------------------------------")

    s5 = buildtheSet(5)
    print("s5: ", s5)
    print("--------------------------------------")

    s7 = buildtheSet(7)
    print("s7: ", s7)
    print("--------------------------------------")

    # Call the new function
    result = s3_and_s5_not_s7(s3, s5, s7)
    print("s3_and_s5_not_s7: ", result)

main()
```

```
/home/codespace/.python/current/bin/python /workspaces/lab
-4-Soroush-Bastani/Lab4f.py
@Soroush-Bastani ➜/workspaces/lab-4-Soroush-Bastani (main
) $ /home/codespace/.python/current/bin/python /workspaces
/lab-4-Soroush-Bastani/Lab4f.py
s3:  {0, 33, 3, 36, 6, 39, 9, 42, 12, 45, 15, 48, 18, 21,
24, 27, 30}
--------------------------------------
s5:  {0, 35, 5, 40, 10, 45, 15, 50, 20, 25, 30}
--------------------------------------
s7:  {0, 35, 7, 42, 14, 49, 21, 28}
--------------------------------------
s3_and_s5_not_s7:  {45, 30, 15}
@Soroush-Bastani ➜/workspaces/lab-4-Soroush-Bastani (main
) $
```

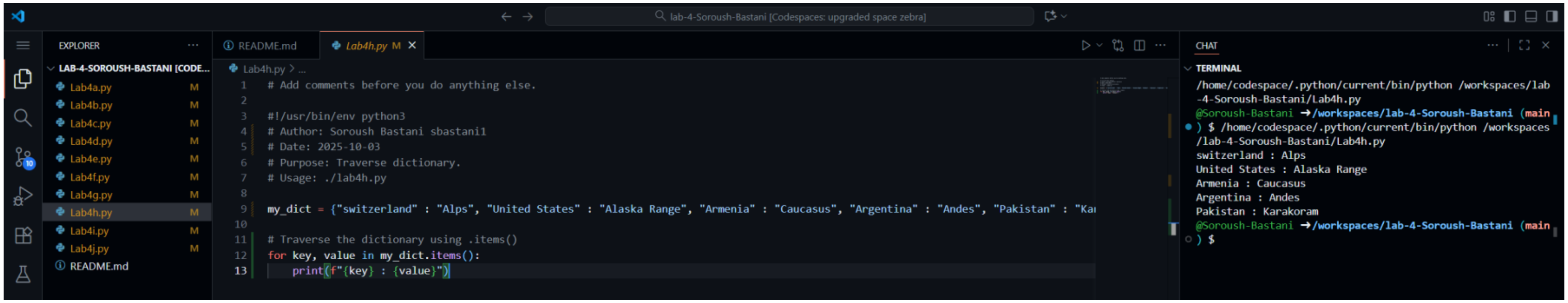
Lab4g



```python
# Add comments before you do anything else.

#!/usr/bin/env python3
# Author: Soroush Bastani sbastani1
# Date: 2025-10-03
# Purpose: Creating dictionary.
# Usage: ./lab4g.py

def times_ten(start_index: int, end_index: int):
    # Create an empty dictionary
    my_dict = {}

    # Loop through the range from start_index to end_index (inclusive)
    for num in range(start_index, end_index + 1):
        # Add key-value pair: key = num, value = num * 10
        my_dict[num] = num * 10

    # Return the dictionary
    return my_dict

def main():
    my_dictionary = times_ten(2, 6)
    print(my_dictionary)

main()
```

```
/home/codespace/.python/current/bin/python /workspaces/lab
-4-Soroush-Bastani/Lab4g.py
@Soroush-Bastani ➜/workspaces/lab-4-Soroush-Bastani (main
) $ /home/codespace/.python/current/bin/python /workspaces
/lab-4-Soroush-Bastani/Lab4g.py
{2: 20, 3: 30, 4: 40, 5: 50, 6: 60}
@Soroush-Bastani ➜/workspaces/lab-4-Soroush-Bastani (main
) $
```

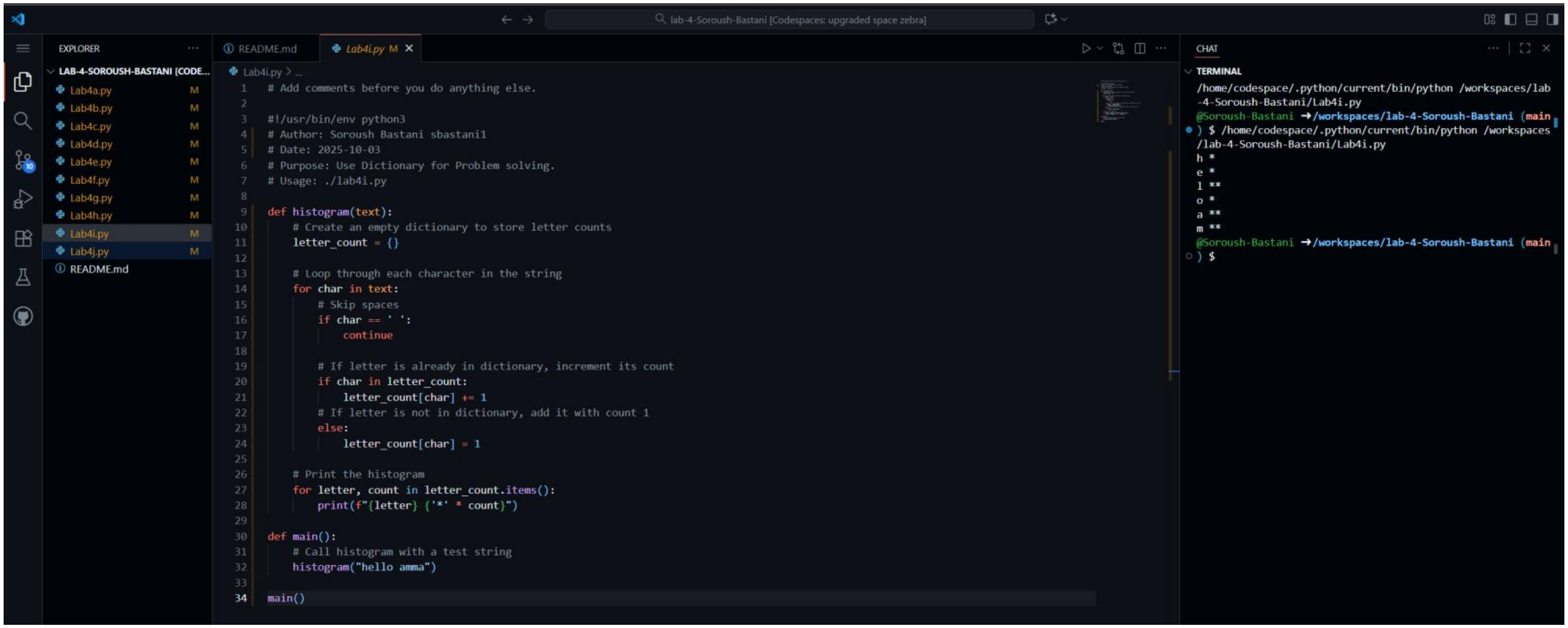
Lab4h



```python
# Add comments before you do anything else.

#!/usr/bin/env python3
# Author: Soroush Bastani sbastani1
# Date: 2025-10-03
# Purpose: Traverse dictionary.
# Usage: ./lab4h.py

my_dict = {"switzerland" : "Alps", "United States" : "Alaska Range", "Armenia" : "Caucasus", "Argentina" : "Andes", "Pakistan" : "Ka

# Traverse the dictionary using .items()
for key, value in my_dict.items():
    print(f"{key} : {value}")
```

```
/home/codespace/.python/current/bin/python /workspaces/lab
-4-Soroush-Bastani/Lab4h.py
@Soroush-Bastani ➜/workspaces/lab-4-Soroush-Bastani (main
) $ /home/codespace/.python/current/bin/python /workspaces
/lab-4-Soroush-Bastani/Lab4h.py
switzerland : Alps
United States : Alaska Range
Armenia : Caucasus
Argentina : Andes
Pakistan : Karakoram
@Soroush-Bastani ➜/workspaces/lab-4-Soroush-Bastani (main
) $
```

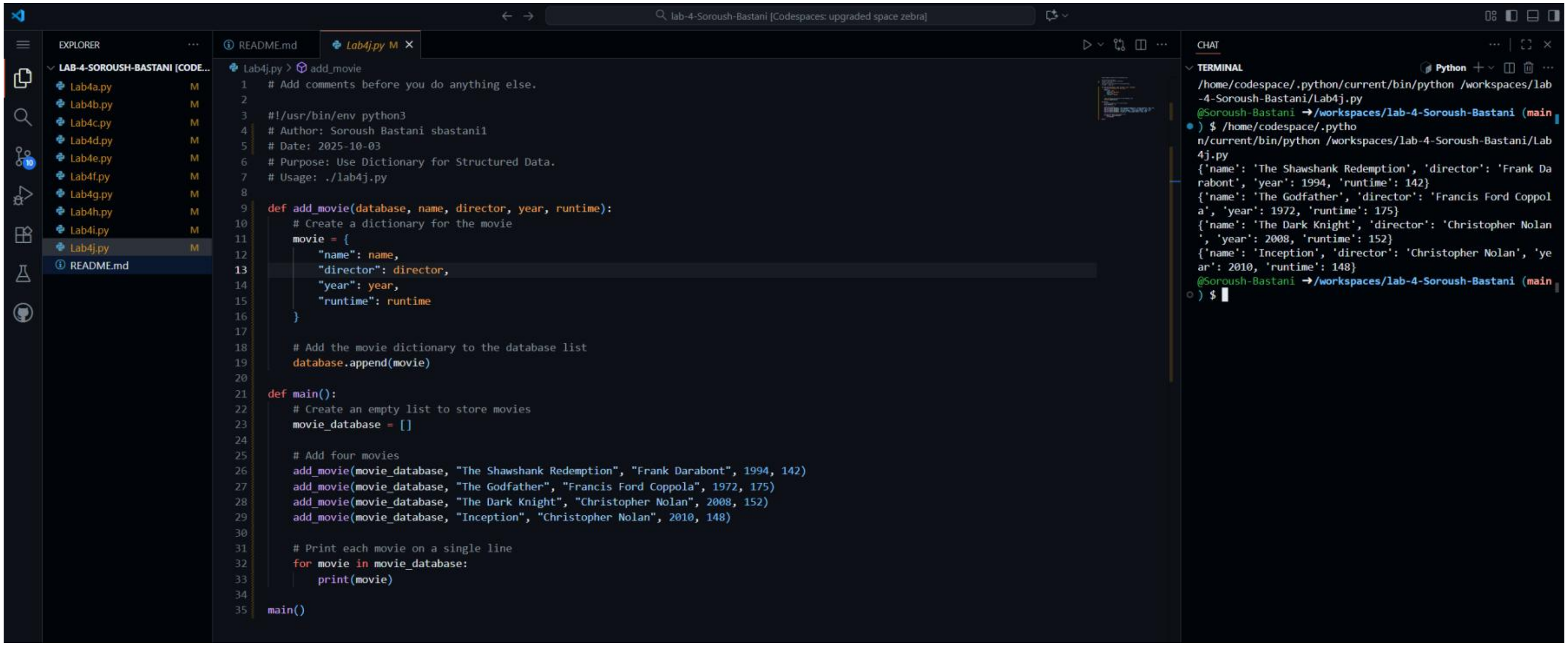
Lab4i



```python
# Add comments before you do anything else.

#!/usr/bin/env python3
# Author: Soroush Bastani sbastani1
# Date: 2025-10-03
# Purpose: Use Dictionary for Problem solving.
# Usage: ./lab4i.py

def histogram(text):
    # Create an empty dictionary to store letter counts
    letter_count = {}

    # Loop through each character in the string
    for char in text:
        # Skip spaces
        if char == ' ':
            continue

        # If letter is already in dictionary, increment its count
        if char in letter_count:
            letter_count[char] += 1
        # If letter is not in dictionary, add it with count 1
        else:
            letter_count[char] = 1

    # Print the histogram
    for letter, count in letter_count.items():
        print(f"{letter} {'*' * count}")

def main():
    # Call histogram with a test string
    histogram("hello amma")

main()
```

```
/home/codespace/.python/current/bin/python /workspaces/lab
-4-Soroush-Bastani/Lab4i.py
@Soroush-Bastani ➜/workspaces/lab-4-Soroush-Bastani (main
) $ /home/codespace/.python/current/bin/python /workspaces
/lab-4-Soroush-Bastani/Lab4i.py
h *
e *
l **
o *
a **
m **
@Soroush-Bastani ➜/workspaces/lab-4-Soroush-Bastani (main
) $
```

Lab4j



```python
# Add comments before you do anything else.

#!/usr/bin/env python3
# Author: Soroush Bastani sbastani1
# Date: 2025-10-03
# Purpose: Use Dictionary for Structured Data.
# Usage: ./lab4j.py

def add_movie(database, name, director, year, runtime):
    # Create a dictionary for the movie
    movie = {
        "name": name,
        "director": director,
        "year": year,
        "runtime": runtime
    }

    # Add the movie dictionary to the database list
    database.append(movie)

def main():
    # Create an empty list to store movies
    movie_database = []

    # Add four movies
    add_movie(movie_database, "The Shawshank Redemption", "Frank Darabont", 1994, 142)
    add_movie(movie_database, "The Godfather", "Francis Ford Coppola", 1972, 175)
    add_movie(movie_database, "The Dark Knight", "Christopher Nolan", 2008, 152)
    add_movie(movie_database, "Inception", "Christopher Nolan", 2010, 148)

    # Print each movie on a single line
    for movie in movie_database:
        print(movie)

main()
```

```
/home/codespace/.python/current/bin/python /workspaces/lab
-4-Soroush-Bastani/Lab4j.py
@Soroush-Bastani ➜ /workspaces/lab-4-Soroush-Bastani (main
) $ /home/codespace/.pytho
n/current/bin/python /workspaces/lab-4-Soroush-Bastani/Lab
4j.py
{'name': 'The Shawshank Redemption', 'director': 'Frank Da
rabont', 'year': 1994, 'runtime': 142}
{'name': 'The Godfather', 'director': 'Francis Ford Coppol
a', 'year': 1972, 'runtime': 175}
{'name': 'The Dark Knight', 'director': 'Christopher Nolan
', 'year': 2008, 'runtime': 152}
{'name': 'Inception', 'director': 'Christopher Nolan', 'ye
ar': 2010, 'runtime': 148}
@Soroush-Bastani ➜ /workspaces/lab-4-Soroush-Bastani (main
) $
```