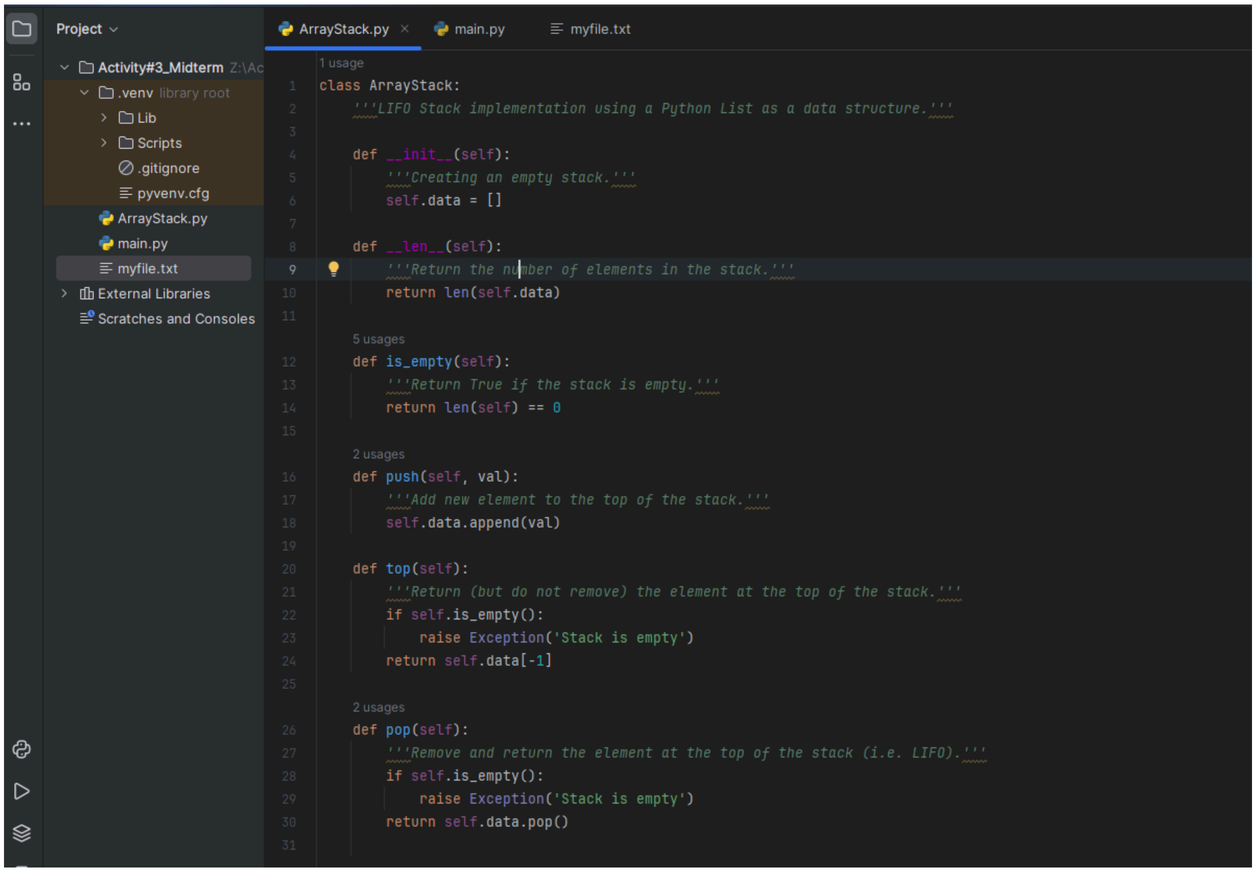
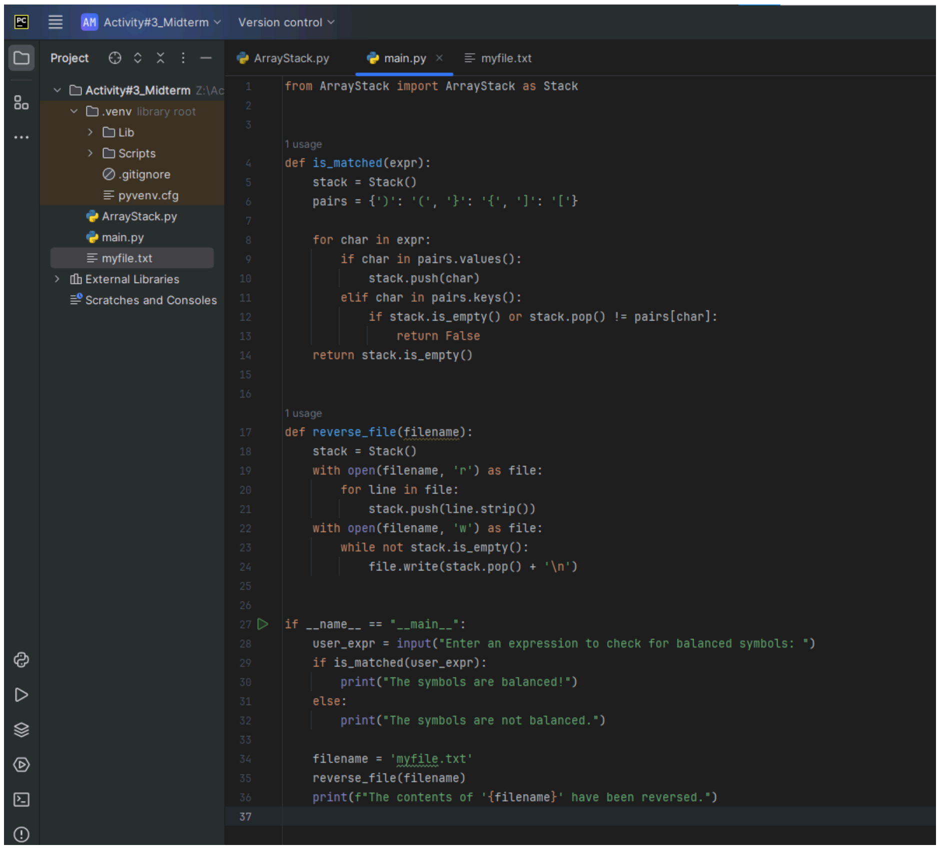
## ARRAY STACK



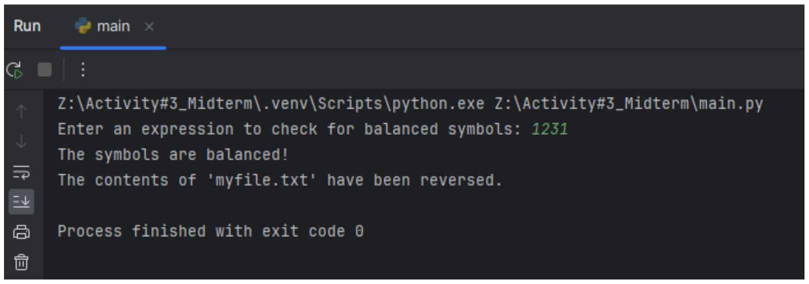
```python
class ArrayStack:
    '''LIFO Stack implementation using a Python List as a data structure.'''

    def __init__(self):
        '''Creating an empty stack.'''
        self.data = []

    def __len__(self):
        '''Return the number of elements in the stack.'''
        return len(self.data)

    def is_empty(self):
        '''Return True if the stack is empty.'''
        return len(self) == 0

    def push(self, val):
        '''Add new element to the top of the stack.'''
        self.data.append(val)

    def top(self):
        '''Return (but do not remove) the element at the top of the stack.'''
        if self.is_empty():
            raise Exception('Stack is empty')
        return self.data[-1]

    def pop(self):
        '''Remove and return the element at the top of the stack (i.e. LIFO).'''
        if self.is_empty():
            raise Exception('Stack is empty')
        return self.data.pop()

```

## MAIN.PY

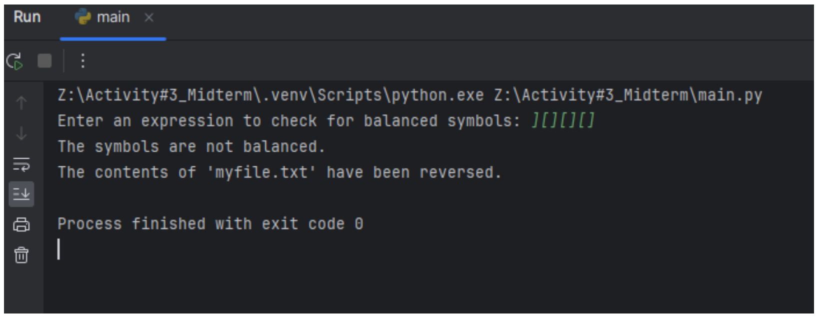


```python
from ArrayStack import ArrayStack as Stack


def is_matched(expr):
    stack = Stack()
    pairs = {')': '(', '}': '{', ']': '['}

    for char in expr:
        if char in pairs.values():
            stack.push(char)
        elif char in pairs.keys():
            if stack.is_empty() or stack.pop() != pairs[char]:
                return False
    return stack.is_empty()


def reverse_file(filename):
    stack = Stack()
    with open(filename, 'r') as file:
        for line in file:
            stack.push(line.strip())
    with open(filename, 'w') as file:
        while not stack.is_empty():
            file.write(stack.pop() + '\n')


if __name__ == "__main__":
    user_expr = input("Enter an expression to check for balanced symbols: ")
    if is_matched(user_expr):
        print("The symbols are balanced!")
    else:
        print("The symbols are not balanced.")

    filename = 'myfile.txt'
    reverse_file(filename)
    print(f"The contents of '{filename}' have been reversed.")
```

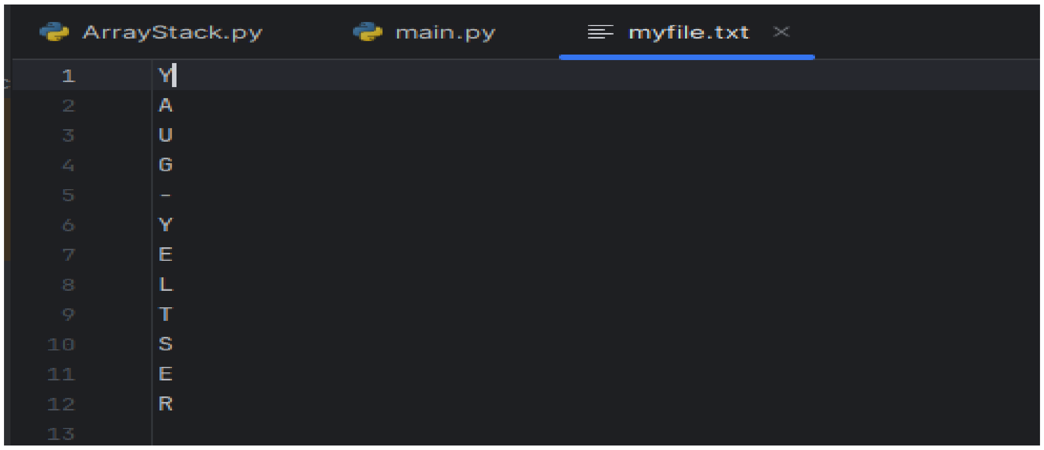
## OUTPUT:



```
Z:\Activity#3_Midterm\.venv\Scripts\python.exe Z:\Activity#3_Midterm\main.py
Enter an expression to check for balanced symbols: 1231
The symbols are balanced!
The contents of 'myfile.txt' have been reversed.

Process finished with exit code 0
```



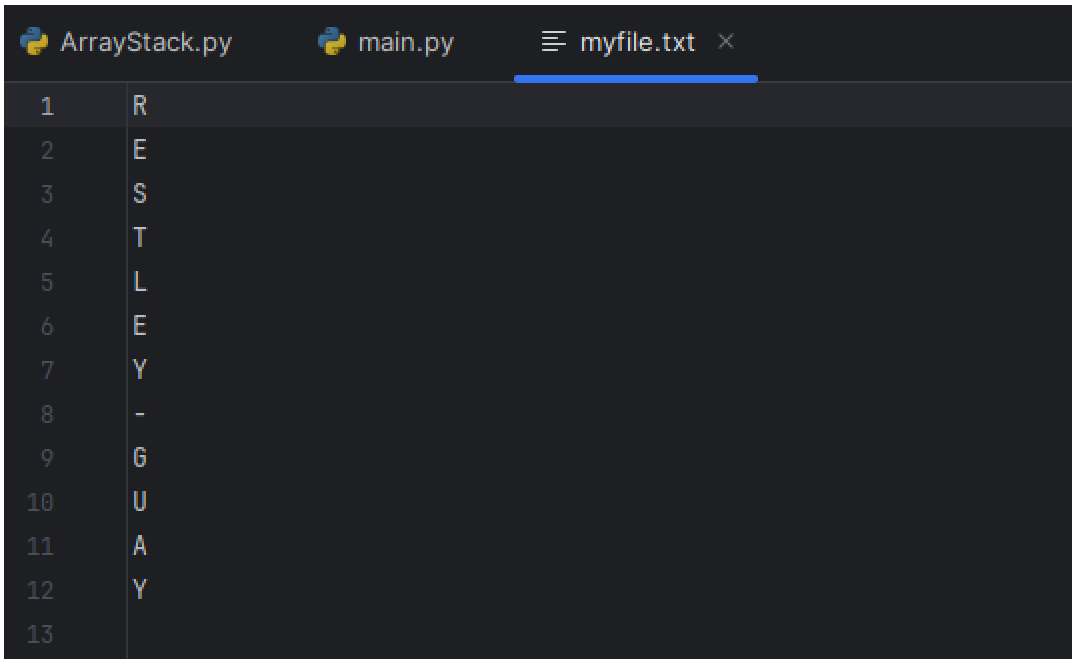
```
Z:\Activity#3_Midterm\.venv\Scripts\python.exe Z:\Activity#3_Midterm\main.py
Enter an expression to check for balanced symbols: ][][][]
The symbols are not balanced.
The contents of 'myfile.txt' have been reversed.

Process finished with exit code 0
```



ArrayStack.py main.py myfile.txt

```
Y
A
U
G
-
Y
E
L
T
S
E
R
```

MYFILE.TXT



ArrayStack.py main.py myfile.txt

```
R
E
S
T
L
E
Y
-
G
U
A
Y
```