DATA STRUCTURE AND ALGORITHM

LAB REPORT

Name	AREEBA FAROOQ
Registration Number	200901058
Batch & Section	BSCS 01 (SECTION A)
Instructor's Name	Sir Nadeem

DATE:23-10-2021

TASK 1

Write a program to let the user enter a string of his own choice. Check whether the given string is a palindrome or not using stack

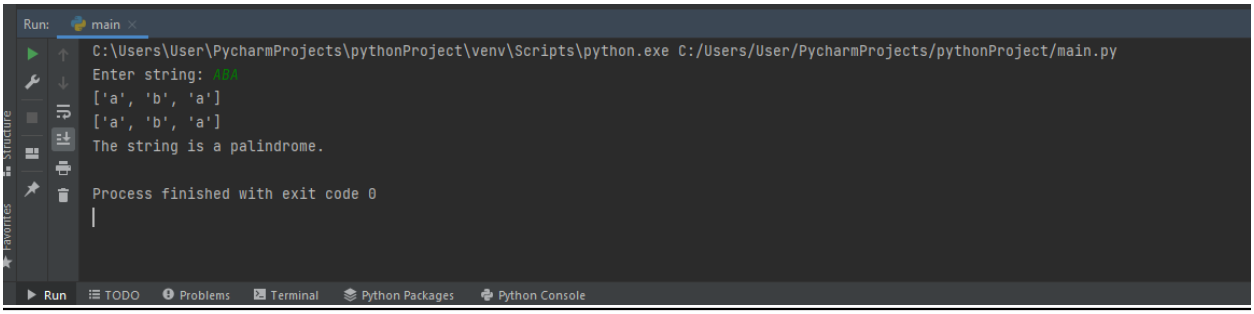
SOLUTION

```
string = input("Enter string: ")
string = string.lower()
stack = []

for letter in string:
  stack.append(letter)

print(stack)
reverse_stack = stack[::-1]
print(reverse_stack)

if stack == reverse_stack:
    print('The string is a palindrome.')
else:
    print('The string is not a palindrome.')
```

```python
string = input("Enter string: ")
string = string.lower()
stack = []

for letter in string:
    stack.append(letter)

print(stack)
reverse_stack = stack[::-1]
print(reverse_stack)

if stack == reverse_stack:
    print('The string is a palindrome.')
else:
    print('The string is not a palindrome.')
```

OUTPUT

```
C:\Users\User\PycharmProjects\pythonProject\venv\Scripts\python.exe C:/Users/User/PycharmProjects/pythonProject/main.py
Enter string: areeba
['a', 'r', 'e', 'e', 'b', 'a']
['a', 'b', 'e', 'e', 'r', 'a']
The string is not a palindrome.

Process finished with exit code 0
```



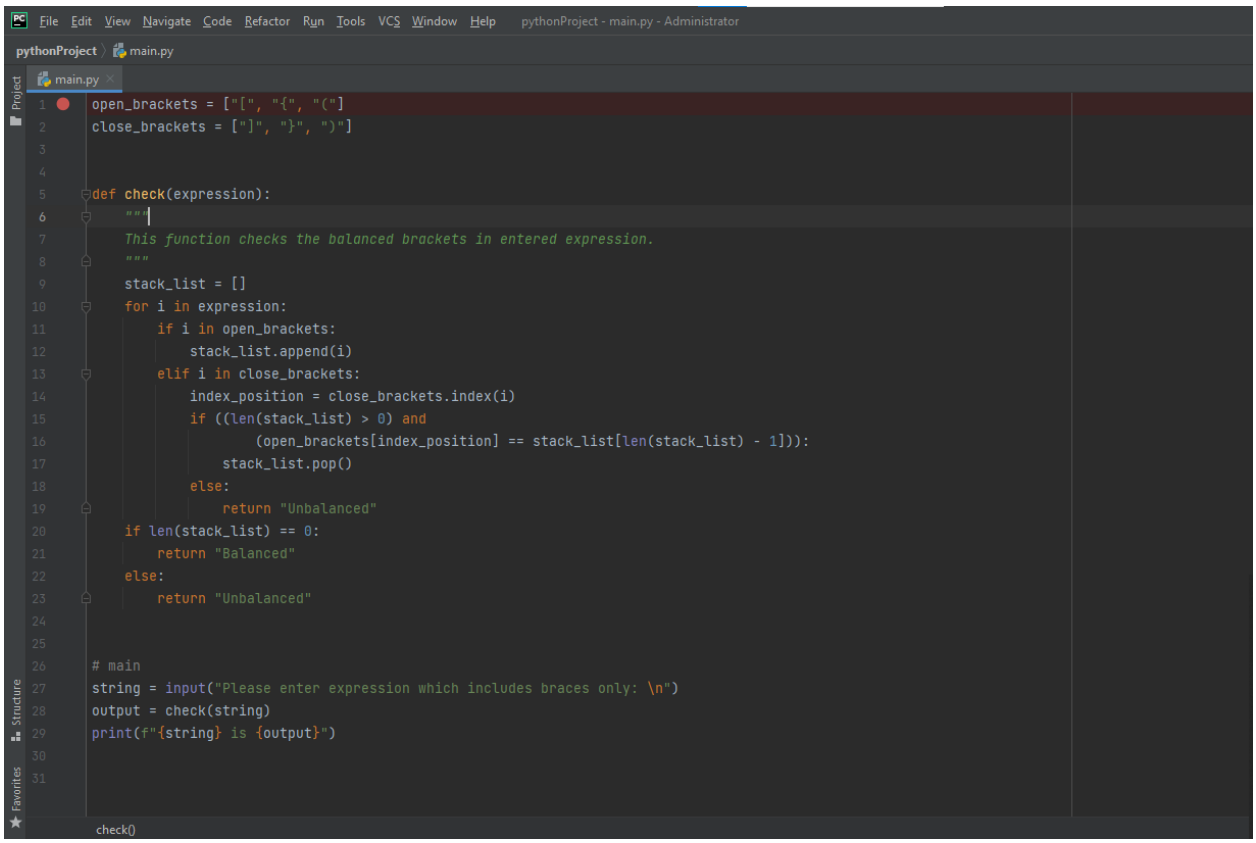
TASK 2

Write a program to check the balanced parenthesis in the expression or not using stack

SOLUTION

```
open_brackets = ["[", "{", "("]

close_brackets = ["]", "}", ")"]



def check(expression):
    """
    This function checks the balanced brackets in entered expression.
    """
    stack_list = []
    for i in expression:
        if i in open_brackets:
            stack_list.append(i)
        elif i in close_brackets:
            index_position = close_brackets.index(i)
            if ((len(stack_list) > 0) and
                    (open_brackets[index_position] == stack_list[len(stack_list) - 1])):
                stack_list.pop()
            else:
                return "Unbalanced"
    if len(stack_list) == 0:
```

```
        return "Balanced"
    else:
        return "Unbalanced"


# main
string = input("Please enter expression which includes braces only: \n")
output = check(string)
print(f"{string} is {output}")
```



OUTPUT

```
Run: main
C:\Users\User\PycharmProjects\pythonProject\venv\Scripts\python.exe C:/Users/User/PycharmProjects/pythonProject/main.py
Please enter expression which includes braces only:
{({})}]
{({})}] is Unbalanced

Process finished with exit code 0
```

```
Run: main
C:\Users\User\PycharmProjects\pythonProject\venv\Scripts\python.exe C:/Users/User/PycharmProjects/pythonProject/main.py
Please enter expression which includes braces only:

({})[]
 is Balanced

Process finished with exit code 0
```