SAVEETHA SCHOOL OF ENGINEERING

DEPARTMENT OF COMPUTERSCIENCE AND ENGINEERING

CSA0889 – Python Programming

Assignment – 4

1. Given an integer n, return the number of strings of length n that consist only of vowels (a, e, i, o, u) and are lexicographically sorted. A string s is lexicographically sorted if for all valid i, s[i] is the same as or comes before s[i+1] in the alphabet.

   Test Cases:

   1.Input: n = 1 Output: 5

   Explanation: The 5 sorted strings that consist of vowels only are ["a","e","i","o","u"].

   2.Input: n = 2 Output: 15

   Explanation: The 15 sorted strings that consist of vowels only are ["aa","ae","ai","ao","au","ee","ei","eo","eu","ii","io","iu","oo","ou", "uu"].

   Note that "ea" is not a valid string since 'e' comes after 'a' in the alphabet.

   3. Input: n = 33 Output: 66045

   4.n=-5 5.n=10

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```python
def countVowelStrings(n):
    return (n + 4) * (n + 3) * (n + 2) * (n + 1) // 24
n = int(input("Enter the length of the string: "))
result = countVowelStrings(n)
print("Number of strings of length", n, result)
```

IDLE Shell 3.11.4

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```
Python 3.11.4 (tags/v3.11.4:d2340ef, Jun  7 2023, 05:45:37) [MSC v.1934 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

= RESTART: C:/Users/ganes/AppData/Local/Programs/Python/Python311/countvowels.py
Enter the length of the string: 2
Number of strings of length 2 15
```

Ln: 7 Col: 0

2. Given two binary strings a and b, return their sum as a binary string.

- a and b consist only of '0' or '1' characters.
- Each string does not contain leading zeros except for the zero itself.

Test cases:

1.Input: a = "11", b = "1" Output: "100"

2.Input: a = "1010", b = "1011" Output: "10101"

3.a= “1111”, b= “1010”

4.a= “101101”, b= “1100”

5.a= “1011” b= “1111”

```python
def addBinary(a, b):
    return bin(int(a, 2) + int(b, 2))[2:]
a = input("Enter the first binary string: ")
b = input("Enter the second binary string: ")
result = addBinary(a, b)
print("The sum of the binary strings is:", result)
```

```
IDLE Shell 3.11.4
Python 3.11.4 (tags/v3.11.4:d2340ef, Jun  7 2023, 05:45:37) [MSC v.1934 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>
= RESTART: C:/Users/ganes/AppData/Local/Programs/Python/Python311/addbinary.py
Enter the first binary string: 11
Enter the second binary string: 1
The sum of the binary strings is: 100
>>
Ln: 8  Col: 0
```

3. Basic Calculator II Given a string s which represents an expression, evaluate this expression and return its value. The integer division should truncate toward zero. You may assume that the given expression is always valid. All intermediate results will be in the range of [-231, 231 - 1].

• s consists of integers and operators ('+', '-', '*', '/') separated by some number of spaces.

• s represents a valid expression.

• All the integers in the expression are non-negative integers in the range [0, 231 - 1].

The answer is guaranteed to fit in a 32-bit integer.

Note: You are not allowed to use any built-in function which evaluates strings as mathematical expressions, such as eval().

Test cases:

1.Input: s = "3+2*2" Output: 7

2.Input: s = " 3/2 " Output: 1

3.Input: s = " 3+5 / 2 " Output: 5

4.s= “-1+5”

5.s= “2+3+5”

calculate.py - C:/Users/ganes/AppData/Local/Programs/Python/Python311/calculate.py (3.11.4)

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```python
def calculate(s):
    stack = []
    num = 0
    sign = '+'
    for i in range(len(s)):
        if s[i].isdigit():
            num = num * 10 + int(s[i])
        if (not s[i].isdigit() and s[i] != ' ') or i == len(s) - 1:
            if sign == '+':
                stack.append(num)
            elif sign == '-':
                stack.append(-num)
            elif sign == '*':
                stack.append(stack.pop() * num)
            elif sign == '/':
                stack.append(int(stack.pop() / num))
            sign = s[i]
            num = 0
    return sum(stack)
```

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```
Python 3.11.4 (tags/v3.11.4:d2340ef, Jun  7 2023, 05:45:37) [MSC v.1934 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/ganes/AppData/Local/Programs/Python/Python311/calculate.py
>>> 3+2*2
7
>>>
```

Ln: 7 Col: 0

4. Raju, has again started troubling people in your city. The people have turned on to you for getting rid of Raju. Raju presents to you a number consisting of numbers from 0 to 9 characters. He wants you to reverse it from the final answer such that the number becomes Mirror number. A Mirror is a number which equals its reverse. The hope of people are on you so you have to solve the riddle. You have to tell if some number exists which you would reverse to convert the number into Mirror .

Sample input:

Enter the number: 123456

Sample output:

Mirror image: 654321

Test cases:

1. Sell123

2. 5489236
3. Abc-abc
4. %$$$$^&
5. -123456

```python
def is_mirror_number(num):
    return str(num) == str(num)[::-1]

number = input("Enter a number: ").strip()
if number.isdigit():
    number = int(number)

    if is_mirror_number(number):
        print("The number is already a mirror number!")
    else:
        print("The number is not a mirror number.")
else:
    print("Invalid input. Please enter a valid number.")
```

```
Python 3.11.4 (tags/v3.11.4:d2340ef, Jun  7 2023, 05:45:37) [MSC v.1934 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/ganes/AppData/Local/Programs/Python/Python311/image.py
Enter a number:
=== RESTART: C:/Users/ganes/AppData/Local/Programs/Python/Python311/image.py ===
Enter a number: 123456
The number is not a mirror number.
>>>
```

5. Write a python function called matches that takes two strings as arguments and returns how many matches there are between the strings. A match is where the two strings have the same character at the same index.

Test Cases:

1. Input: s1= “what” s2= “watch” Output: 1
2.Input: s1= “ ran” s2= “van”
3. Input : s1 = “ rain” s2 = “ turn”
4.Input : s1 = “ python” s2 = “py”
5. Inpput: s1= “man” s2= “women

matches.py - C:/Users/ganes/AppData/Local/Programs/Python/Python311/matches.py (3.11.4)

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```python
def matches(str1, str2):
    return sum(a == b for a, b in zip(str1, str2))
string1 = input("Enter the first string: ")
string2 = input("Enter the second string: ")
match_count = matches(string1, string2)
print("Number of matches between the strings:", match_count)
```

IDLE Shell 3.11.4

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```
Python 3.11.4 (tags/v3.11.4:d2340ef, Jun  7 2023, 05:45:37) [MSC v.1934 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>
= RESTART: C:/Users/ganes/AppData/Local/Programs/Python/Python311/matches.py
Enter the first string: what
Enter the second string: watch
Number of matches between the strings: 1
>>
```

Ln: 8 Col: 0