PPL Lab Assignment 2

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- Problem Statement : Write a Python Program to check if a Number is a Strong Number.

- Objectives :

  1. To learn about the python programming using control structure.

  2. To understand the concept of interpreted language working.

- Theory :

  - Strong Number : Strong number is a special number whose sum of factorial of digits is equal to the original number. For example, 145 is a strong number. Since, 1! + 4! + 5! = 145

  - Python has clean object-oriented design, provides enhanced process control capabilities, and possesses strong integration and text processing capabilities and its own unit testing framework, all of which contribute to the increase in its speed and productivity. Python is considered a viable option for building complex multi-protocol network applications.

- Thus, Python can be used to realise the mentioned program effectively and easily.

- Algorithm :

1. Ask user to input an Integer to check.
2. Isolate the digits of the Integer.
3. Find factorials of all of the isolated digits.
4. Find sum of the factorials.
5. Check if the sum is equal to the original Input.
6. Display Results.

- Problem Solution :

1. Take in an integer and store it in a variable.

2. Using two while loops, find the factorial of each of the digits in the number.

3. Then sum up all the factorials of the digits.

4. Check if the sum of the factorials of the digits is equal to the number.

5. Print the final result.

6. Exit.

- Steps for Implementation :

1. User must enter the number and store it in a variable.

2. A copy of the original number is made as the original value will get altered in the later course of the program.

3. Using a while loop, each of the digits of the numbers is obtained.

4. Then the other while loop is used to find the factorial of the individual digits and store it in a sum variable.

5. If the sum of the factorial of the digits in a number is equal to the original number, the

number is a strong number.

6. The final result is printed.

- Platform : Ubuntu
- Input : n = 145
- Output : Yes
- Sum of digit factorials = 1! + 4! + 5! = 1 + 24 + 120 = 145
- Input : n = 534
- Output : No
- FAQs :

1. State the difference between a list and a tuple.

> The Key Difference between a List and a Tuple. The main difference between lists and tuples is the fact that lists are mutable whereas tuples are immutable.

2. Justify the difference between the append() and extend() functions for list operations.

> When append() method adds its argument as a single element to the end of a list, the length of the list itself will increase by one. Whereas extend() method iterates over its argument adding each element to the list, extending the list.

3. Compare the mutable and immutable objects in python.

> Every variable in python holds an instance of an object. There are two types of objects in python i.e. Mutable and Immutable objects. Whenever an object is instantiated, it is assigned a unique object id. The type of the object is defined at the runtime and it can't be changed afterwards. However, it's state can be changed if it is a mutable object.

To summarise the difference, mutable objects can change their state or contents and immutable objects can't change their state or content.

4. What is a dictionary in Python?

> A dictionary is a collection which is unordered, changeable and indexed. In Python dictionaries are written with curly brackets,

and they have keys and values.

5. What would be the output the following code block?

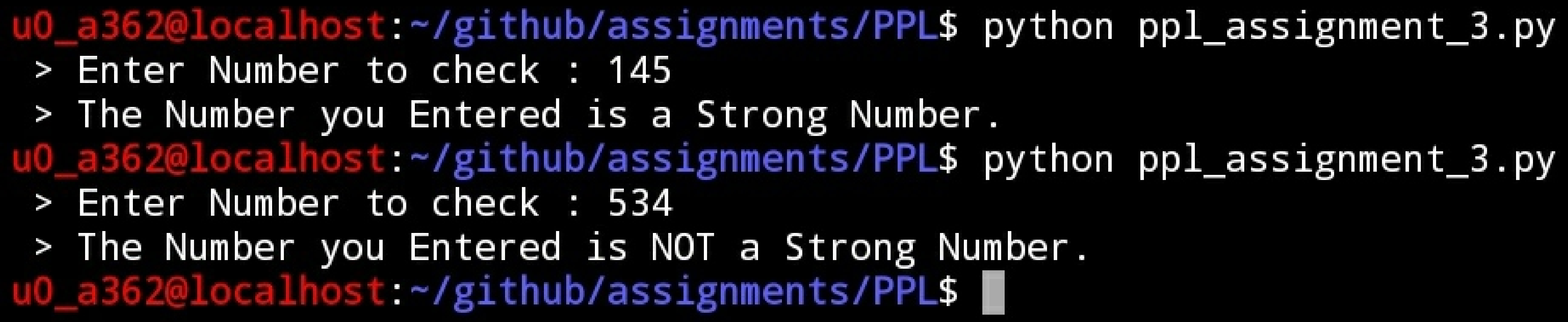
```
list1 = [2, 33, 222, 14,25]

print(list1[-2])
```

> 14

- Practice Assignments:

  - Python Program to Check Whether a Number is Positive or Negative
  - Python Program to Check if a Number is a Palindrome
  - Python Program to Check if a Number is a Perfect Number
  - Python Program to Check if a Number is a Prime Number
  - Python Program to Find the Sum of the Digits of the Number.
  - Python Program to Find the Factorial of the Number.

```python

# PPL Lab Assignment 3, PG43 Jaynam Modi, G3

# Write a Python Program to check if a Number is a Strong Number.

def factorial(inp):
    fact = 1
    for x in range(1, inp+1):
        fact = fact * x
    return fact

def isStrong(inp):
    strong_check = 0
    inp = str(inp)

    for x in inp:
        strong_check += factorial(int(x))

    return int(inp) == strong_check


n = input(" > Enter Number to check : ")

if isStrong(n):
    print(" > The Number you Entered is a Strong Number.")
else:
    print(" > The Number you Entered is NOT a Strong Number.")

# PRACTICE PROBLEMS.

# 1. Python Program to Check Whether a Number is Positive or Negative.

def checkPositivity(n):
    if n == 0:
        print(" > The number is neither Positive nor Negative.")
    elif n > 0:
        print(" > The number is Positive.")
    else:
        print(" > The number is Negative.")

# 2. Python Program to Check if a Number is a Palindrome.

def checkPalindrome(n):
    rev = str(n)[::-1]
    return n == rev

# 3. Python Program to Check if a Number is a Perfect Number.

def isPerfect(n):
    perfect_check = 0
    for x in range(1, n):
        if n // x == 0:
            perfect_check += x
    return n == perfect_check

# 4. Python Program to Check if a Number is a Prime Number.

def isPrime(n):
    flag = 0
    for x in range(2, n):
        if n // x == 0:
            flag += 1
    return flag == 0

# 5. Python Program to Find the Sum of the Digits of the Number.

def sumOfDigits(n):
    sum_digits = 0
    for x in str(n):
        sum_digits += int(x)
    return sum_digits

# 6. Python Program to Find the Factorial of the Number.

def factorial(inp):
    fact = 1
    for x in range(1, inp+1):
        fact = fact * x
    return fact
```



```
u0_a362@localhost:~/github/assignments/PPL$ python ppl_assignment_3.py
 > Enter Number to check : 145
 > The Number you Entered is a Strong Number.
u0_a362@localhost:~/github/assignments/PPL$ python ppl_assignment_3.py
 > Enter Number to check : 534
 > The Number you Entered is NOT a Strong Number.
u0_a362@localhost:~/github/assignments/PPL$ 
```