National Technical University of Ukraine
“Igor Sikorsky Kyiv Polytechnic Institute”
Faculty of Informatics and Computer Science
Department of Information Systems and Technologies

Laboratory work № 2

“Data Analysis using Python Language”

Performed by:
student of group IM-14
Full name KULUBECİOGLU Mehmet

Compiled by:
Yulia Timofeeva

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Statistical analysis

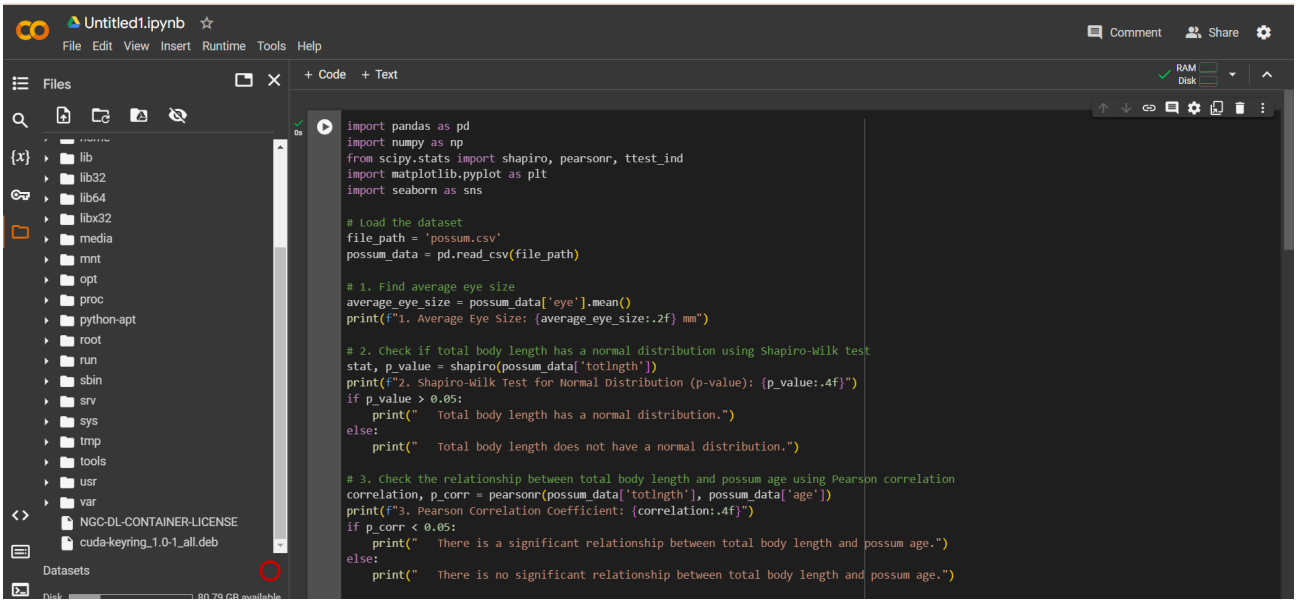
Tasks

Create a Python program that does task according to your number in the group list.

My variant 3 ;
3.File possum.csv.

1. Find average eye size.
2. Does the total body length have normal distribution?
3. Is there a relationship between total body length and possum age?
4. Test hypothesis that total body length of Victoria province possums is not
5. different from possums of other provinces

MY FULL CODES:



```python
# 4. Test hypothesis that total body length of Victoria province possums is not different from other provinces
vic_possums = possum_data[possum_data['Pop'] == 'Vic']['totlngth']
other_possums = possum_data[possum_data['Pop'] != 'Vic']['totlngth']

t_stat, p_value_ttest = ttest_ind(vic_possums, other_possums)
print(f"4. Independent t-test p-value: {p_value_ttest:.4f}")
if p_value_ttest > 0.05:
    print("   There is no significant difference in total body length between Victoria and other provinces.")
else:
    print("   Total body length of Victoria province possums is significantly different from other provinces.")

# Additional: Visualize the relationship between total body length and age
sns.scatterplot(x='age', y='totlngth', data=possum_data)
plt.title('Relationship between Total Body Length and Possum Age')
plt.xlabel('Age')
plt.ylabel('Total Body Length')
plt.show()
```

MY OUTPUT:

```
1. Average Eye Size: 15.05 mm
2. Shapiro-Wilk Test for Normal Distribution (p-value): 0.3045
   Total body length has a normal distribution.
3. Pearson Correlation Coefficient: 0.2683
   There is a significant relationship between total body length and possum age.
4. Independent t-test p-value: 0.1820
   There is no significant difference in total body length between Victoria and other provinces.
```