

Practical Implementation Using Python Libraries

Ex 1: Performing a T-Test to compare means using scipy

```
from scipy.stats import ttest_ind

# Example data: Test scores of two classes
group1 = [85, 87, 90, 92, 88]
group2 = [78, 82, 85, 80, 84]

# Perform T-Test
t_stat, p_val = ttest_ind(group1, group2)
print(f"T-Statistic: {t_stat}, P-Value: {p_val}")
```

Ex 2: ANOVA for Comparing Group Means using statsmodels

```
import statsmodels.api as sm
from statsmodels.formula.api import ols

# Example data
data = {
    'Group': ['A', 'A', 'B', 'B', 'C', 'C'],
    'Score': [85, 87, 90, 92, 88, 89]
}
df = pd.DataFrame(data)

# Perform ANOVA
model = ols('Score ~ Group', data=df).fit()
anova_result = sm.stats.anova_lm(model, typ=2)
print(anova_result)
```

Ex 3: T-Test for Comparing Salaries using Pingouin

```
python
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import pingouin as pg

# Example data
data = {
    'Department': ['Marketing', 'Marketing', 'Engineering', 'Engineering'],
    'Salary': [50000, 52000, 60000, 62000]
}
df = pd.DataFrame(data)

# Perform T-Test
t_test = pg.ttest(df[df['Department'] == 'Marketing']['Salary'], df[df['Department'] ==
'Engineering']['Salary'])
print(t_test)
```