Mathematics Experiment Report

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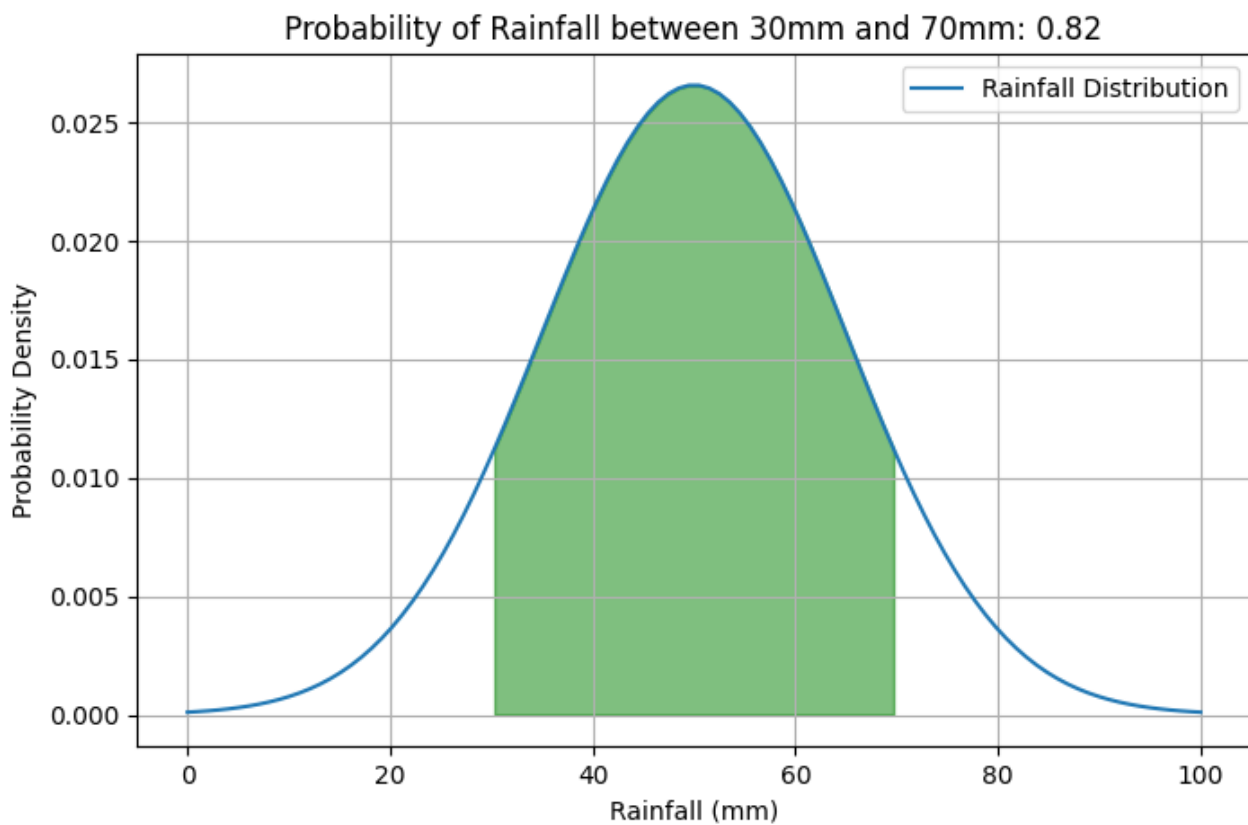
Rainfall Probability Estimation

Results:

Calculated Probability: 0.8176

Normal Distribution Parameters:

- Mean (mu) = 50

- Std Dev (sigma) = 15

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Experiment Code:

```python
import numpy as np
import scipy.integrate as spi
import matplotlib.pyplot as plt
from scipy.stats import norm

mu, sigma = 50, 15
pdf = lambda x: norm.pdf(x, mu, sigma)
prob, _ = spi.quad(pdf, 30, 70)

x = np.linspace(0, 100, 100)
y = pdf(x)

plt.figure(figsize=(8, 5))
plt.plot(x, y, label="Rainfall Distribution")
plt.fill_between(x, y, where=(x >= 30) & (x <= 70), color="green", alpha=0.5)
plt.xlabel("Rainfall (mm)")
plt.ylabel("Probability Density")
plt.title(f"Probability between 30mm-70mm: {prob:.2f}")
plt.legend()
plt.grid()
plt.show()
```