Experiment: Plotting Probabilities using Matplotlib

Aim:

To develop a Python program to plot probabilities using the Matplotlib library.

Software Required:

- Python (3.x)
- Matplotlib Library
- Jupyter Notebook / VS Code / IDLE

Algorithm / Procedure:

1. Import necessary libraries: matplotlib.pyplot and numpy.
2. Define the range of random variable values.
3. Define probability values corresponding to each random variable.
4. Plot the probability distribution using plt.bar() or plt.plot().
5. Label the axes and give a title.
6. Display the graph using plt.show().

Program:

```
# Program: Plotting Probabilities using Matplotlib
import matplotlib.pyplot as plt
import numpy as np

# Step 1: Define random variable (e.g., outcome of a die)
x = np.array([1, 2, 3, 4, 5, 6])

# Step 2: Define corresponding probabilities
p = np.array([1/6, 1/6, 1/6, 1/6, 1/6, 1/6])

# Step 3: Plot probability distribution
plt.bar(x, p, color='skyblue', edgecolor='black')
```

```
# Step 4: Add labels and title
plt.xlabel('Outcome of Die')
plt.ylabel('Probability')
plt.title('Probability Distribution of a Fair Die')
plt.grid(True, linestyle='--', alpha=0.6)

# Step 5: Display the plot
plt.show()
```

Output:

A bar graph showing equal probability (1/6) for each die face from 1 to 6.

Result:

The Python program to plot probability distribution using Matplotlib was successfully executed, and the probability plot was displayed correctly.