Program:

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import numpy as np
from matplotlib import pyplot as plt
from scipy import signal
# Define window parameter
N = 11 # Length of the window
n = np.arange(N)
# Rectangular window
win1 = np.ones(N)
print("Rectangular window:")
print(win1)
plt.subplot(5, 2, 1)
plt.stem(n, win1)
plt.title('Rectangular Window')
plt.xlabel('Time Range')
plt.ylabel('Weight')
a = 1
w, H = signal.freqz(win1, a)
Hm = np.abs(H)
Hdb = 20 * np.log10(Hm)
plt.subplot(5, 2, 2)
plt.plot(w / max(w), Hdb)
plt.title('Magnitude in dB (Rectangular)')
plt.xlabel('Normalized Frequency')
plt.ylabel('Magnitude (dB)')
plt.grid()

# Hamming window
win2 = signal.hamming(N)
print("Hamming window:")
print(win2)
```

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plt.subplot(5, 2, 3)
plt.stem(n, win2)
plt.title('Hamming Window')
plt.xlabel('Time Range')
plt.ylabel('Weight')
w, H = signal.freqz(win2, a)
Hm = np.abs(H)
Hdb = 20 * np.log10(Hm)
plt.subplot(5, 2, 4)
plt.plot(w / max(w), Hdb)
plt.title('Magnitude in dB (Hamming)')
plt.xlabel('Normalized Frequency')
plt.ylabel('Magnitude (dB)')
plt.grid()

# Hanning window
win3 = signal.hann(N)
print("Hanning window:")
print(win3)
plt.subplot(5, 2, 5)
plt.stem(n, win3)
plt.title('Hanning Window')
plt.xlabel('Time Range')
plt.ylabel('Weight')
w, H = signal.freqz(win3, a)
Hm = np.abs(H)
Hdb = 20 * np.log10(Hm)
plt.subplot(5, 2, 6)
plt.plot(w / max(w), Hdb)
plt.title('Magnitude in dB (Hanning)')
plt.xlabel('Normalized Frequency')
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plt.ylabel('Magnitude (dB)')
plt.grid()

# Blackman window
win4 = signal.blackman(N)
print("Blackman window:")
print(win4)
plt.subplot(5, 2, 7)
plt.stem(n, win4)
plt.title('Blackman Window')
plt.xlabel('Time Range')
plt.ylabel('Weight')
w, H = signal.freqz(win4, a)
Hm = np.abs(H)
Hdb = 20 * np.log10(Hm)
plt.subplot(5, 2, 8)
plt.plot(w / max(w), Hdb)
plt.title('Magnitude in dB (Blackman)')
plt.xlabel('Normalized Frequency')
plt.ylabel('Magnitude (dB)')
plt.grid()

# Bartlett window
win5 = signal.bartlett(N)
print("Bartlett window:")
print(win5)
plt.subplot(5, 2, 9)
plt.stem(n, win5)
plt.title('Bartlett Window')
plt.xlabel('Time Range')
plt.ylabel('Weight')
```

```
w, H = signal.freqz(win5, a)

Hm = np.abs(H)

Hdb = 20 * np.log10(Hm)

plt.subplot(5, 2, 10)

plt.plot(w / max(w), Hdb)

plt.title('Magnitude in dB (Bartlett)')

plt.xlabel('Normalized Frequency')

plt.ylabel('Magnitude (dB)')

plt.grid()

plt.show()
```

Output: