In [2]:

```python
import numpy as np
import matplotlib.pyplot as plt
import math
from scipy.fftpack import fft2

# generate the original image
img = np.zeros((200,200))
for i in range(len(img)):
    for j in range(len(img[0])):
        # draw the triangle
        if i>95 and i<105 and j>(i+95)/2 and j<(305-i)/2:
            img[i][j]=255

# show the original image
plt.imshow(np.abs(img), cmap='gray')
plt.show()
```
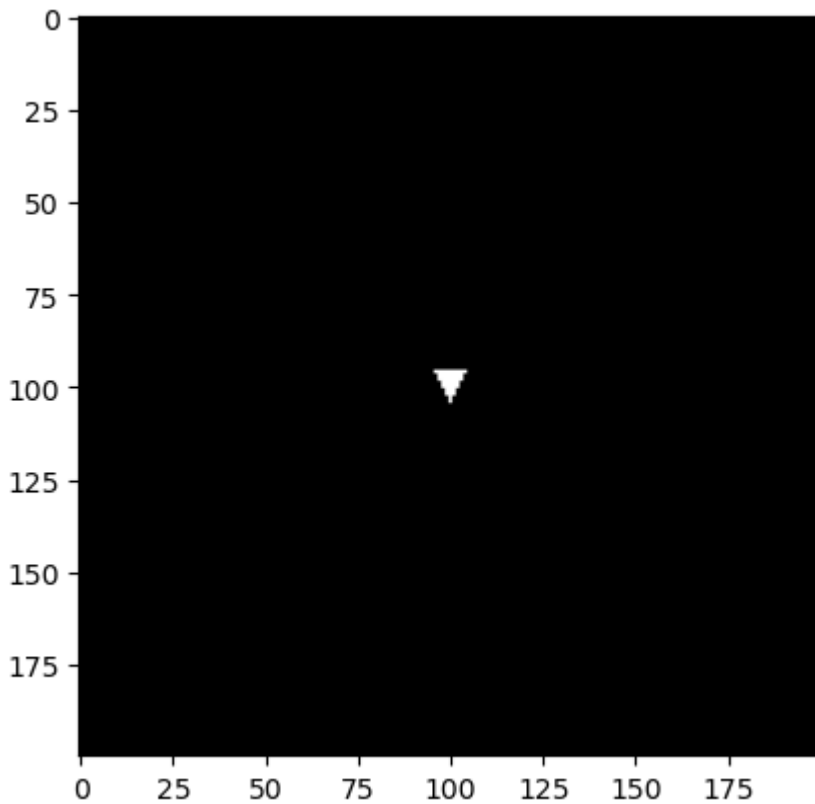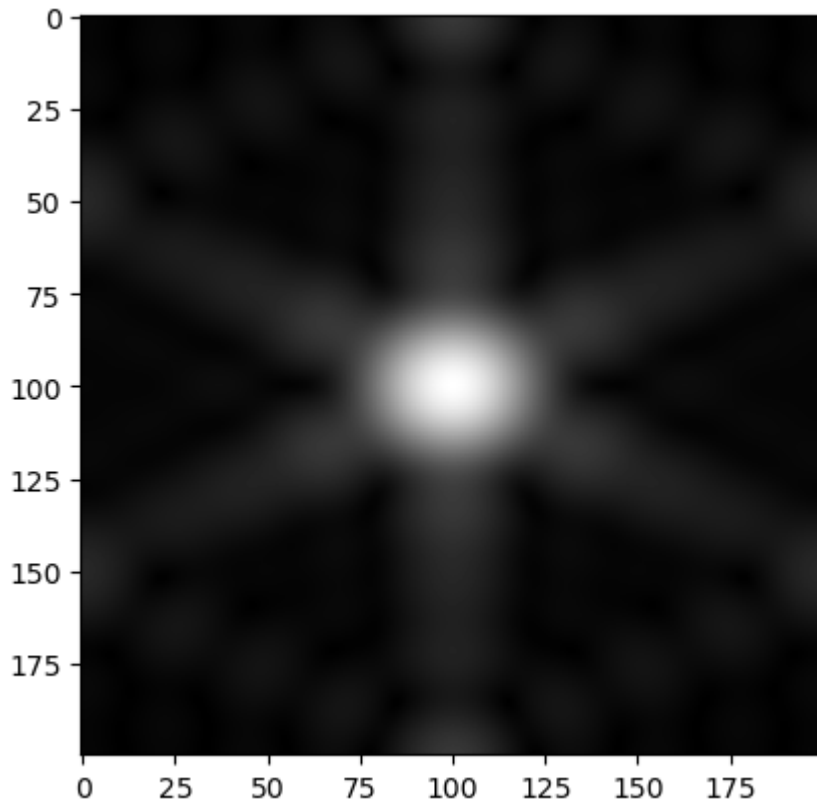
In [3]:

```python
for i in range(len(img)):
    for j in range(len(img[0])):
        img[i][j] = img[i][j]*math.pow(-1,i+j)

# Fourier transform
img = fft2(img)
# show the difraction image
plt.imshow(np.abs(img), cmap='gray')
plt.show()
```


In [ ]: