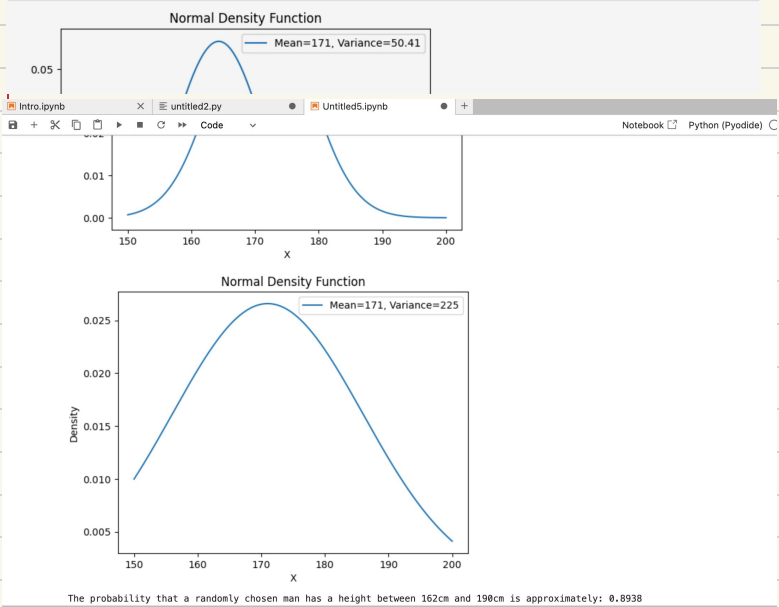
```python
import numpy as np
import matplotlib.pyplot as plt
from scipy import integrate

def normal_density(mean, variance, x):
    """
    Compute the normal density function for a given pair of mean and variance.

    Parameters:
    - mean: The expected value (average).
    - variance: The variance.
    - x: The value at which to compute the density function.

    Returns:
    The value of the normal density function at x.
    """
    exponent = -((x - mean)**2) / (2 * variance)
    return 1 / np.sqrt(2 * np.pi * variance) * np.exp(exponent)

def plot_normal_density(mean, variance, x_values):
    """
    Plot the normal density function for a given pair of mean and variance.

    Parameters:
    - mean: The expected value (average).
    - variance: The variance.
    - x_values: Array of x values for plotting.
    """
    density_values = [normal_density(mean, variance, x) for x in x_values]
    plt.plot(x_values, density_values, label=f"Mean={mean}, Variance={variance}")
    plt.xlabel('X')
    plt.ylabel('Density')
    plt.title('Normal Density Function')
    plt.legend()
    plt.show()
```

```python
def numerical_integration(mean, variance, a, b):
    """
    Numerically integrate the normal density function between two values a and b.

    Parameters:
    - mean: The expected value (average).
    - variance: The variance.
    - a, b: The interval for integration.

    Returns:
    The value of the numerical integration.
    """
    integrand = lambda x: normal_density(mean, variance, x)
    result, _ = integrate.quad(integrand, a, b)
    return result

# Plot normal density functions for different parameters
mean_values = [171, 171]  # One value for average male height
variance_values = [7.1**2, 15**2]  # Different variance values
x_values = np.linspace(150, 200, 1000)

for mean, variance in zip(mean_values, variance_values):
    plot_normal_density(mean, variance, x_values)

# Determine the probability that a randomly chosen man has a height between 162cm and 190cm
a, b = 162, 190
probability = numerical_integration(mean_values[0], variance_values[0], a, b)
print(f"The probability that a randomly chosen man has a height between {a}cm and {b}cm is approximately: {probability:.4f}")
```




```
The probability that a randomly chosen man has a height between 162cm and 190cm is approximately: 0.8938
```