Assignment No-05 :- Assignment based on plotting a normal distribution curve using python,

Without Using Inbuilt Functions

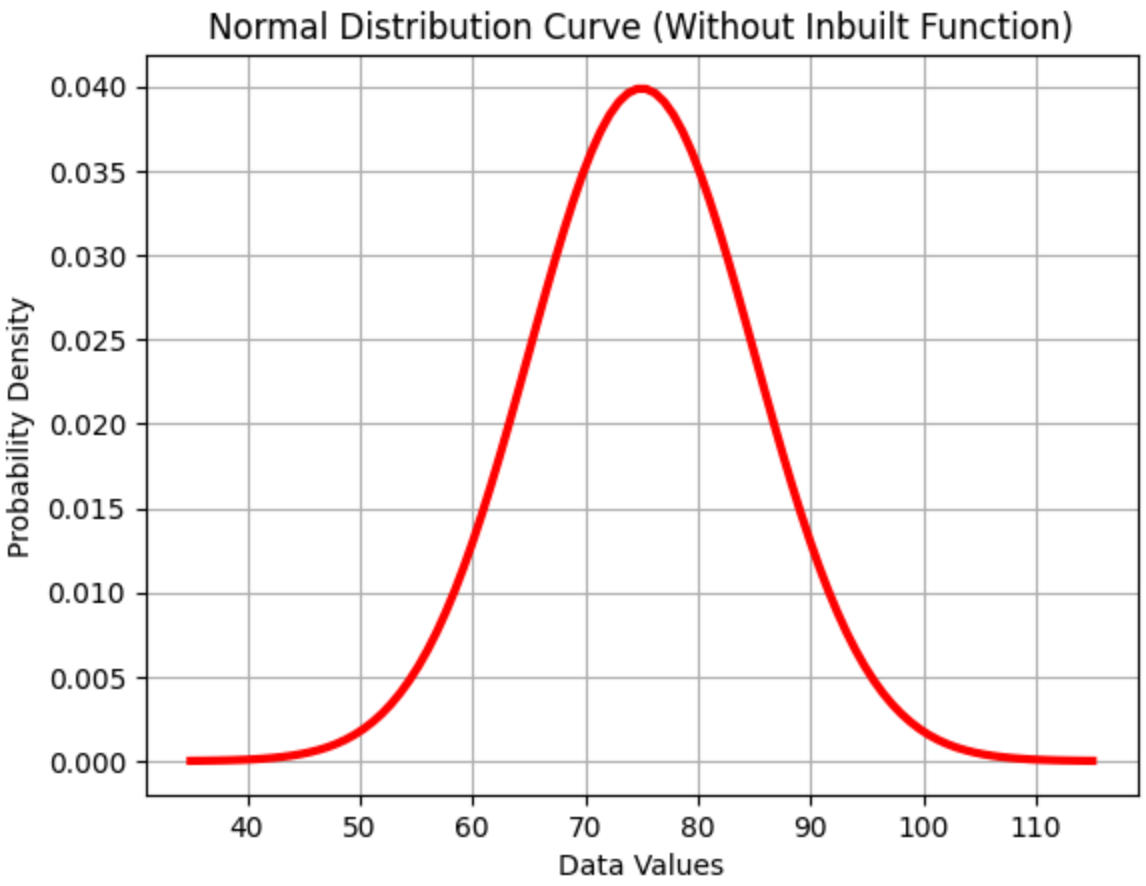
In [3]:
```
import numpy as np
import matplotlib.pyplot as plt
import math
```

In [4]:
```
mean = 75
std_dev = 10
```

In [5]:
```
# Generate x values
x = np.linspace(mean - 4*std_dev, mean + 4*std_dev, 100)
```

In [6]:
```
# Calculate y values manually using the PDF formula
y = [(1 / (std_dev * math.sqrt(2 * math.pi))) * math.exp(-((val - mean)**2) /
```

In [7]:
```
# Plot
plt.plot(x, y, color='red', linewidth=3)
plt.title('Normal Distribution Curve (Without Inbuilt Function)')
plt.xlabel('Data Values')
plt.ylabel('Probability Density')
plt.grid(True)
plt.show()
```



Using Inbuilt Functions

In [ ]:
```
# Plotting Normal Distribution using inbuilt functions
import numpy as np
import matplotlib.pyplot as plt
from scipy.stats import norm
```

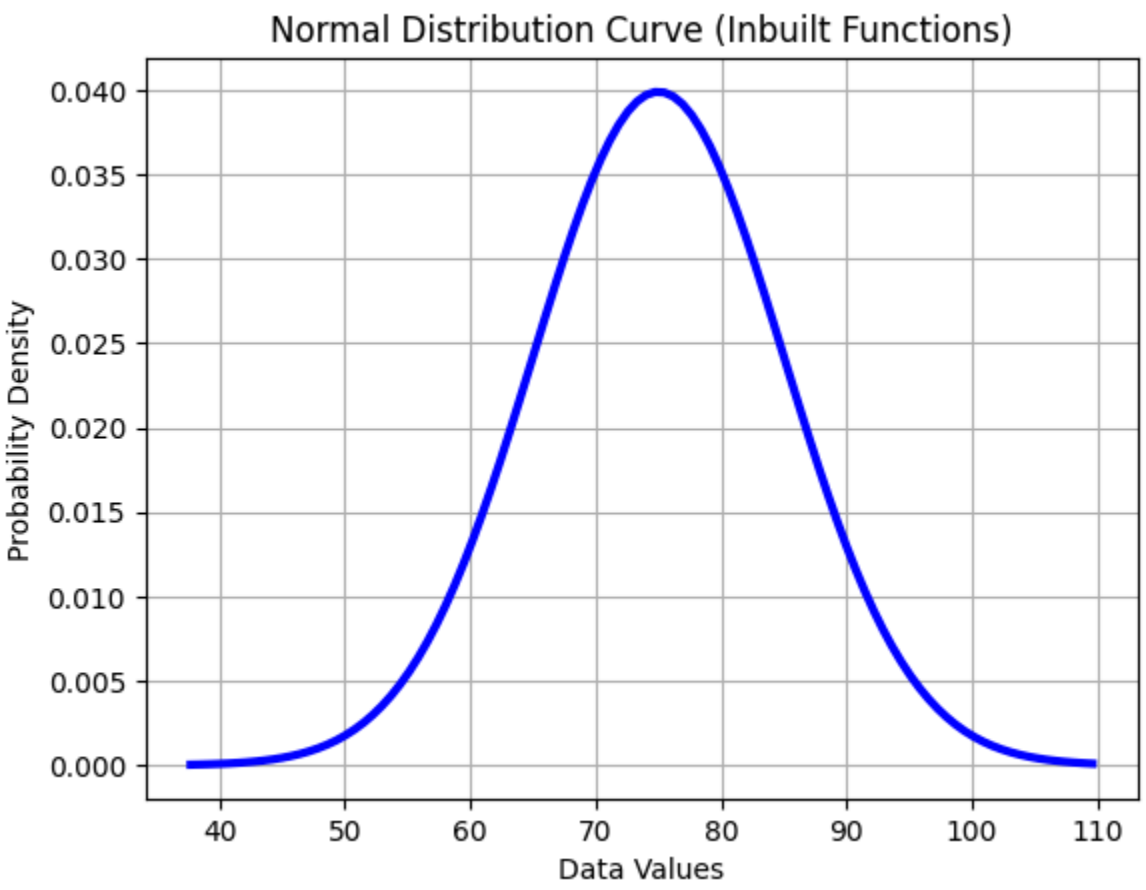
In [9]:
```
# Generate normally distributed data
mean = 75
std_dev = 10
data = np.random.normal(mean, std_dev, 1000)
```

In [10]:
```
# Create range for x-axis
x = np.linspace(min(data), max(data), 100)
```

In [11]:
```
# Calculate probability density function
pdf = norm.pdf(x, mean, std_dev)
```

In [12]:
```
# Plot
plt.plot(x, pdf, color='blue', linewidth=3)
plt.title('Normal Distribution Curve (Inbuilt Functions)')
plt.xlabel('Data Values')
plt.ylabel('Probability Density')
plt.grid(True)
```

```
plt.show()
```


Normal Distribution Curve (Inbuilt Functions)
Probability Density
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
40
50
60
70
80
90
100
110
Data Values

In [ ]: