DL1_C5_S6_Practice

In [15]:
```
import statistics as st
import math
import numpy as np
import seaborn as sns
import matplotlib.pyplot  as plt
from scipy.stats import norm
```

Task 1: Real Estate Survey Analysis

H0 = Avg price per sqft is 33.88 dollars in 2020 meu=33.88 H1 = mu < 33.88 & mu > 33.88

A : Determine the type of tail-test

H0 = Avg price per sqft is 33.88 dollars in 2020 meu=33.88 H1 = mu < 33.88 & mu > 33.88
Alternate Hypothsis we have to prove Avg is not 33.88 so its both side tail test

Task 1.B : Calculate z-critical

In [2]:
```
x_samp= 32.18
mu_popmean = 33.88
sd = 1.28
samp =  49
alpha=0.05
```

In [3]:
```
z_critical = norm.ppf(1-alpha/2)
print("The z-critical is", z_critical)
```

```
The z-critical is 1.959963984540054
```

Task 1.C: Test Statistics(z_statistic)

In [4]:
```
z_statistic = (x_samp- mu_popmean)/(sd/(samp)**0.5)
print("The Z statistics is ", abs(z_statistic))
```

```
The Z statistics is  9.296875000000016
```

Task 1.D : p-value

In [5]:
```
p_value = norm.sf(abs(z_statistic))
print("The p_value is ",p_value*2)
```

```
The p_value is  1.4463410868771357e-20
```

Task 1.E : Draw the Conclusion

i. If p-value < alpha : Rejection of Null Hypothesis(H0)
p_value = 1.44e-20 p_value < alpha which means not to acceptance of Null Hypothesis. so, inconclusion H1 is True that is price of house is not 33.88 sqft.

ii. If -(z-critical) > z-statistics > +(z-critical) : Rejection of Null Hypothesis(H0) z-critical = 1.95 Z statistics = 9.29 z-critical < z-statistics which means not to acceptance of Null Hypothesis. so, inconclusion null Hypothesis is false and it can be rejected.

Task 2 : Sports Metrics Analysis

H0 = Mac throw farther than 85 H1 = mean distance of throws is 87.5 yards mu <= 87.5 Right tail test

Task 2.B : Calculate z-critical

In [6]:
```
x_samp= 87.5
mu_popmean = 85
sd = 2.1
samp = 32
alpha= 0.05
```

In [7]:
```
z_critical = norm.ppf(1-alpha)
print("The z-critical is", z_critical)
```

```
The z-critical is 1.6448536269514722
```

Task 2.C: Test Statistics(z_statistic)

In [8]:
```
z_statistic = (x_samp - mu_popmean)/(sd/(samp)**0.5)
print("The Z statistics is ", abs(z_statistic))
```

```
The Z statistics is  6.734350297014738
```

Task 2.d : Calculate p-value

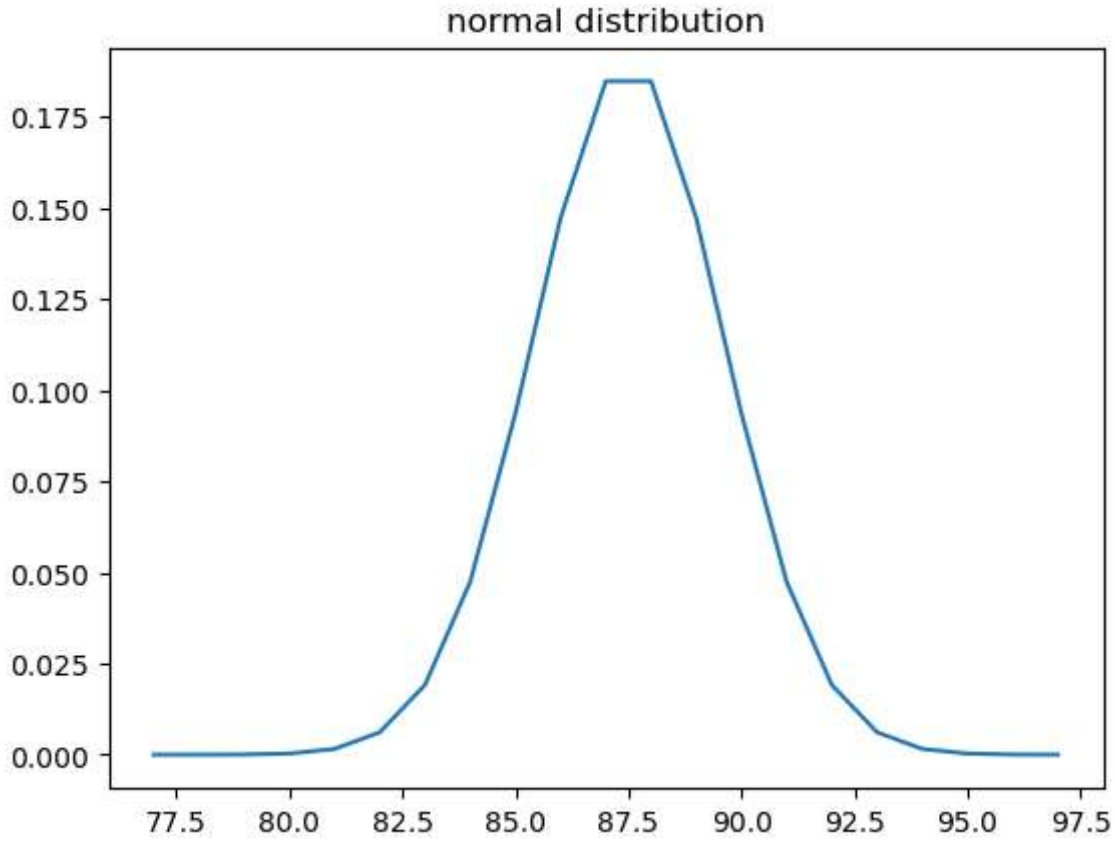
In [9]:
```
p_value = norm.sf(abs(z_statistic))
print("The p_value is ",p_value)
```

```
The p_value is  8.233201952582752e-12
```

Tasl 2.e : Sketch the graphs and state your conclusion

In [24]:
```
mean = 87.5
sd = 2.1

lower1 = mean-5*sd
upper1 = mean+5*sd
norm1=np.arange(lower1,upper1)
plt.plot(norm1,norm.pdf(norm1,mean,sd))
plt.figsize = (2,2)
plt.title("normal distribution")
plt.show()
```




```
i. If p-value < alpha : Rejection of Null Hypothesis(H0)
p_value = 8.23e-12 p_value < alpha which means not to acceptance of Null
Hypothesis. so, inconclusion H1 is True that is price


ii. If -(z-critical) > z-statistics > +(z-critical) : Rejection of Null
Hypothesis(H0)
```

z-critical = 1.64 Z statistics = 6.73 z-critical < z-statistics which means not to acceptance of Null Hypothesis. so, inconclusion null Hypothesis is false and it can be rejected.