- NAME:RAIYAN RIYAZ CHANDLE
- ROLL NO:B15
- PRN:2324000573
- EXPERIMENT NO:1
- TITLE: GAUSSIAN DISTRIBUTION

```
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
```

```
x=3
mean=0
sd=1
def normalDistribution(x,mean,sd):
  probDensity=(1/(np.sqrt(2*np.pi)*sd)*np.exp(-0.5*((x-mean)/sd)**2))
  return probDensity

result=normalDistribution(x,mean,sd)
print(result)
```

```
0.0044318484119380075
```

```
x1=21
mean1=0
sd1=1
def standardNormalDistribution(x1,mean1,sd1):
  return np.random.normal(mean1,sd1,x1)

data1=standardNormalDistribution(x1,mean1,sd1)
print(data1)
```

```
[ 0.67646246 -0.06475625  0.58950019  0.26639729 -0.59079228 -0.05566598
  0.08327087  0.4711126   0.94043893  1.29982386 -0.03487146  0.14824185
  0.20626747  0.52159109  1.0063255   1.10026902 -0.79959369 -1.34830303
  0.28476124 -2.15598966 -1.23434244]
```

```
mean2=np.mean(data1)
sd2=np.std(data1)
var2=np.var(data1)
print(f"mean= {mean2}")
print(f"sd= {sd2}")
print(f"var= {var2}")
```

```
mean= 0.062387980483330684
sd= 0.8514650969067453
var= 0.7249928112504131
```

```
new_data=np.linspace(-1,1,21)
print(new_data)
distribution_data=normalDistribution(new_data,mean,sd)
print(distribution_data)
plt.plot(new_data,distribution_data)
```

```
[-1.  -0.9 -0.8 -0.7 -0.6 -0.5 -0.4 -0.3 -0.2 -0.1  0.   0.1  0.2  0.3
  0.4  0.5  0.6  0.7  0.8  0.9  1. ]
[0.24197072 0.26608525 0.28969155 0.31225393 0.3332246  0.35206533
 0.36827014 0.38138782 0.39104269 0.39695255 0.39894228 0.39695255
 0.39104269 0.38138782 0.36827014 0.35206533 0.3332246  0.31225393
 0.28969155 0.26608525 0.24197072]
[<matplotlib.lines.Line2D at 0x7c4a180b6d90>]
```