EXPERIMENT NO : 5

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AIM : To solve the problems for continuous random variables using Normal and Uniform Probability Distributions.

In [28]:

```
import numpy as np
from scipy.stats import norm, uniform
```

1.Normal Distribution

In [29]:

```
mu = 0
```

In [30]:

```
sigma = 1
```

In [31]:

```
x = 0
```

In [32]:

```
pdf_value = norm.pdf(x, mu, sigma)
```

In [33]:

```
print("Probability density function at", x, ":", pdf_value)
```

```
Probability density function at 0 : 0.3989422804014327
```

In [34]:

```
cdf_value = norm.cdf(x, mu, sigma)
```

In [35]:

```
print("Cumulative distribution function at", x, ":", cdf_value)
```

```
Cumulative distribution function at 0 : 0.5
```

In [36]:

```
mean_value = norm.mean(mu, sigma)
print("Mean of the normal distribution:", mean_value)
```

```
Mean of the normal distribution: 0.0
```

In [37]:

```
variance_value = norm.var(mu, sigma)
```

In [38]:

```
print("Variance of the normal distribution:", variance_value)
```

```
Variance of the normal distribution: 1.0
```

In [39]:

```
std_deviation_value = norm.std(mu, sigma)
print("Standard deviation of the normal distribution:", std_deviation_value)
```

```
Standard deviation of the normal distribution: 1.0
```

SELF QUESTION

In [48]:

```
## Modules to be imported –
import numpy as np
from scipy.stats import norm, uniform
mu = 2
sigma = 3
x = 0
pdf_value = norm.pdf(x, mu, sigma)
print("Probability density function at", x, ":", pdf_value)
cdf_value = norm.cdf(x, mu, sigma)
print("Cumulative distribution function at", x, ":", cdf_value)
mean_value = norm.mean(mu, sigma)
print("Mean of the normal distribution:", mean_value)
variance_value = norm.var(mu, sigma)
print("Variance of the normal distribution:", variance_value)
std_deviation_value = norm.std(mu, sigma)
print("Standard deviation of the normal distribution:", std_deviation_value)
```

```
Probability density function at 0 : 0.10648266850745075
Cumulative distribution function at 0 : 0.2524925375469229
Mean of the normal distribution: 2.0
Variance of the normal distribution: 9.0
Standard deviation of the normal distribution: 3.0
```

2.Uniform Distribu&#xfffd;on

In [40]:

```
a = 0
b = 1
```

In [41]:

```
x = 0.5
pdf_value = uniform.pdf(x, a, b-a)
print("Probability density function at", x, ":", pdf_value)
```

```
Probability density function at 0.500000000000000 : 1.0
```

In [42]:

```
cdf_value = uniform.cdf(x, a, b-a)
print("Cumulative distribution function at", x, ":", cdf_value)
```

```
Cumulative distribution function at 0.500000000000000 : 0.5
```

In [43]:

```
p = 0.7
quantile_value = uniform.ppf(p, a, b-a)
print("Quantile function at", p, ":", quantile_value)
```

```
Quantile function at 0.700000000000000 : 0.7
```

In [44]:

```
mean_value = uniform.mean(a, b-a)
```

In [45]:

```
print("Mean of the uniform distribution:", mean_value)
```

```
Mean of the uniform distribution: 0.5
```

In [46]:

```
variance_value = uniform.var(a, b-a)
print("Variance of the uniform distribution:", variance_value)
```

```
Variance of the uniform distribution: 0.08333333333333333
```

In [47]:

```
std_deviation_value = uniform.std(a, b-a)
print("Standard deviation of the uniform distribution:", std_deviation_value)
```

```
Standard deviation of the uniform distribution: 0.28867513459481287
```

SELF QUESTION

In [50]:

```
a = 0
b = 1
x = 0.4
pdf_value = uniform.pdf(x, a, b-a)
print("Probability density function at", x, ":", pdf_value)
cdf_value = uniform.cdf(x, a, b-a)
print("Cumulative distribution function at", x, ":", cdf_value)
p = 0.7
quantile_value = uniform.ppf(p, a, b-a)
print("Quantile function at", p, ":", quantile_value)
mean_value = uniform.mean(a, b-a)
print("Mean of the uniform distribution:", mean_value)
variance_value = uniform.var(a, b-a)
print("Variance of the uniform distribution:", variance_value)
std_deviation_value = uniform.std(a, b-a)
print("Standard deviation of the uniform distribution:", std_deviation_value)
```

```
Probability density function at 0.400000000000000 : 1.0
Cumulative distribution function at 0.400000000000000 : 0.4
Quantile function at 0.700000000000000 : 0.7
Mean of the uniform distribution: 0.5
Variance of the uniform distribution: 0.08333333333333333
Standard deviation of the uniform distribution: 0.28867513459481287
```

Conclusion: The problems for continuous random variables using Normal and Uniform Probability Distributions are studied successfull.