

ML Lab Report 2

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Probability Density Function (Pdf) of values in x for normal distribution with mean and fixed deviation

In [52]:

```
import numpy as np
import matplotlib.pyplot as plt
from mpl_toolkits import mplot3d
from scipy.stats import norm
```

Task 1: Pdf for one value in x and mean distributed in 100 parts from 0-10

In [67]:

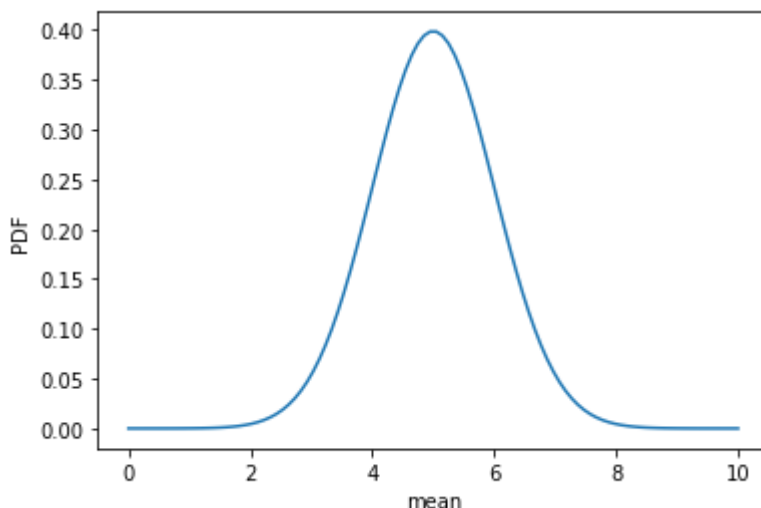
```
x = 5
m = np.linspace(0,10,100)
Y_ax = norm.pdf(x, m, 1 )
```

In [68]:

```
plt.plot(m, Y_ax)
plt.xlabel('mean')
plt.ylabel('PDF')
```

Out[68]:

Text(0, 0.5, 'PDF')



Task 2: Pdf for two value of x and rest same condition as above

In [56]:

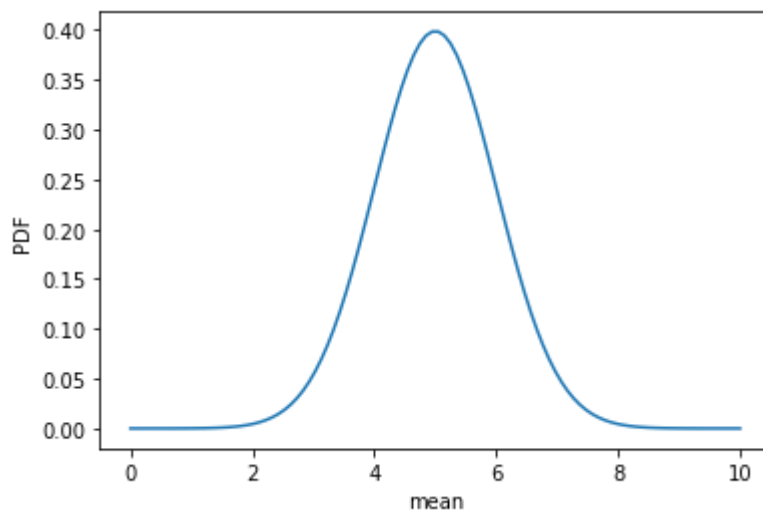
```
x = 5
x1 = 7
m = np.linspace(0,10,100)
Y_ax = norm.pdf(x, m, 1)*norm.pdf(x1, m, 1)
```

In [69]:

```
plt.plot(mu, Y_ax)
plt.xlabel('mean')
plt.ylabel('PDF')
```

Out[69]:

Text(0, 0.5, 'PDF')



Task 3: Pdf for ten value of x and rest same condition as above

Here i'm taking 10 values of x which are randomly generated with mean 5 and deviation 1

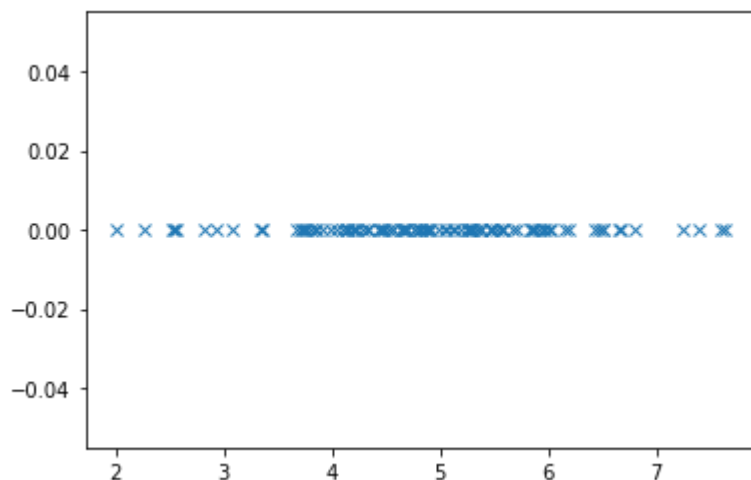
In [59]:

```
#x = [1,2,3,4,5,6,7,8,9,10]
#x = [4, 5, 7, 8, 8, 9, 10, 5, 2, 3, 5, 4, 8, 9]
x = np.random.normal(5, 1,10)
m = np.linspace(0,10,100)
```

Task 3.1: Plot of randomly generated value of x with 100 values and mean of 5 along with fixed deviation of 1

In [60]:

```
val = 0. # this is the value where you want the data to appear on the y-axis.
x = np.random.normal(5, 1, 100) # just as an example array
plt.plot(x, np.zeros_like(x) + val, 'x')
plt.show()
```



Task 3.2: Plot of pdf of randomly generated value of x with 10 values and mean of 5 along with fixed deviation of 1

In [61]:

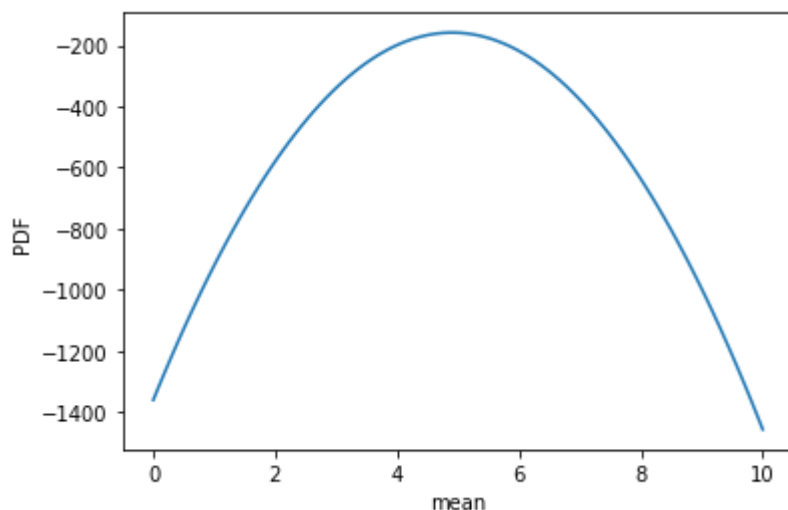
```
ll = 0
for i in x:
    ll += np.log(norm.pdf(i, m, 1))
```

In [62]:

```
plt.plot(m, ll)
plt.xlabel('mean')
plt.ylabel('PDF')
```

Out[62]:

Text(0, 0.5, 'PDF')



Plotting by directly multiplying them to get the total probability

In [63]:

```
ll = 1
for i in x:
    ll = ll*(norm.pdf(i, m, 1))
```

In [64]:

```
plt.plot(m, ll)
```

Out[64]:

```
[<matplotlib.lines.Line2D at 0x7fe07cb5d0f0>]
```

