

King David Concepcion

THE PRIOR

```
# -*- coding: utf-8 -*-  
"""
```

Created on Sat Mar 9 19:51:13 2024

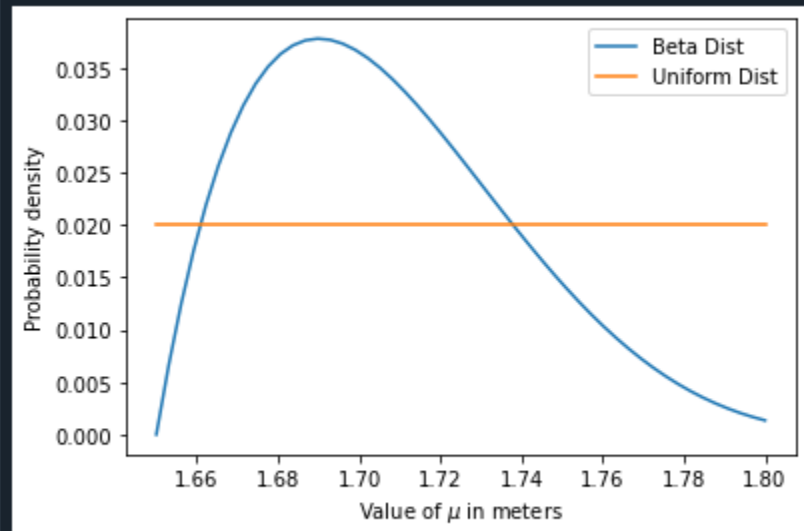
```
@author: (Kida)_KingDavidConcepcion  
"""
```

```
import scipy.stats as sts  
import numpy as np  
import matplotlib.pyplot as plt
```

```
mu = np.linspace(1.65, 1.8, num = 50)  
test = np.linspace(0, 2)  
uniform_dist = sts.uniform.pdf(mu) + 1
```

```
uniform_dist =  
uniform_dist/uniform_dist.sum()  
beta_dist = sts.beta.pdf(mu, 2, 5, loc = 1.65, scale = 0.2)  
beta_dist = beta_dist/beta_dist.sum()  
plt.plot(mu, beta_dist, label = 'Beta Dist')  
plt.plot(mu, uniform_dist, label = 'Uniform Dist')  
plt.xlabel("Value of  $\mu$  in meters")  
plt.ylabel("Probability density")  
plt.legend()
```

```
In [2]: runcell(0, 'C:/Users/Kida/untitled2.py')
```



```
In [3]:
```

```
1  # -*- coding: utf-8 -*-  
2  """  
3  Created on Sat Mar 9 19:51:13 2024  
4  
5  @author: (Kida)_KingDavidConcepcion  
6  """  
7  
8  import scipy.stats as sts  
9  import numpy as np  
10 import matplotlib.pyplot as plt  
11  
12 mu = np.linspace(1.65, 1.8, num = 50)  
13 test = np.linspace(0, 2)  
14 uniform_dist = sts.uniform.pdf(mu) + 1  
15  
16 uniform_dist = uniform_dist/uniform_dist.sum()  
17 beta_dist = sts.beta.pdf(mu, 2, 5, loc = 1.65, scale = 0.2)  
18 beta_dist = beta_dist/beta_dist.sum()  
19 plt.plot(mu, beta_dist, label = 'Beta Dist')  
20 plt.plot(mu, uniform_dist, label = 'Uniform Dist')  
21 plt.xlabel("Value of  $\mu$  in meters")  
22 plt.ylabel("Probability density")  
23 plt.legend()
```

THE LIKELIHOOD

```
# -*- coding: utf-8 -*-  
"""
```

Created on Sat Mar 9 20:03:49 2024

```
@author: (Kida)_KingDavidConcepcion  
"""
```

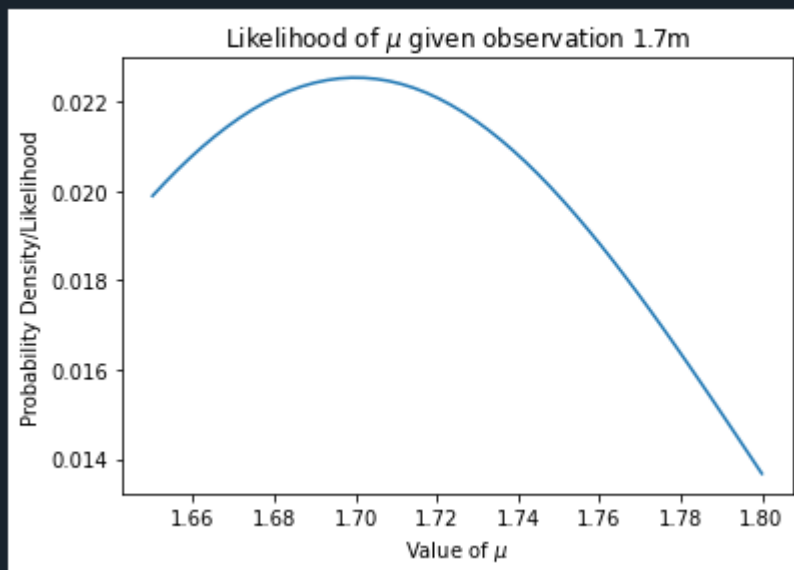
```
def likelihood_func(datum, mu):  
    likelihood_out = sts.norm.pdf(datum, mu, scale = 0.1)  
    return likelihood_out/likelihood_out.sum()
```

```
likelihood_out = likelihood_func(1.7, mu)
```

```
plt.plot(mu, likelihood_out)  
plt.title("Likelihood of  $\mu$  given observation 1.7m")  
plt.ylabel("Probability Density/Likelihood")  
plt.xlabel("Value of  $\mu$ ")  
plt.show()
```

```
1 # -*- coding: utf-8 -*-  
2 """  
3 Created on Sat Mar 9 20:03:49 2024  
4  
5 @author: (Kida)_KingDavidConcepcion  
6 """  
7  
8 def likelihood_func(datum, mu):  
9     likelihood_out = sts.norm.pdf(datum, mu, scale = 0.1)  
10     return likelihood_out/likelihood_out.sum()  
11  
12 likelihood_out = likelihood_func(1.7, mu)  
13  
14 plt.plot(mu, likelihood_out)  
15 plt.title("Likelihood of  $\mu$  given observation 1.7m")  
16 plt.ylabel("Probability Density/Likelihood")  
17 plt.xlabel("Value of  $\mu$ ")  
18 plt.show()
```

In [3]: runcell(0, 'C:/Users/Kida/untitled3.py')



THE POSTERIOR

```
# -*- coding: utf-8 -*-
```

```
"""
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Created on Sat Mar 9 20:12:38 2024

```
@author: (Kida)_KingDavidConcepcion
```

```
"""
```

```
import scipy as sp
```

```
unnormalized_posterior = likelihood_out * uniform_dist
```

```
plt.plot(mu, unnormalized_posterior)
```

```
plt.xlabel("$\mu$ in meters")
```

```
plt.ylabel("Unnormalized Posterior")
```

```
plt.show()
```

```
1  # -*- coding: utf-8 -*-
2  """
3  Created on Sat Mar 9 20:12:38 2024
4
5  @author: (Kida)_KingDavidConcepcion
6  """
7
8  import scipy as sp
9
10 unnormalized_posterior = likelihood_out * uniform_dist
11 plt.plot(mu, unnormalized_posterior)
12 plt.xlabel("$\mu$ in meters")
13 plt.ylabel("Unnormalized Posterior")
14 plt.show()
```

```
In [4]: runcell(0, 'C:/Users/Kida/untitled4.py')
```

