

# Mathematical and Computational Modelling



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Text

Welcome

Equations

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Example

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Feel free to contact me if you have any suggestions!

1. Simple
2. Clean
3. Oxford University Colours

Enjoy!

# Equations

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Let  $p(x) = \mathcal{N}(\mu_1, \sigma^2_1)$  and  $q(x) = \mathcal{N}(\mu_2, \sigma^2_2)$ :

$$\mathcal{N} = \frac{1}{\sigma \sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}} \quad (1)$$

Kullback-Leibler divergence for continuous probabilities:

$$\begin{aligned} D(p, q) &= \int p(x) \log \frac{p(x)}{q(x)} dx \\ &= \int p(x) \ln p(x) dx - \int p(x) \ln q(x) dx \\ &= \frac{1}{2} \ln (2 \pi \sigma_2^2) + \frac{\sigma_1^2 + (\mu_1 - \mu_2)^2}{2 \sigma_2^2} - \frac{1}{2} (1 + \ln 2 \pi \sigma_1^2) \\ &= \ln \frac{\sigma_2}{\sigma_1} + \frac{\sigma_1^2 + (\mu_1 - \mu_2)^2}{2 \sigma_2^2} - \frac{1}{2} \end{aligned}$$

Code

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## Greatest Common Divisor

```
1 def greatest_c_remainder(a,b):  
2     '''Greatest common divisor of a and b'''  
3     r = a % b  
4     if r == 0:  
5         return b  
6     else:  
7         m = b  
8         n = r  
9     return greatest_c_remainder(m,n)
```