Mathematical and Computational Modelling

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April, 2019

Text

1. Simple
2. Clean
3. Navy UL-FPP Colours

Equations

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

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

Kullback-Leibler divergence for continuous probabilities:

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

Code

Greatest Common Divisor

```python
def greatest_c_remainder(a,b):
    '''Greatest common divisor of a and b'''
    r = a % b
    if r == 0:
        return b
    else:
        m = b
        n = r
    return greatest_c_remainder(m,n)
```