**Gaussian Distribution Weights**

The intensity/height of the Gaussian distribution at any point (or, jump frequency) gives the relative fraction of the population of molecules with that jump frequency.

The relative fraction of the population of molecules will give us the weights.

The height of a normal density curve at a given point x is given by:

h = e[-0.5\*{(x-𝝁)/𝝈}^2] /𝝈√(2𝝿)

Link: <http://www.stat.yale.edu/Courses/1997-98/101/normal.htm>

**Calculation of Gaussian Distribution Heights**

Mean: 𝝁 = 800

StdDev: 𝝈 = 10% of 𝝁 = 800 / 10 = 80

At x = 𝝁

h𝝁 = e[-0.5\*{(𝝁 -𝝁)/𝝈}^2] /𝝈√(2𝝿)

= e0 /80√(2𝝿)

= 1/80√(1/2𝝿)

= 0.005

At x = 𝝁 + 0.5𝝈

h𝝁 + 0.5𝝈 = e[-0.5\*{(𝝁+0.5𝝈-𝝁)/𝝈}^2] /𝝈√(2𝝿)

= e[-0.5\*(0.5)^2] /80√(2𝝿)

= (e-0.125/80)√(1/2𝝿)

= 0.0044

At x = 𝝁 + 1.0𝝈

h𝝁 + 𝝈 = e[-0.5\*{(𝝁+1.0𝝈-𝝁)/𝝈}^2] /𝝈√(2𝝿)

= e[-0.5\*(1)^2] /(80√(2𝝿))

= e-0.5/(80\*√(2𝝿))

= 0.003

At x = 𝝁 + 1.5𝝈

h𝝁 + 1.5𝝈 = e[-0.5\*{(𝝁+1.5𝝈-𝝁)/𝝈}^2] /𝝈√(2𝝿)

= e[-0.5\*(1.5)^2] /(80√(2𝝿))

= (e-1.125/80)√(1/(2𝝿))

= 0.0016

At x = 𝝁 + 2.0𝝈

h𝝁 + 2.0𝝈 = e[-0.5\*{(𝝁+2.0𝝈-𝝁)/𝝈}^2] /𝝈√(2𝝿)

= e[-0.5\*(2)^2] /80√(2𝝿)

= (e-2/80)√(1/(2𝝿))

= 0.000674

At x = 𝝁 + 2.5𝝈

h𝝁 + 2.5𝝈 = e[-0.5\*{(𝝁+2.5𝝈-𝝁)/𝝈}^2] /𝝈√(2𝝿)

= e[-0.5\*(2.5)^2] /80√(2𝝿)

= (e-3.125/80)√(1/(2𝝿))

= 0.00022

So, we get the table of Jump Frequencies and Weights as shown below:

|  |  |
| --- | --- |
| **Jump Frequency** | **Weight** |
| x = 800 | 0.005 |
| x = 800+0.5𝝈 = 800+ 40 = 840 | 0.0044 |
| x = 800 + 𝝈 = 800+ 80 = 880 | 0.003 |
| x = 800+1.5𝝈 = 800+120 = 920 | 0.0016 |
| x = 800+2.0𝝈 = 800+160 = 960 | 0.000674 |
| x = 800+2.5𝝈 = 800+200 = 1000 | 0.00022 |