**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 = 20% of 𝝁 = 0.20 \* 800 = 160

At x = 𝝁

h𝝁 = e[-0.5\*{(𝝁 -𝝁)/𝝈}^2] /𝝈√(2𝝿)

= (e0 /160)√(1/2𝝿)

= (1/160)√(1/2𝝿)

= 0.0025

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] /160√(2𝝿)

= (e-0.125/160)√(1/2𝝿)

= 0.0022

At x = 𝝁 + 1.0𝝈

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

= e[-0.5\*(1)^2] /(160√(2𝝿))

= e-0.5/(160\*√(2𝝿))

= 0.0015

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] /(160√(2𝝿))

= (e-1.125/160)√(1/(2𝝿))

= 0.00081

At x = 𝝁 + 2.0𝝈

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

= e[-0.5\*(2)^2] /160√(2𝝿)

= (e-2/160)√(1/(2𝝿))

= 0.00034

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] /160√(2𝝿)

= (e-3.125/160)√(1/(2𝝿))

= 0.00011

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

|  |  |
| --- | --- |
| **Jump Frequency** | **Weight** |
| x = 800 | 0.0025 |
| x = 800+0.5𝝈 = 800+ 80 = 880 | 0.0022 |
| x = 800 + 𝝈 = 800+160 = 960 | 0.0015 |
| x = 800+1.5𝝈 = 800+240 = 1040 | 0.00081 |
| x = 800+2.0𝝈 = 800+320 = 1120 | 0.00034 |
| x = 800+2.5𝝈 = 800+400 = 1200 | 0.00011 |