**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 = 70000

StdDev: 𝝈 = 10% of 𝝁 = 70000 / 10 = 7000

At x = 𝝁

h𝝁 = e[-0.5\*{(𝝁 -𝝁)/𝝈}^2] /𝝈√(2𝝿)

= e0 /7000√(2𝝿)

= (1/7000)\*√(1/2𝝿)

= 0.000057

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] /7000√(2𝝿)

= (e-0.125/7000)√(1/2𝝿)

= 0.00005

At x = 𝝁 + 1.0𝝈

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

= e[-0.5\*(1)^2] /(7000√(2𝝿))

= 1/(7000\*√(2𝝿e))

= 0.000035

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] /(7000√(2𝝿))

= (e-1.125/7000)√(1/(2𝝿))

= 0.000019

At x = 𝝁 + 2.0𝝈

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

= e[-0.5\*(2)^2] /7000√(2𝝿)

= (e-2/7000)√(1/(2𝝿))

= 0.000008

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] /7000√(2𝝿)

= (e-3.125/7000)√(1/(2𝝿))

= 0.000003

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

|  |  |
| --- | --- |
| **Jump Frequency** | **Weight** |
| x = 70000 | 0. 000057 |
| x = 70000+0.5𝝈 = 70000+3500 = 73500 | 0. 00005 |
| x = 70000+ 𝝈 = 70000+7000 = 77000 | 0. 000035 |
| x = 70000+1.5𝝈 = 70000+10500 = 80500 | 0. 000019 |
| x = 70000+2.0𝝈 = 70000+14000 = 84000 | 0. 000008 |
| x = 70000+2.5𝝈 = 70000+17500 = 87500 | 0. 000003 |