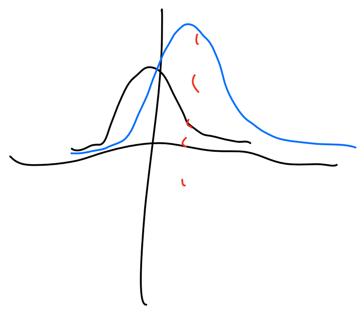
$$\rho(x,0) = \frac{1}{\sqrt{2\pi}} e^{-\frac{x^2}{2}}$$

$$S(x,\mu_p) = e^{-\frac{\left(\frac{x-\mu_p}{\sigma}\right)^2}{2}}$$

$$V_p(x,n) = \rho(x,n)\, S(x,\mu_p)\left(1 - \frac{1}{2} S(x,\mu_{\bar{p}})\right)$$

$$\rho(x,n+1) = \rho(x,n) + \sum_{\text{parties } p} \left(\frac{1}{R} V_p(xR - \mu_p R + \mu_p, n) - V_p(x,n)\right)$$



$$\frac{1}{\sqrt{2\pi}\,\sigma} e^{-\frac{\left(\frac{(xb - ab + a) - \mu}{\sigma}\right)^2}{2}}$$

$$\frac{1}{\sqrt{2\pi}\,\sigma} e^{-\frac{1}{2}\left(\frac{x - a + a/b - \mu/b}{\sigma/b}\right)^2}$$

$$\mu' = \mu/b + a - a/b$$

$$\sigma' = \sigma/b$$

$$c' = \frac{c}{b}$$

$$\left(C_1 e^{-\left(\frac{1}{2}\right)\left(\frac{1}{\sigma_1}\right)(x-\mu_1)^2}\right)\left(C_2 e^{-\left(\frac{1}{2}\right)\left(\frac{1}{\sigma_2}\right)(x-\mu_2)^2}\right)$$

$$= C_1 C_2 e^{-\left(\frac{1}{2}\right)\left(\frac{(x-\mu_1)^2}{\sigma_1} + \frac{(x-\mu_2)^2}{\sigma_2}\right)}$$

$$= C_1 C_2 e^{-\left(\frac{1}{2}\right)\left(\frac{1}{\sigma_1\sigma_2}\right)\left((\sigma_2+\sigma_1)x^2 - 2(\mu_1\sigma_2+\mu_2\sigma_1)x + (\sigma_2\mu_1^2+\sigma_1\mu_2^2)\right)}$$

$$= C_1 C_2 e^{-\left(\frac{1}{2}\right)\left(\frac{\sigma_2+\sigma_1}{\sigma_1\sigma_2}\right)\left(x^2 - 2\left(\frac{\mu_1\sigma_2+\mu_2\sigma_1}{\sigma_2+\sigma_1}\right)x + \left(\frac{\mu_1^2\sigma_2+\mu_2^2\sigma_1}{\sigma_2+\sigma_1}\right)\right)}$$

consider

$$x^2 - 2\left(\frac{\mu_1\sigma_2+\mu_2\sigma_1}{\sigma_2+\sigma_1}\right)x + \left(\frac{\mu_1^2\sigma_2+\mu_2^2\sigma_1}{\sigma_2+\sigma_1}\right)$$

$$= \left(x^2 - 2\left(\frac{\mu_1\sigma_2+\mu_2\sigma_1}{\sigma_2+\sigma_1}\right)x + \left(\frac{\mu_1\sigma_2+\mu_2\sigma_1}{\sigma_2+\sigma_1}\right)^2\right) + \left(\frac{\mu_1^2\sigma_2+\mu_2^2\sigma_1}{\sigma_2+\sigma_1}\right) - \left(\frac{\mu_1\sigma_2+\mu_2\sigma_1}{\sigma_2+\sigma_1}\right)^2$$

$$= \left(x - \left(\frac{\mu_1\sigma_2+\mu_2\sigma_1}{\sigma_2+\sigma_1}\right)\right)^2 + \frac{\underbrace{(\mu_1^2\sigma_2+\mu_2^2\sigma_1)(\sigma_2+\sigma_1) - (\mu_1\sigma_2+\mu_2\sigma_1)^2}}{(\sigma_2+\sigma_1)^2}$$

$$= \left(x - \left(\frac{\mu_1\sigma_2+\mu_2\sigma_1}{\sigma_2+\sigma_1}\right)\right)^2 + \frac{\cancel{\mu_1^2\sigma_2^2} + \mu_1^2\sigma_1\sigma_2 + \mu_2^2\sigma_1\sigma_2 + \cancel{\mu_2^2\sigma_1^2} - \cancel{\mu_1^2\sigma_2^2} - 2\mu_1\mu_2\sigma_1\sigma_2 - \cancel{\mu_2^2\sigma_1^2}}{(\sigma_2+\sigma_1)^2}$$

$$= \left(x - \left(\frac{\mu_1\sigma_2+\mu_2\sigma_1}{\sigma_2+\sigma_1}\right)\right)^2 + \frac{\sigma_1\sigma_2(\mu_1^2 - 2\mu_1\mu_2 + \mu_2^2)}{(\sigma_1+\sigma_2)^2}$$

$$= \left(x - \left(\frac{\mu_1\sigma_2+\mu_2\sigma_1}{\sigma_2+\sigma_1}\right)\right)^2 + \frac{\sigma_1\sigma_2(\mu_1-\mu_2)^2}{(\sigma_1+\sigma_2)^2}$$

$$= C_1 C_2 e^{-\left(\frac{1}{2}\right)\left(\frac{\sigma_2+\sigma_1}{\sigma_1\sigma_2}\right)\left(\left(x-\left(\frac{\mu_1\sigma_2+\mu_2\sigma_1}{\sigma_2+\sigma_1}\right)\right)^2+\left(\frac{\sigma_1\sigma_2(\mu_1-\mu_2)^2}{(\sigma_2+\sigma_1)^2}\right)\right)}$$

$$= C_1 C_2 \left(e^{-\left(\frac{1}{2}\right)\left(\frac{\sigma_2+\sigma_1}{\sigma_1\sigma_2}\right)\left(x-\left(\frac{\mu_1\sigma_2+\mu_2\sigma_1}{\sigma_2+\sigma_1}\right)\right)^2}\right)\left(e^{-\left(\frac{1}{2}\right)\left(\frac{\sigma_2+\sigma_1}{\sigma_1\sigma_2}\right)\left(\frac{\sigma_1\sigma_2(\mu_1-\mu_2)^2}{(\sigma_2+\sigma_1)^2}\right)}\right)$$

$$= C_1 C_2 e^{-\left(\frac{1}{2}\right)\left(\frac{(\mu_1-\mu_2)^2}{\sigma_2+\sigma_1}\right)} e^{-\left(\frac{1}{2}\right)\left(\frac{\sigma_2+\sigma_1}{\sigma_1\sigma_2}\right)\left(x-\left(\frac{\mu_1\sigma_2+\mu_2\sigma_1}{\sigma_2+\sigma_1}\right)\right)^2}$$

$$C' = C_1 C_2 e^{-\left(\frac{1}{2}\right)\left(\frac{(\mu_1-\mu_2)^2}{\sigma_2+\sigma_1}\right)}$$

$$\sigma' = \frac{\sigma_1\sigma_2}{\sigma_1+\sigma_2}$$

$$\mu' = \frac{\mu_1\sigma_2+\mu_2\sigma_1}{\sigma_2+\sigma_1}$$