Forventningsverdi og varians

For den SV $X \sim f(x)$ har vi

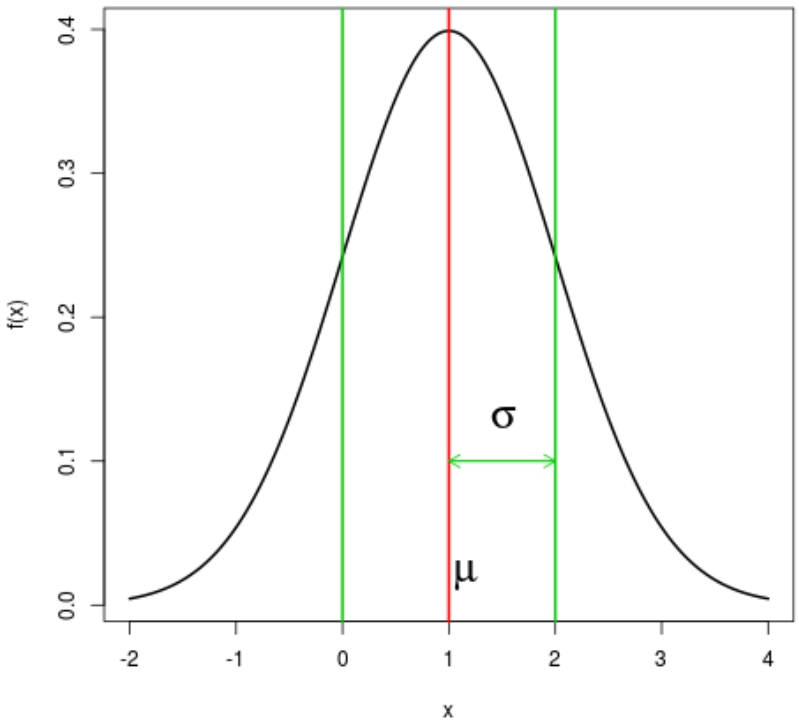
- Forventningsverdi
  - Diskret: $\mu_X = E[X] = \sum_x x\ f(x)$
  - Kontinuerlig: $\mu_X = E[X] = \int_{-\infty}^{+\infty} x\ f(x)dx$
- Varians

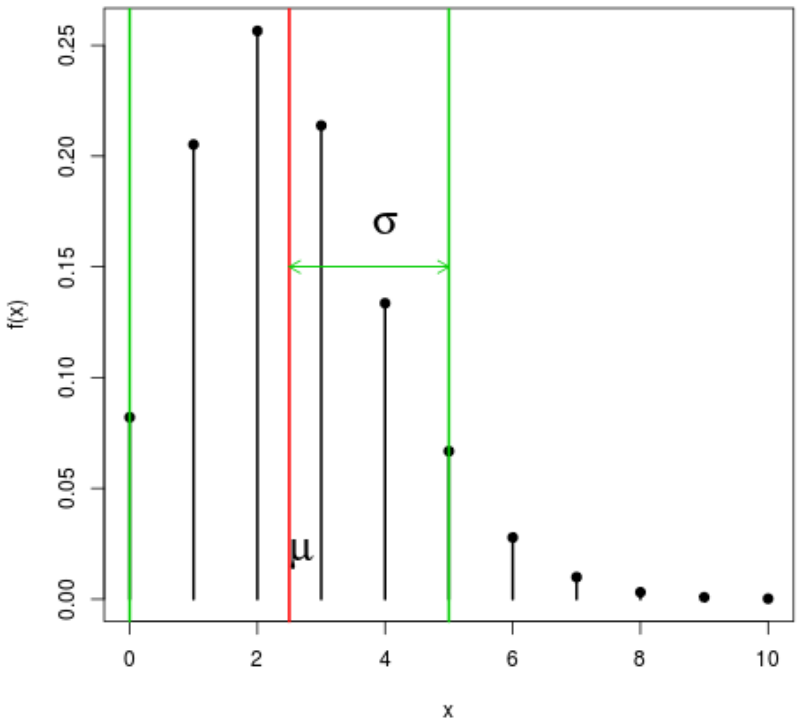
$$\sigma_X^2 = Var[X] = E[(X - \mu_X)^2]$$

- Standardavvik

$$\sigma_X = \sqrt{Var[X]}$$

Forventningsverdi og varians





- Forventningsverdi til $r(X)$ med $X \sim f(x)$

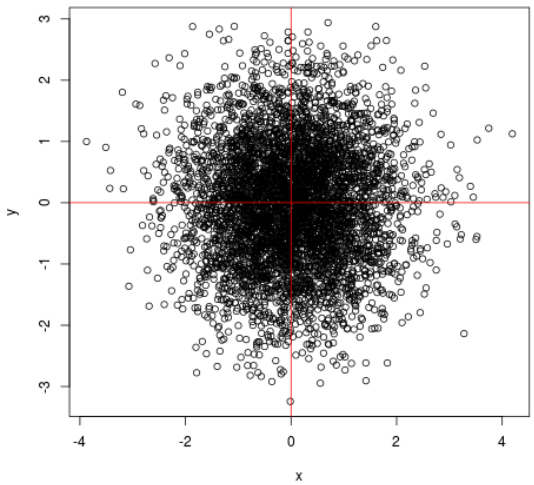
$$E[r(X)] = \begin{cases} \sum_x r(x)f(x), & \text{hvis } X \text{ er diskret} \\ \int_{-\infty}^{-\infty} r(x)f(x)dx, & \text{hvis } X \text{ er kontinuerlig} \end{cases}$$

$$E[r(X,Y)] = \begin{cases} \sum_x \sum_Y r(x,y)f(x,y), & \text{hvis } X, Y \text{ er diskret} \\ \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} r(x,y)f(x,y)dxdy, & \text{hvis } X, Y \text{ er kontinuerlig} \end{cases}$$

Plan for idag:

- Varians for Funksjoner av stokastiske variabler
- Kovarians og korrelasjon
- Regneregler for forventningsverdi og varians

Kovarians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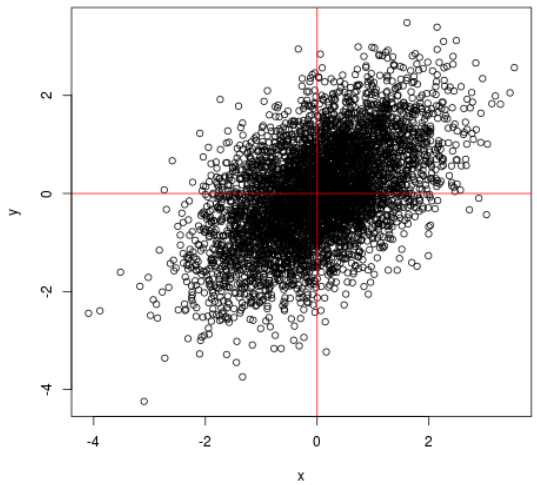
0
2
4
-3
-2
-1
0
1
2
3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x
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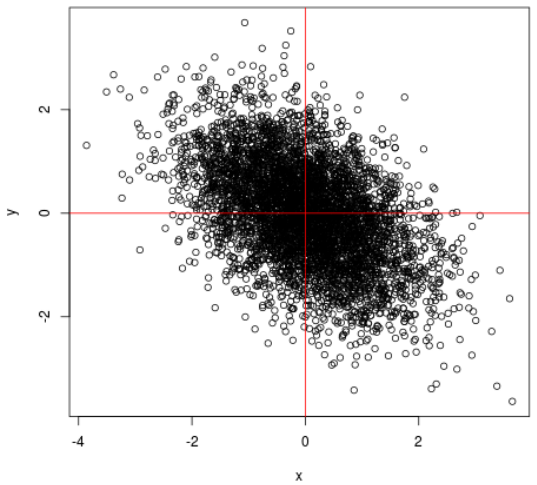
2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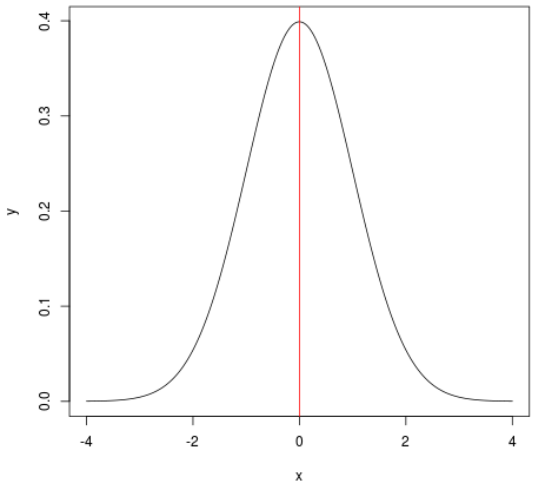
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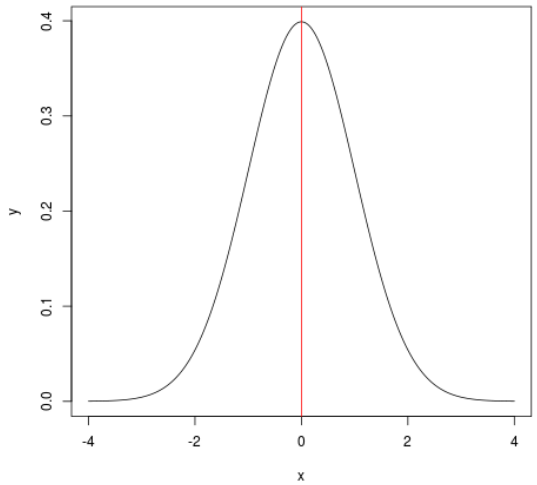
0.4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x
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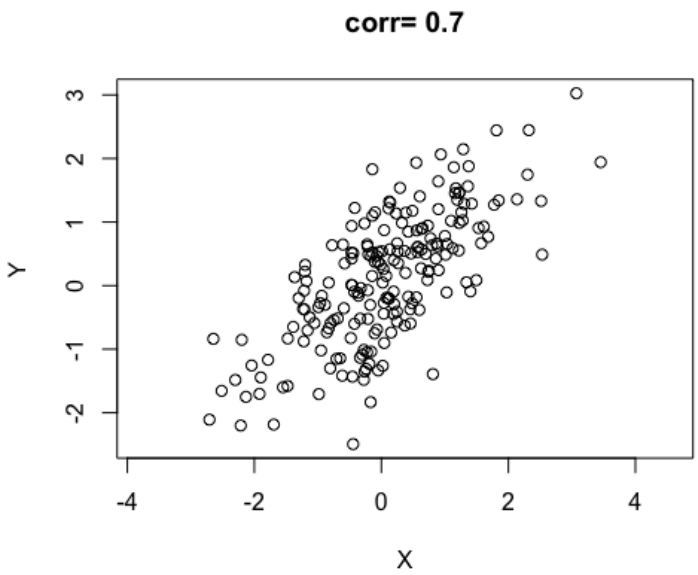
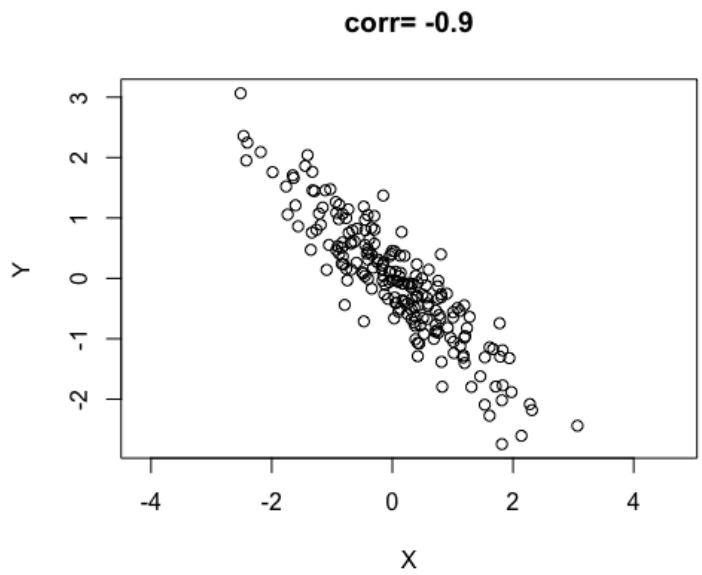
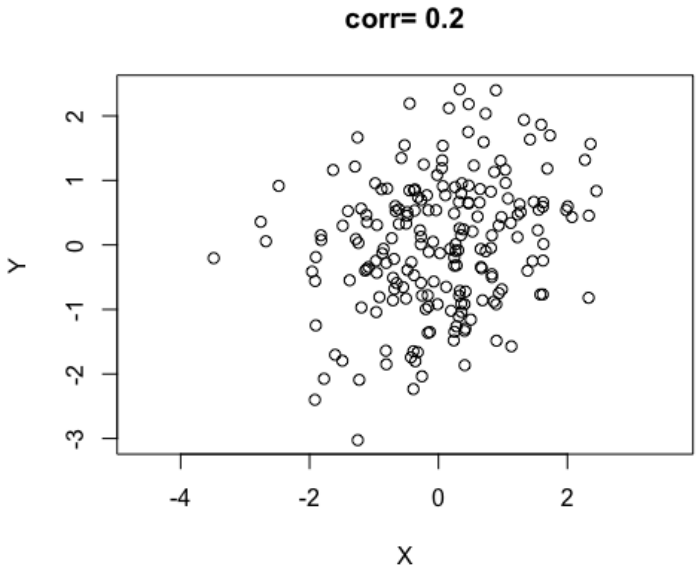
0.0
0.1
0.2
0.3
0.4

Korrelasjon







Korrelasjon