- $F_x(2) = P(X \leq 2)$
- Cumulant generating function = $\psi_x(t) = lnM_x(t)$
- E(h(x)) = $\int_{-\infty}^{\infty} h(x)f_x(x)dx$
- E(X) = $\sum_{i=1}^{\infty} x_i f_{x_i}(x)dx$ with discrete function

  E(X) = $\int_{-\infty}^{\infty} xf_x(x)dx$ with continuous function

  NB. –Boundaries depend on the definition of the function.
- Discrete distributions:

1- Uniform:

X~U^{d}(a, b), a ≤ b

p(x) = $\frac{1}{n}$

E(x) = $\frac{a+b}{2}$

Var(x) = $\frac{n^2-1}{12}$

$M_x(t) = \frac{e^{at}-e^{(b+1)t}}{n(1-e^t)}$

Ex: A die is tossed.

2- Binomial :

X~B(n, p), x = 0, 1, ...

p(x) = $\binom{n}{x}p^x(1-p)^{n-x}$

E(x) = np

Var(x) = $np(1-p)$

$M_x(t) = (pe^t + 1 - p)^n$

x: number of successes in n trials.