I

X = random variable describing execution time

$\text{exptime}(n) = E[X] = \sum_i x_i \cdot p_i$

x_i = nb. of execution steps of the algorithm

p_i = probability that the number of executed steps in the algorithm is x_i

In case of deterministic algorithms, p_i = the probability of receiving an input such that the number of executed steps is x_i

II

For the seminar, we will also need the concept of indicator random variable.

Let X be a random indicator variable. $X = \begin{cases} 1, \text{ with prob } p \\ 0, \text{ with prob } 1-p \end{cases}$

III

Reminder:

1) $E[x+y] = E[x] + E[y]$

More general: $E[\sum_i x_i] = \sum_i E[x_i]$

2) $E[a \cdot X] = a \cdot E[x]$, $a \in R$ (a is a constant)

3) $E[x \cdot y] = E[x] \cdot E[y]$ iff x & y are independent

$E[x] = 1 \cdot p + 0 \cdot (1-p) = p$ iff X is an indicator variable