1. An **experiment** is any process or action whose outcome is not known (is *random*).
2. A **sample space**, denoted by S, is the set of all possible outcomes of an experiment; composed of elementary events (denoted by $\mathbf{e_i}$)
3. An **event** is a collection of elementary events (also a subset of S); denoted by capital letters
    a. Impossible event, sure event
4. **Symmetric difference** of 2 events: $A \Delta B = (A \setminus B) \cup (B \setminus A) = (A \cup B) \setminus (A \cap B)$
    a. Only one of A or B can occur
5. Three or more events are mutually exclusive if any two of them are
6. A collection of events from S is said to be a **partition** of S if the events are **collectively exhaustive** (their union is S) and **mutually exclusive**
7. A, B - ind events => A, !B and !A, B and !A, !B - are all ind (l2, p5)
8. **Bernoulli trials** - independent; outcomes = success or failure; probability of success is the same for each trial
9. In the **Pascal model** there are, theoretically, an infinite number of trials
10. A Poisson random variable (Poisson distribution) does **not** come from the Poisson model
11. The parameter $\boldsymbol{\lambda}$ of a Poisson distribution represents the average number of occurrences of the event in that interval of time
12. The discrete events that are counted in a Poisson process are also called "rare events"
13. The sum of n independent **Bern**(p) (Bernoulli) random variables is a **B**(n; p) (binomial) variable
14. The sum of n independent **Geo**(p) (geometric) random variables is a **NB**(n; p) (Pascal) variable
15. PDF = .. *distribution* .. in the discrete case; .. *density* .. in the continuous case
16. To obtain the joint PDF from the joint CDF (continuous case), partially differentiate twice, once wrt x, then y
17. If $X < Y \Leftrightarrow$ every value from X is smaller than its correspondent in Y => $E(X) < E(Y)$
18. $X \sim Bino(n, p) \Rightarrow E(X) = np; V(X) = np(1 - p)$
19. $X \sim Norm(\mu, \boldsymbol{\sigma}) \Rightarrow E(X) = \mu; V(X) = \boldsymbol{\sigma^2}$
20. a quantile is a number with the property that it exceeds at most $100*\boldsymbol{\alpha}\%$ of the data, and is exceeded by at most $100*(1 - \boldsymbol{\alpha})\%$ of the data
21. **Median** = quantile with $\boldsymbol{\alpha} = 0.5$
22. iid = independent and identically distributed

23. There’s more than 1 central limit theorem (CLT), we are working with one version of it
24. If n is large enough (usually n > 30) => we can apply the CLT (see l7, p11)
25. A numerical characteristic is called a **parameter**, if it refers to an entire population and a **statistic**, if it refers just to a sample
26. A - B (set difference) = A ∩ !B
27. P(!A | B) = 1 - P(A | B)
28. The efficiency of an estimator can only be computed if the estimator is absolutely correct
29. If an estimator is efficient => it’s a MVUE