

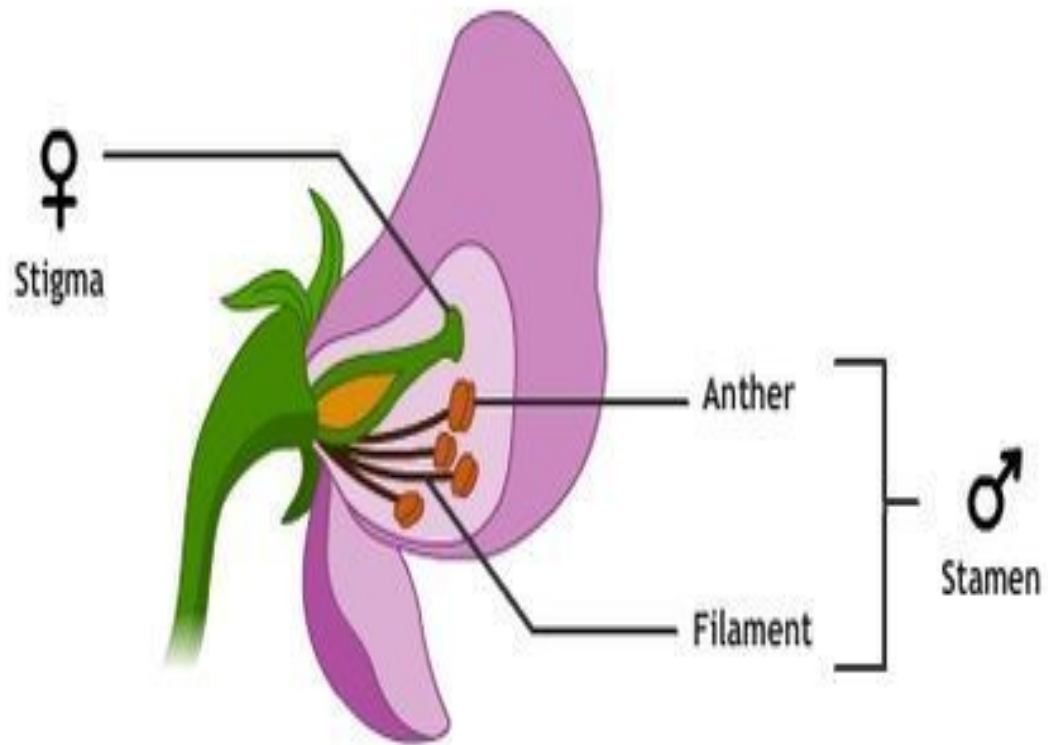
# Chapter 11.1: The work of Gregor Mendel



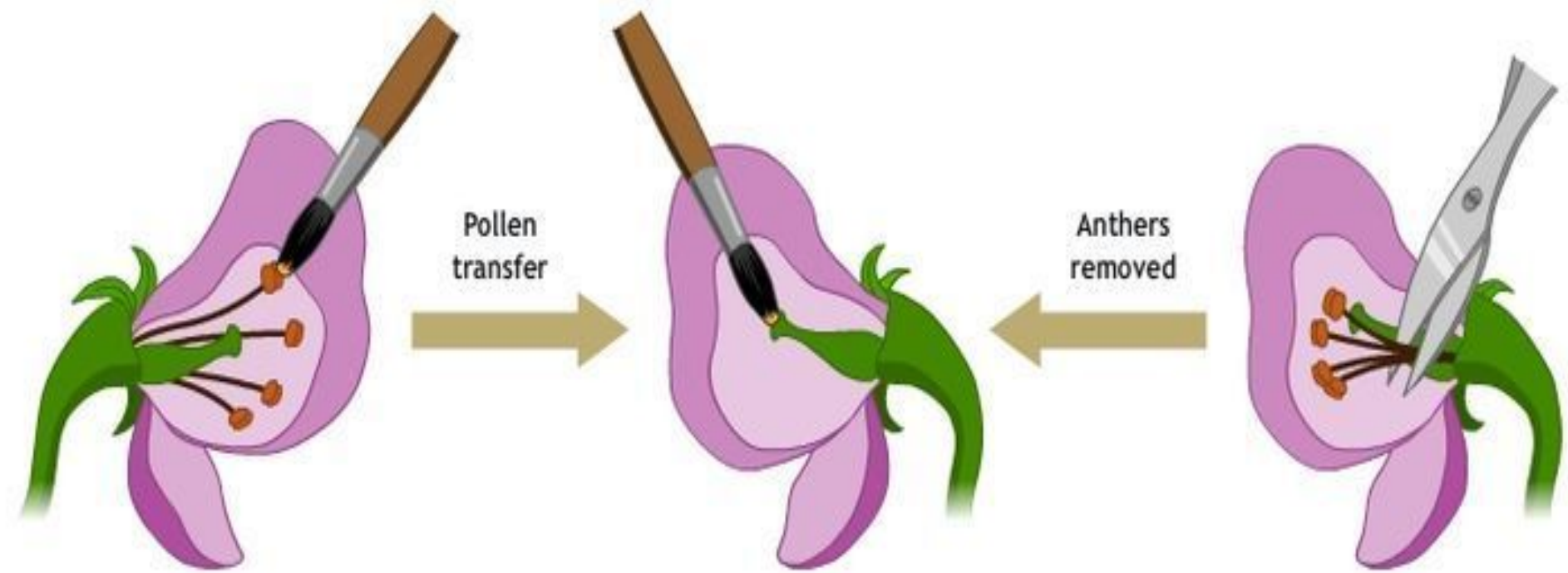
GREGOR MENDEL

**Gregor Mendel (1822-1884):**

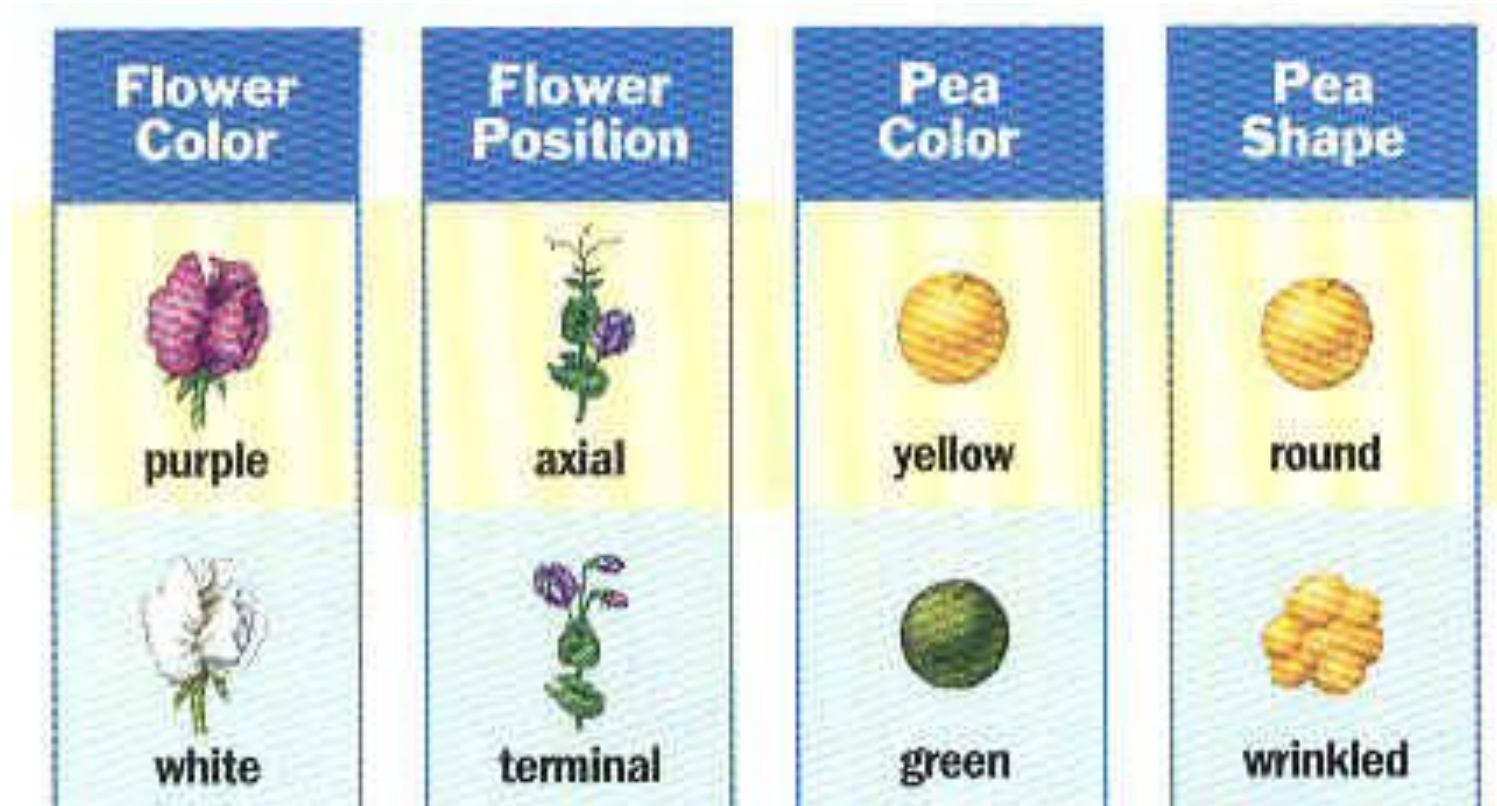
an Austrian monk who studied heredity in plants. The father of modern genetics!



**Fertilization**: during sexual reproduction, male and female reproductive cells join to form a new individual.

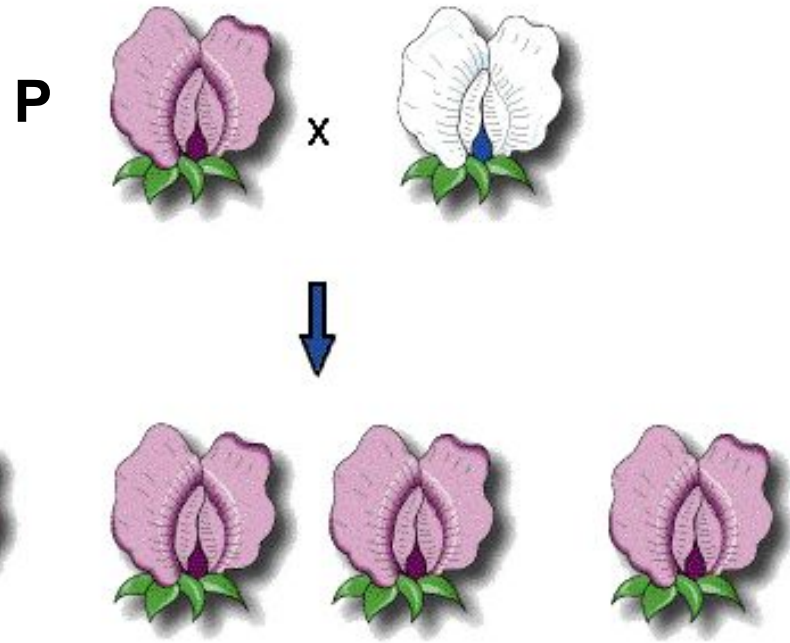


**Trait**: a specific characteristic that varies from one individual to another.



## Mendel's first conclusion:

1. biological inheritance is determined by factors (*genes*) that are passed from parents to offspring.



**Genes**: heritable traits

**Alleles**: different forms of a gene,  
(*typically represented as a letter*)

Blossom color  
B= purple allele  
b= white allele

## Mendel's 2nd conclusion:

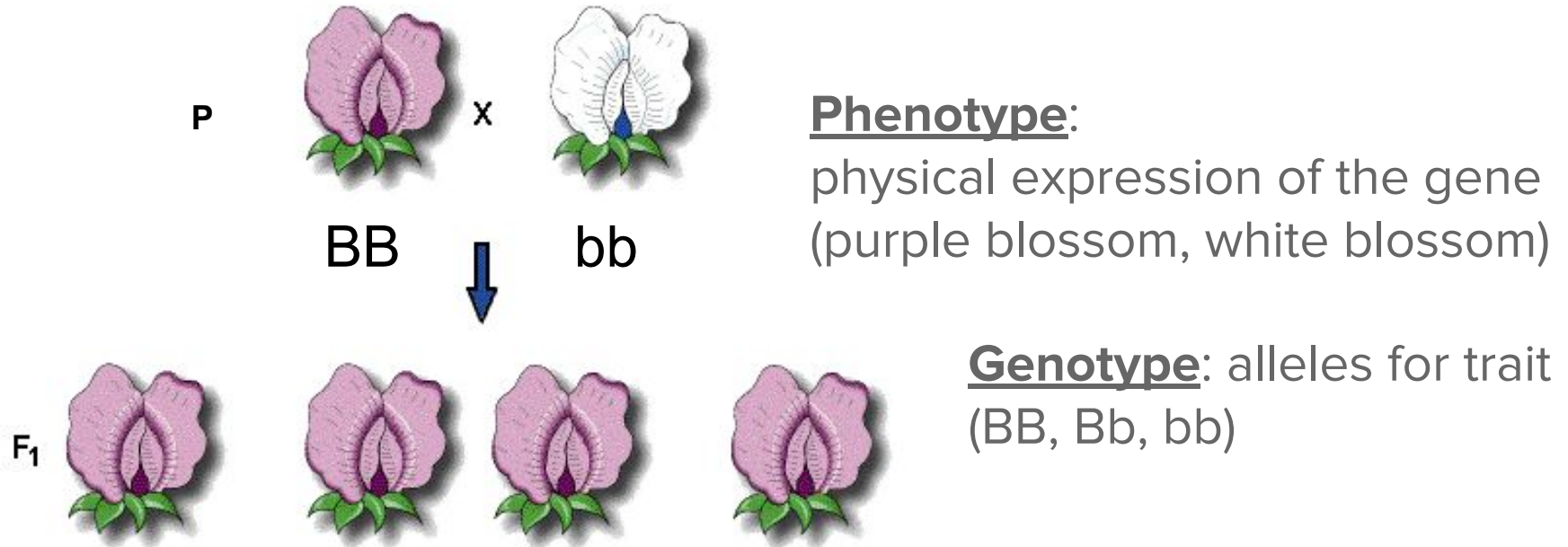
### The principle of dominance:

- some alleles are dominant and others are recessive.
- Dominant alleles will be expressed over recessive alleles.
- Recessive alleles will only show if no dominant allele is present.

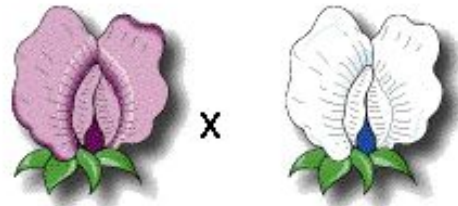


**B= Purple Allele ; b= White Allele**

**Hybrids**: offspring crosses between parents with different traits



*When only dominant alleles are expressed in the offspring, do all the recessive alleles disappear?*

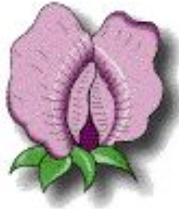


BB

bb



F<sub>1</sub>



Bb

Bb

Bb

Bb

***If Mendel were to cross two flowers of the F<sub>1</sub> generation, would any of the next F<sub>2</sub> generation show the recessive trait? (white blossoms)***



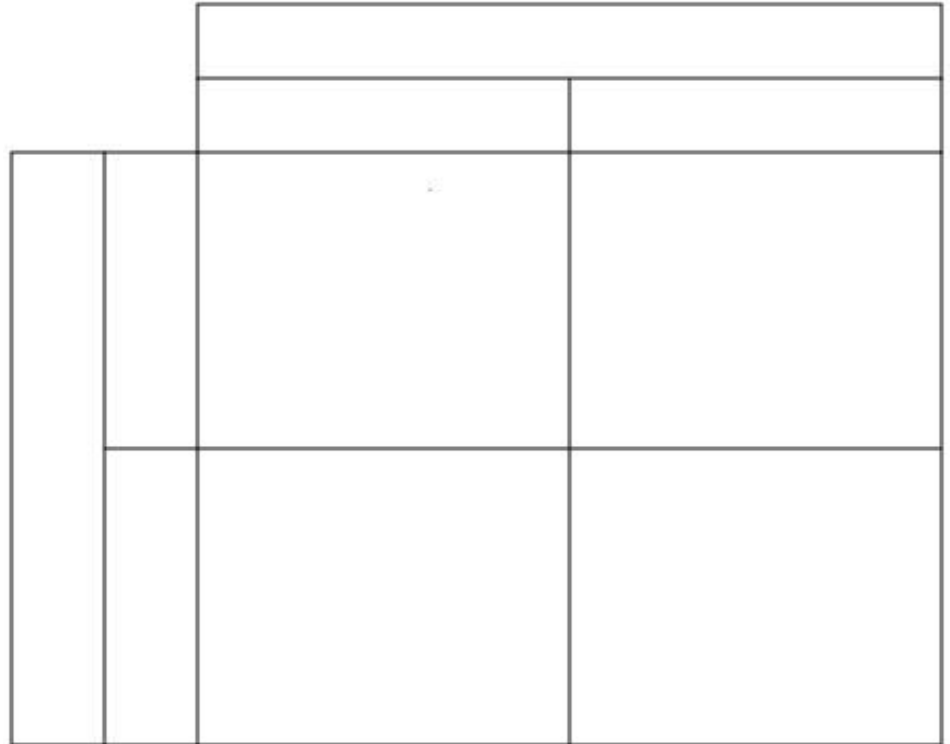
**Punnett square**: a diagram used to predict and compare the genetic variations that will result from a cross.

SPERM 

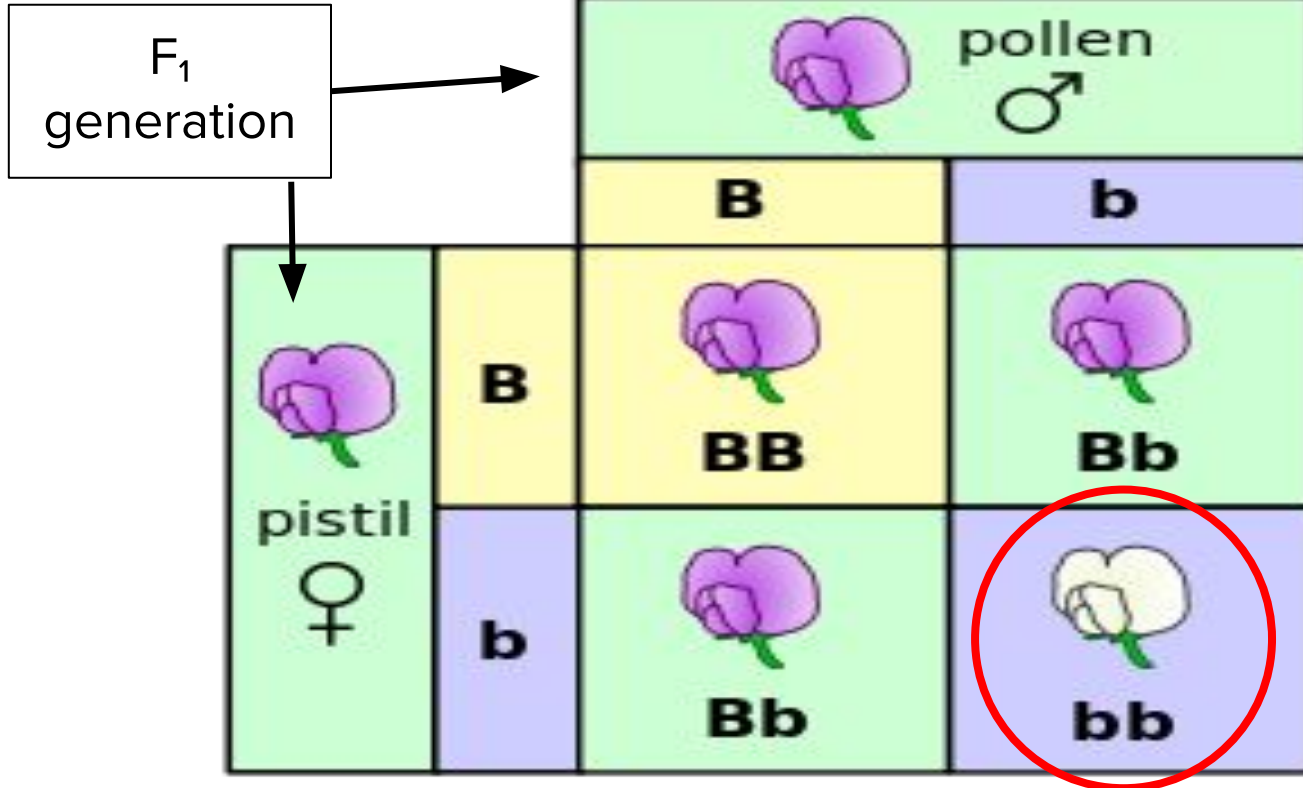


Reginald Crundall Punnett

EGGS



Roughly a quarter of the F<sub>2</sub> generation showed recessive traits!



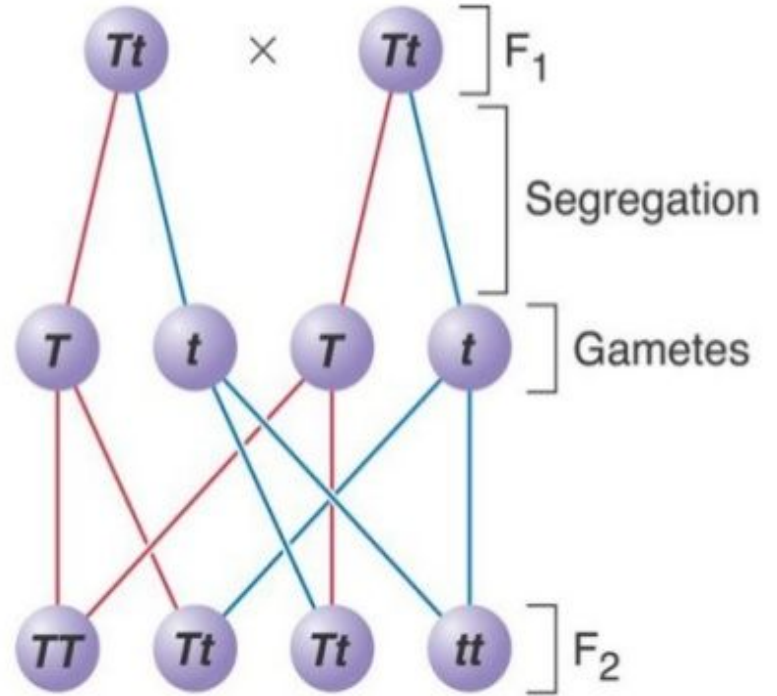
**The principle of segregation:**

alleles separate during the formation of reproductive cells.

**Principle of independent assortment:**

genes for different traits can recombine to make new genetic variations.

Alleles separate during gamete formation.



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