Combinations and Permutations

**Generate all combinations/permutations:**

Combinations w/o replacement: itertools.combinations(iterable, length)

Combinations with replacement: itertools.combinations\_with\_replacement(iterable, length)

Permutations w/o replacement: itertools.permutations(iterable, length (optional))

Permutations with replacement: itertools.product(iterable, repeat = <desired length>)

**Cartesian product:**

itertools.product(\*iterables, repeat=1) – the set of all ordered pairs (x, y, …) such that x belongs to the first iterable, y belongs to the second iterable, etc. Repeat allows you to compute the product of an iterable with itself easily.