



# Subset Space

## 1 Why

We speak of a set and a set of its subsets satisfying properties.

## 2 Definition

A **subset space** is a pair of sets: the second contains subsets of the first.

We call the first set the **base set**. If the base set is finite, we call the subset space a **finite subset space**. A **distinguished subset** is an element of the second set. An **undistinguished subset** is a subset of the first set which is not distinguished.

Useful subset spaces are those for which the distinguished subsets satisfy some set-algebraic properties. For one example, the distinguished sets may be closed under set union or set intersection. As another example, the distinguished sets may be closed under complements or under subsets.

## 2.1 Notation

Let  $A$  be a set and  $\mathcal{A} \subset 2^A$ . We denote the subset space of  $A$  and  $\mathcal{A}$  by  $(A, \mathcal{A})$ , read aloud as “A, script A.”