Subset Algebra

1 Why

We often talk about a set and a set of its subsets satisfying properties.

2 Definition

A **subset algbera** is two sets: the second is a set of subsets of the first.

We call the first set the **base set**. If the base set is finite, we speak of a **finite subset algebra**. We call an element of the second set a **distinguished subset**. A subset is an **undistingished subset** if it is not distinguished.

Useful subset algebras 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 a second example, the distinguished sets may include the base set. As a third example, the distinguished sets may be closed under complements or under subsets.

2.1 Notation

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