1. Preface

This article is intended to collect in one document the known properties of filters on posets (and some generalizations thereof, namely "filtrators" defined below).

It seems that until now were published no reference on the theory of filters. This text is to fill the gap.

This text will also serve as the reference base for my further articles. This text provides a definitive place to refer as to the collection of theorems about filters.

Detailed study of filters is required for my ongoing research which will be published as "Algebraic General Topology" series.

In place of studying filters in this article are instead researched what the author calls "filter objects". Filter objects are basically the lattice of filters ordered reverse to set inclusion, with principal filters equated with the poset element which generates them. (See below for formal definition of "filter objects".)

Although our primary interest are properties of filters on a set, in this work are instead researched the more general theory of "filtrators" (see below).

This article also contains some original research:

- filtrators;
- straight maps and separation subsets;
- other minor results, such as the theory of free stars.

2. Notation and basic results

We denote $\mathcal{P}S$ the set of all subsets of a set S.

$\langle f \rangle X \overset{\text{def}}{=} \{ fx \mid x \in X \}$ for any set X and function f.