

$$\begin{aligned}
 \{a, c\} \cup \{a, b, c\} &= \{a, b, c\} \\
 \{a, c\} \cup \{a, c, d\} &= \{a, c, d\} \\
 \{a, c\} \cup \{a, b, c, d\} &= \{a, b, c, d\} \\
 \{a, b, c\} \cup \{a, c, d\} &= \{a, b, c, d\} \\
 \{a, b, c\} \cup \{a, b, c, d\} &= \{a, b, c, d\} \\
 \{a, c, d\} \cup \{a, b, c, d\} &= \{a, b, c, d\} \\
 \{a, c\} \cap \{a, b, c\} &= \{a, c\} \\
 \{a, c\} \cap \{a, c, d\} &= \{a, c\} \\
 \{a, c\} \cap \{a, b, c, d\} &= \{a, c\} \\
 \{a, b, c\} \cap \{a, c, d\} &= \{a, c\} \\
 \{a, b, c\} \cap \{a, b, c, d\} &= \{a, b, c\} \\
 \{a, c, d\} \cap \{a, b, c, d\} &= \{a, c, d\}
 \end{aligned}$$

OPEN

- $\{a\}, \{a, b\}, \{a, b, c\}, \{a, b, c, d\}$
Not a topology on S
Does not include $\emptyset$

3.3 -

$$\begin{aligned}
 \{a, b, c\} \cap \emptyset &= \emptyset \\
 \{a, b, c\} \cap \{a\} &= \{a\} \\
 \{a, b, c\} \cap \{a, b\} &= \{a, b\} \\
 \{a, b, c\} \cap \{a, b, c, d\} &= \{a, b, c\}
 \end{aligned}$$

$$\rightarrow \boxed{\emptyset, \{a\}, \{a, b\}, \{a, b, c\}}$$

-
$$\begin{aligned}
 \{a, b, c\} \cap \emptyset &= \emptyset \\
 \{a, b, c\} \cap \{a, c\} &= \{a, c\} \\
 \{a, b, c\} \cap \{a, b, c\} &= \{a, b, c\} \\
 \{a, b, c\} \cap \{a, c, d\} &= \{a, c\} \\
 \{a, b, c\} \cap \{a, b, c, d\} &= \{a, b, c\}
 \end{aligned}$$

$$\rightarrow \boxed{\emptyset, \{a, c\}, \{a, b, c\}}$$