

Countable set question

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Hello everyone, I am preparing for a final and would like some help.

Suppose:

$A_0 \supseteq A_1 \supseteq A_2 \supseteq \dots \supseteq A_\alpha \supseteq \dots$ ($\alpha < \omega_1$) is a sequence of disjoint sets. ($A \supseteq B$ reads as "B is a subset of A").

How does one prove or disprove that there must be an $\alpha < \omega_1$ with A_α a countable set?

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