Show that the choice axiom is equivalent to the statement that for any indexed family $\{A_\alpha\}_{\alpha \in J}$ of nonempty sets with $J \neq 0$ the cartesian product $\prod_{\alpha \in J} A_\alpha$ is not empty

let $\{A_\alpha\}_{\alpha \in J}$ be a family of disjoint nonempty sets. Then $\prod_{\alpha \in J} A_\alpha$ is not empty that is $\exists$ $X : J \to \bigcup_{\alpha \in J} A_\alpha$ s.t $X(\alpha) \in A_\alpha$ but $X(\alpha) \notin A_{\tilde{\alpha}}$, $\tilde{\alpha} \neq \alpha$. Then $C = \bigcup_{\alpha \in J} X(\alpha)$.

The other direction is clear since it gives us an element in each set.