X1) Given a single-attribute relation, R there is no way to reduce the number of tuples (to a non-zero amount) without the selection operation. So the selection operation is necessary.

- Projection reduces columns not tuples
- Cross product increases columns and tuples
- Union increases number of tuples.
- Difference could decrease the number of tuples in R if we had some other set SCR but as there is no SCR and no other operator to reduce tuples in R there is no way to create a set S. We can solve R-R to get an empty set but there is no way to reduce tuples to be greater than zero and less than the number of tuples in R. □