Relational Algebra operators

1. *The select operator, σ*
   - Pick rows satisfying a given condition, $\sigma_{condition}$ (Relational expression)
   - Example: $\sigma_{gpa > 3.5}$ Students
   - Output a subset of the Students relation containing only rows/students with gpa bigger than 3.5

2. *The project operator, π*
   - Pick the specified columns, $\pi_{A1, A2, ..., An}$ (Relational expression)
   - Example: $\pi_{sId, sName}$ Students
   - Output the entire Students table but lists only the sId and sName columns

3. *Cross-product or Cartessian product, T1* × T2
   - Combine two tables or table expressions
   - Output is a new relation whose schema is the union of the schemas of operand tables or expressions and contents consist of every possible row combinations
   - A binary operator but can compose

4. *Natural Join*
   - Like the cross product but ensures that the result consists of only row combinations in which similarly-named column values are equal and only one of those columns is retained
   - Does not add expressive power to RA, as every natural join expression has an equivalent cross product expression. But it's notationally convenient

5. *Theta Join*
   - Like cross product but output consists of only tuples satisfying the theta predicate
   - Does not add more expressive power to RA, but it's the basic operation implemented by most RDBMS
   - Think of "join" as theta join