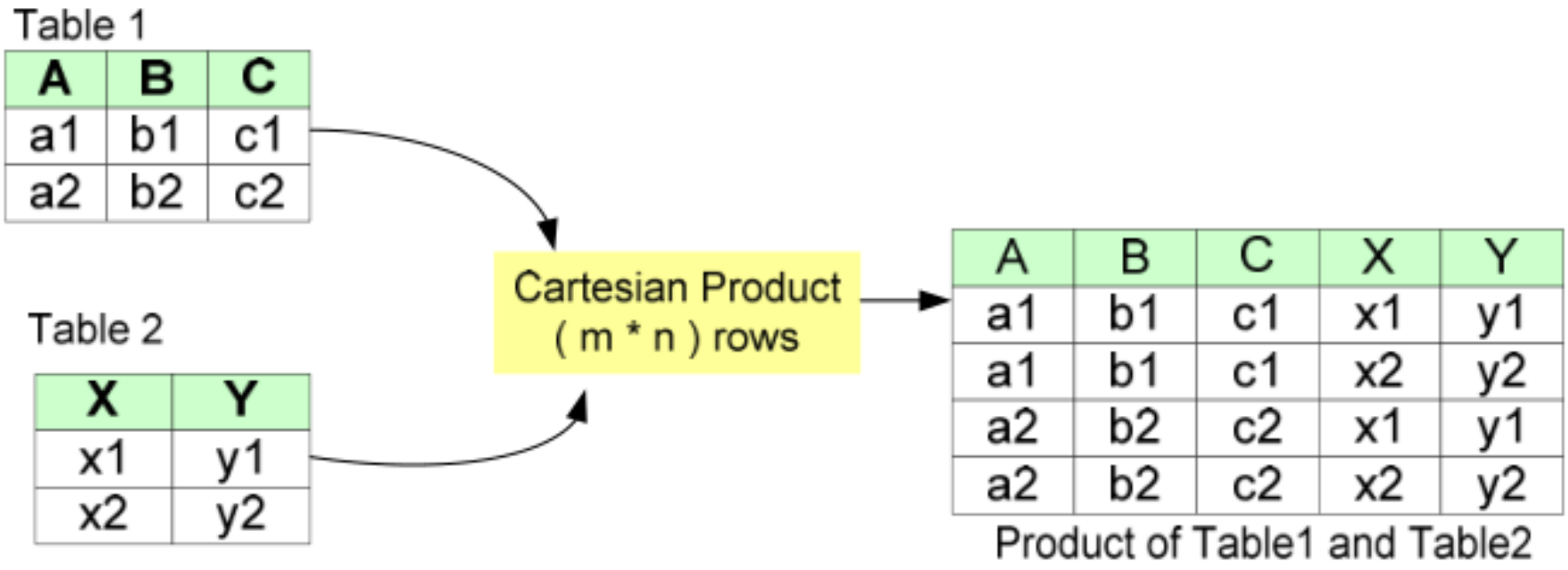
Joined Relations

- **Join operations** take two relations and return as a result another relation.
- A join operation is a Cartesian product which requires that tuples in the two relations match (under some condition). It also specifies the attributes that are present in the result of the join
- The join operations are typically used as subquery expressions in the **from** clause

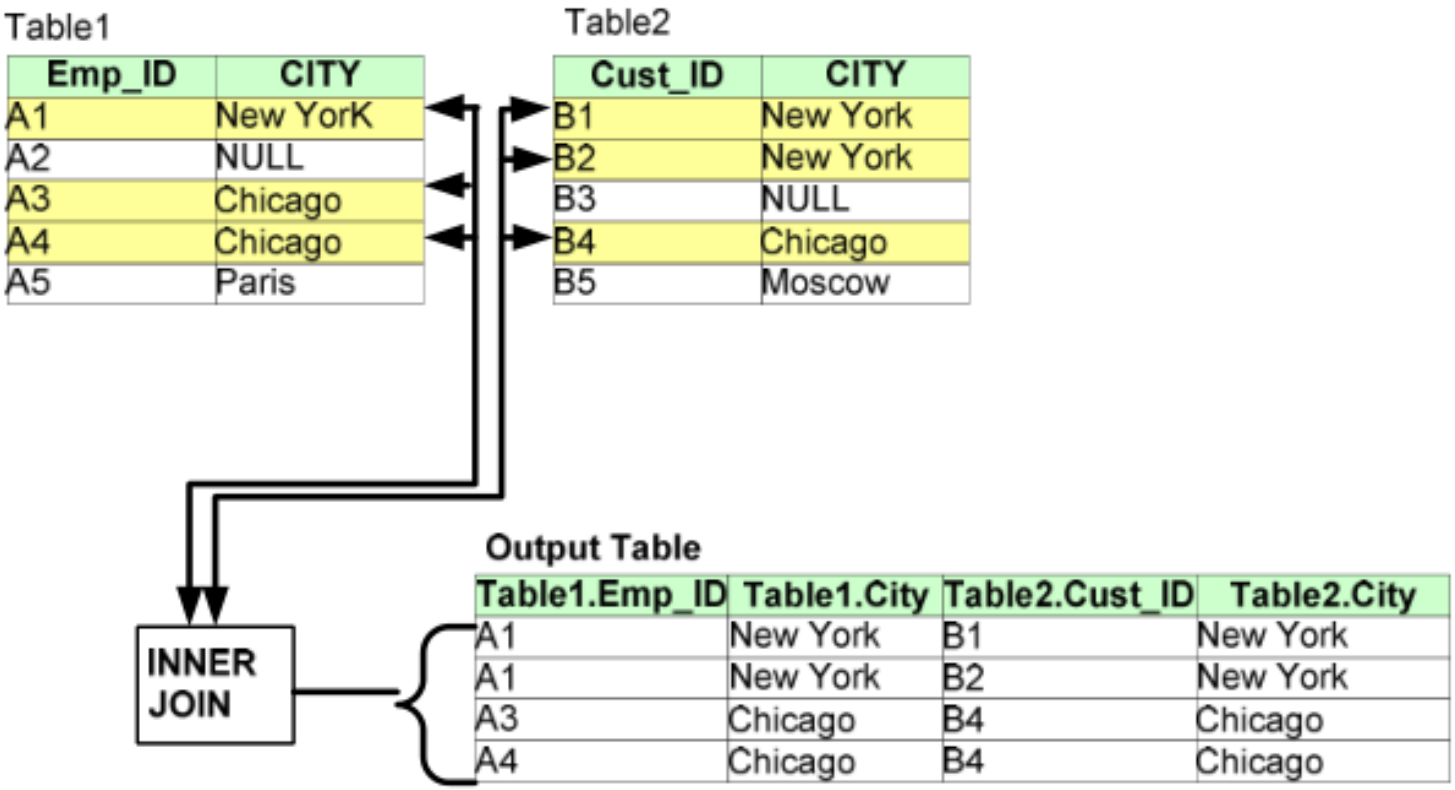
Cartesian Product / Cross Join

SELECT * FROM Table1, Table2



Inner Join

SELECT Table1.Emp_ID, Table1.City, Table2.Cust_ID, Table2.City
FROM Table1 **INNER JOIN** Table2 **ON** Table1.City = Table2.City;

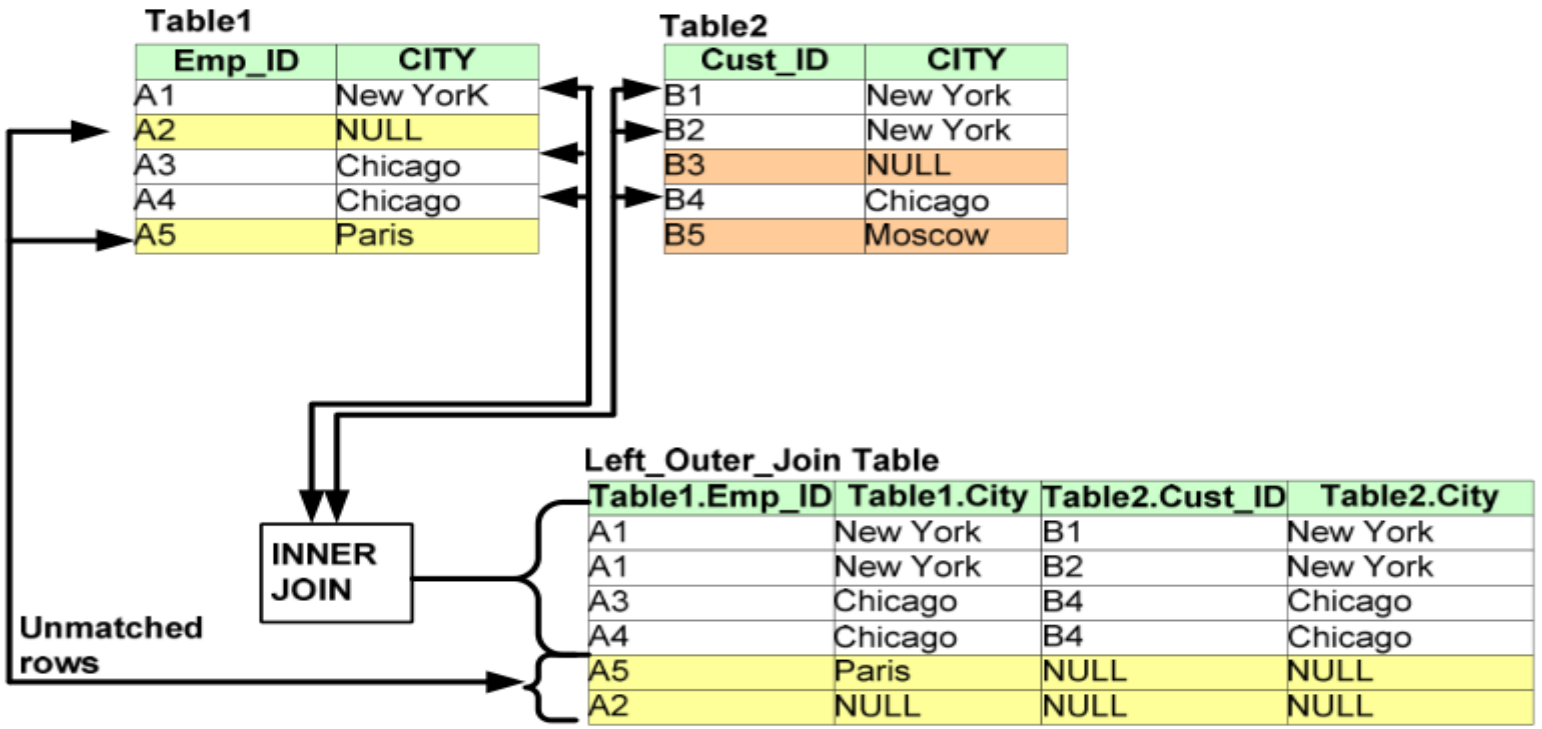


Left Outer Join

SELECT Table1.Emp_ID, Table1.City, Table2.Cust_ID, Table2.City

FROM Table1 **LEFT OUTER JOIN** Table2 **ON** Table1.City = Table2.City;

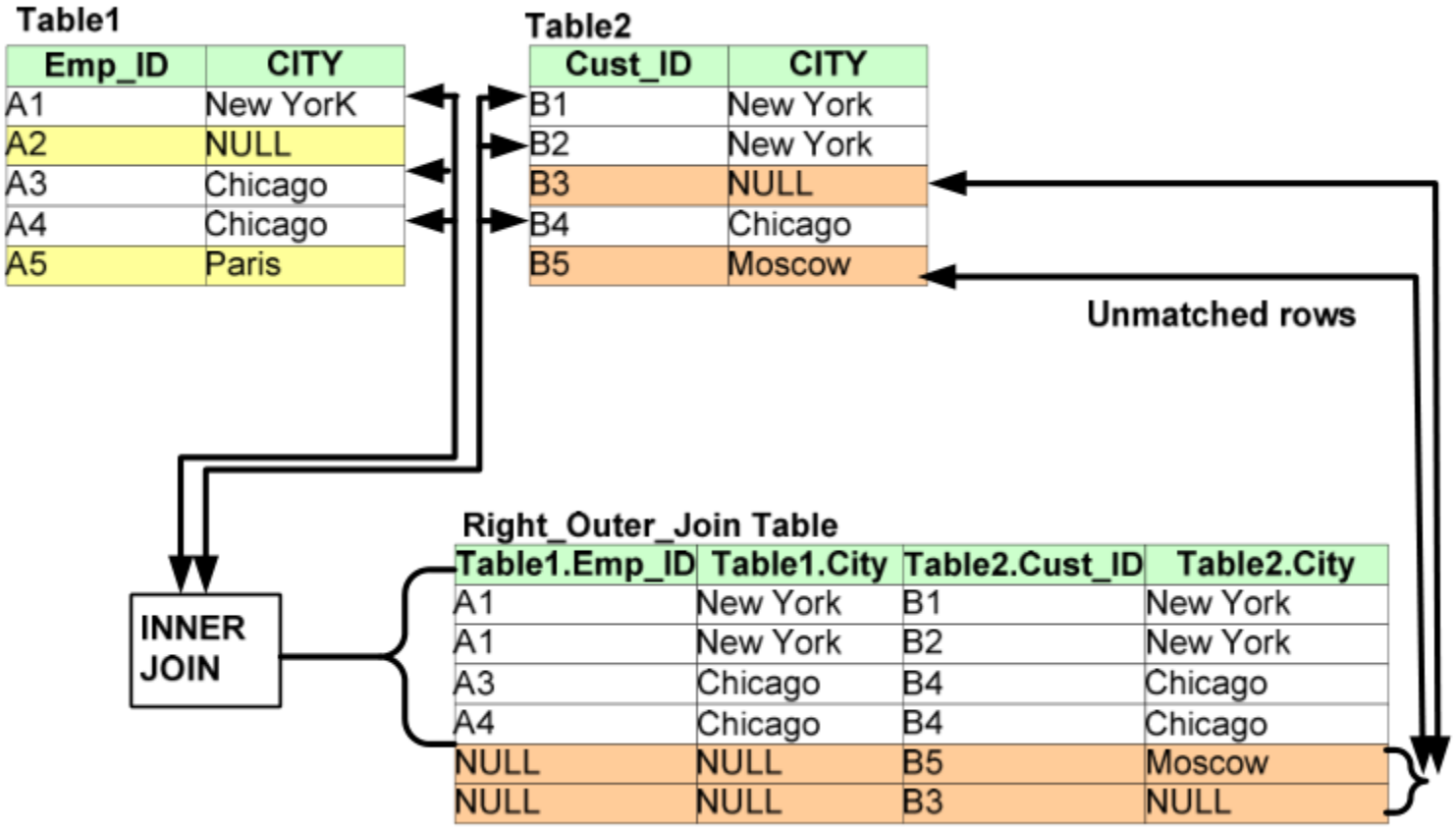
- Begin with the INNER JOIN of the two tables, using matching columns
- For each row of the left table that is not matched by any row in the right table, add one row to the query results, using the values of the columns in the left table, and assuming a NULL value for all columns of the right table



Right Outer Join

SELECT Table1.Emp_ID, Table1.City, Table2.Cust_ID, Table2.City

FROM Table1 **RIGHT OUTER JOIN** Table2 **ON** Table1.City = Table2.City;



Full Outer Join

SELECT Table1.Emp_ID, Table1.City, Table2.Cust_ID, Table2.City

FROM Table1 **OUTER JOIN** Table2 **ON** Table1.City = Table2.City;