Cartesian Product

Sony P

MEC

Cartesian Product (x)

Student

Sname	RollNo	Dept
Abraham	CSU19A02	CSE
Aleena	CSU19B06	CSE
Jithin	ECU18B07	ECE
Asha	EEE17A02	EEE

Department

Dname	Did
Computer Science	CSE
Electronics	ECE
Electrical	EEE

Student x Department

Sname	Roll No	Dept	Dname	Did
Abraham	CSU19A02	CSE	Computer Science	CSE
Abraham	CSU19A02	CSE	Electronics	ECE
Abraham	CSU19A02	CSE	Electrical	EEE
Aleena	CSU19B06	CSE	Computer Science	CSE
Aleena	CSU19B06	CSE	Electronics	ECE
Aleena	CSU19B06	CSE	Electrical	EEE
Jithin	ECU18B07	ECE	Computer Science	CSE
Jithin	ECU18B07	ECE	Electronics	ECE
Jithin	ECU18B07	ECE	Electrical	EEE
Asha	EEE17A02	EEE	Computer Science	CSE
Asha	EEE17A02	EEE	Electronics	ECE
Asha	EEE17A02	EEE	Electrical	EEE

CARTESIAN (or CROSS) PRODUCT Operation

- This operation is used to combine tuples from two relations in a combinatorial fashion.
- Denoted by R(A1, A2, . . ., An) x S(B1, B2, . . ., Bm)
- Result is a relation Q with degree n + m attributes:
- Q(A1, A2, . . ., An, B1, B2, . . ., Bm), in that order.
- The resulting relation state has one tuple for each combination of tuples—one from R and one from S.
- Hence, if R has nR tuples (denoted as |R| = nR), and S has nS tuples, then R x S will have nR * nS tuples.
- The two operands do NOT have to be "type compatible”

Q. Find the name of students who are studying in computer science department

Department

Student

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Student x Department

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Jithin	ECU18B07	ECE	Electronics	ECE
Jithin	ECU18B07	ECE	Electrical	EEE
Asha	EEE17A02	EEE	Computer Science	CSE
Asha	EEE17A02	EEE	Electronics	ECE
Asha	EEE17A02	EEE	Electrical	EEE

$\sigma_{student.Dept=Department.Did}$(Student x Department)

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Jithin	ECU18B07	ECE	Electronics	ECE
Asha	EEE17A02	EEE	Electrical	EEE

$\sigma_{Dname="Computer\ science"}(\sigma_{student.Dept=Department.Did}(Student \times Department))$

Sname	Roll No	Dept	Dname	Did
Abraham	CSU19A02	CSE	Computer Science	CSE
Aleena	CSU19B06	CSE	Computer Science	CSE

$$\Pi_{sname}\ (\sigma_{Dname="Computer\ science"}(\sigma_{student.Dept=Department.Did}(Student \times Department)))$$

Sname
Abraham
Aleena

$$\Pi_{sname}(\sigma_{Dname="Computer\ science"}(\sigma_{student.Dept=Department.Did}(Student \times Department)))$$