**Example**

**Table 1**- **STUDENT**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ROLL\_NO** | **NAME** | **ADDRESS** | **PHONE** | **AGE** |
| 1 | RAM | DELHI | 9455123451 | 18 |
| 2 | RAMESH | GURGAON | 9652431543 | 18 |
| 3 | SUJIT | ROHTAK | 9156253131 | 20 |
| 4 | SURESH | DELHI | 9156768971 | 18 |

**Table 2**- **STUDENT\_SPORTS**

|  |  |
| --- | --- |
| **ROLL\_NO** | **SPORTS** |
| 1 | Badminton |
| 2 | Cricket |
| 2 | Badminton |
| 4 | Badminton |

**Table 3**- **ALL\_SPORTS**

|  |
| --- |
| **SPORTS** |
| Badminton |
| Cricket |

**Table 4 EMPLOYEE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **EMP\_NO** | **NAME** | **ADDRESS** | **PHONE** | **AGE** |
| 1 | RAM | DELHI | 9455123451 | 18 |
| 5 | NARESH | HISAR | 9782918192 | 22 |
| 6 | SWETA | RANCHI | 9852617621 | 21 |
| 4 | SURESH | DELHI | 9156768971 | 18 |

**Conditional Join(⋈c)**

Conditional Join is used when you want to join two or more relation based on some conditions.

**Example:**

Select students whose ROLL\_NO is greater than EMP\_NO of employees

**STUDENT*⋈c*STUDENT.ROLL\_NO>EMPLOYEE.EMP\_NOEMPLOYEE**

In terms of basic operators (cross product and selection):

**σ (STUDENT.ROLL\_NO>EMPLOYEE.EMP\_NO)(STUDENT×EMPLOYEE)**

**Result:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ROLL\_NO** | **NAME** | **ADDRESS** | **PHONE** | **AGE** | **EMP\_NO** | **NAME** | **ADDRESS** | **PHONE** | **AGE** |
| 2 | RAMESH | GURGAON | 9652431543 | 18 | 1 | RAM | DELHI | 9455123451 | 18 |
| 3 | SUJIT | ROHTAK | 9156253131 | 20 | 1 | RAM | DELHI | 9455123451 | 18 |
| 4 | SURESH | DELHI | 9156768971 | 18 | 1 | RAM | DELHI | 9455123451 | 18 |

**Example:**

**R S**

**(ID Sex Marks) (ID Sex Marks)**

**----------------------- ----------------------**

1 F 45 10 M 20

2 F 55 11 M 22

3 F 60 12 M 59

Join between R And S with condition **R.marks >= S.marks**

R.ID R.Sex R.Marks S.ID S.Sex S.Marks

-------------------------------------------------------------

1 F 45 10 M 20

1 F 45 11 M 22

2 F 55 10 M 20

2 F 55 11 M 22

3 F 60 10 M 20

3 F 60 11 M 22

3 F 60 12 M 59

**Equi Join (⋈)**

**Example:**

Select students whose ROLL\_NO is equal to EMP\_NO of employees

STUDENT⋈STUDENT.ROLL\_NO=EMPLOYEE.EMP\_NOEMPLOYEE

In terms of basic operators (cross product, selection and projection):

∏(STUDENT.ROLL\_NO, STUDENT.NAME, STUDENT.ADDRESS, STUDENT.PHONE, STUDENT.AGE, EMPLOYEE.NAME,EMPLOYEE.ADDRESS,EMPLOYEE.PHONE,EMPLOYEE.AGE)(σ(STUDENT.ROLL\_NO=EMPLOYEE.EMP\_NO) (STUDENT×EMPLOYEE))

**Result:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ROLL\_NO** | **NAME** | **ADDRESS** | **PHONE** | **AGE** | **NAME** | **ADDRESS** | **PHONE** | **AGE** |
| 1 | RAM | DELHI | 9455123451 | 18 | RAM | DELHI | 9455123451 | 18 |
| 4 | SURESH | DELHI | 9156768971 | 18 | SURESH | DELHI | 9156768971 | 18 |
|  |  |  |  |  |  |  |  |  |

**Natural Join (⋈)**

**Example:**

Select students whose ROLL\_NO is equal to ROLL\_NO of STUDENT\_SPORTS as:

STUDENT⋈STUDENT\_SPORTS

In terms of basic operators (cross product, selection and projection):

∏(STUDENT.ROLL\_NO, STUDENT.NAME, STUDENT.ADDRESS, STUDENT.PHONE, STUDENT.AGE STUDENT\_SPORTS.SPORTS)(σ(STUDENT.ROLL\_NO=STUDENT\_SPORTS.ROLL\_NO) (STUDENT×STUDENT\_SPORTS))

**Result:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ROLL\_NO** | **NAME** | **ADDRESS** | **PHONE** | **AGE** | **SPORTS** |
| 1 | RAM | DELHI | 9455123451 | 18 | Badminton |
| 2 | RAMESH | GURGAON | 9652431543 | 18 | Cricket |
| 2 | RAMESH | GURGAON | 9652431543 | 18 | Badminton |
| 4 | SURESH | DELHI | 9156768971 | 18 | Badminton |

Natural Join is by default inner join because the tuples which does not satisfy the conditions of join does not appear in result set. e.g.; The tuple having ROLL\_NO 3 in STUDENT does not match with any tuple in STUDENT\_SPORTS, so it has not been a part of result set.

**Left Outer Join (⟕)**

**Example:**

Select students whose ROLL\_NO is greater than EMP\_NO of employees and details of other students as well

STUDENT⟕STUDENT.ROLL\_NO>EMPLOYEE.EMP\_NOEMPLOYEE

**Result**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ROLL\_NO** | **NAME** | **ADDRESS** | **PHONE** | **AGE** | **EMP\_NO** | **NAME** | **ADDRESS** | **PHONE** | **AGE** |
| 2 | RAMESH | GURGAON | 9652431543 | 18 | 1 | RAM | DELHI | 9455123451 | 18 |
| 3 | SUJIT | ROHTAK | 9156253131 | 20 | 1 | RAM | DELHI | 9455123451 | 18 |
| 4 | SURESH | DELHI | 9156768971 | 18 | 1 | RAM | DELHI | 9455123451 | 18 |
| 1 | RAM | DELHI | 9455123451 | 18 | NULL | NULL | NULL | NULL | NULL |

**Right Outer Join (⟖)**

**Example:**

Select students whose ROLL\_NO is greater than EMP\_NO of employees and details of other Employees as well

STUDENT⟖STUDENT.ROLL\_NO>EMPLOYEE.EMP\_NOEMPLOYEE

**Result:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ROLL\_NO** | **NAME** | **ADDRESS** | **PHONE** | **AGE** | **EMP\_NO** | **NAME** | **ADDRESS** | **PHONE** | **AGE** |
| 2 | RAMESH | GURGAON | 9652431543 | 18 | 1 | RAM | DELHI | 9455123451 | 18 |
| 3 | SUJIT | ROHTAK | 9156253131 | 20 | 1 | RAM | DELHI | 9455123451 | 18 |
| 4 | SURESH | DELHI | 9156768971 | 18 | 1 | RAM | DELHI | 9455123451 | 18 |
| NULL | NULL | NULL | NULL | NULL | 5 | NARESH | HISAR | 9782918192 | 22 |
| NULL | NULL | NULL | NULL | NULL | 6 | SWETA | RANCHI | 9852617621 | 21 |
| NULL | NULL | NULL | NULL | NULL | 4 | SURESH | DELHI | 9156768971 | 18 |

**Full Outer Join (⟗)**

**Example:**

Select students whose ROLL\_NO is greater than EMP\_NO of employees and details of other Employees as well and other Students as well

STUDENT⟗STUDENT.ROLL\_NO>EMPLOYEE.EMP\_NOEMPLOYEE

**Result:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ROLL\_NO** | **NAME** | **ADDRESS** | **PHONE** | **AGE** | **EMP\_NO** | **NAME** | **ADDRESS** | **PHONE** | **AGE** |
| 2 | RAMESH | GURGAON | 9652431543 | 18 | 1 | RAM | DELHI | 9455123451 | 18 |
| 3 | SUJIT | ROHTAK | 9156253131 | 20 | 1 | RAM | DELHI | 9455123451 | 18 |
| 4 | SURESH | DELHI | 9156768971 | 18 | 1 | RAM | DELHI | 9455123451 | 18 |
| NULL | NULL | NULL | NULL | NULL | 5 | NARESH | HISAR | 9782918192 | 22 |
| NULL | NULL | NULL | NULL | NULL | 6 | SWETA | RANCHI | 9852617621 | 21 |
| NULL | NULL | NULL | NULL | NULL | 4 | SURESH | DELHI | 9156768971 | 18 |
| 1 | RAM | DELHI | 9455123451 | 18 | NULL | NULL | NULL | NULL | NULL |