

CSC 365

Introduction to Database Systems

- Operands in Relational Algebra are relations (or expressions that yield relations)
- A few additional derived operators are not listed: additional join types (Semijoin, Antijoin, Outer Joins) and Division

(*derived* operators are marked with *)

| Operator Name | Symbol |
|-------------------|--------------------|
| Selection | σ |
| Projection | π |
| Rename | ρ |
| Union | \cup |
| Difference | $-$ |
| Intersection * | \cap |
| Cartesian Product | \times |
| Natural Join * | \bowtie |
| Theta Join * | \bowtie_{θ} |

SUPPLIER (S)

| <u>sid</u> | sname | address |
|------------|-------|-------------|
| 1 | CP | 1 Grand Ave |
| 2 | ABC | 10 Main St |

PART (P)

| <u>pid</u> | pname | color |
|------------|-------|-------|
| 10 | D | red |
| 11 | E | blue |
| 12 | F | green |
| 13 | G | red |

CATALOG (C)

| <u>sid</u> | <u>pid</u> | cost |
|------------|------------|-------|
| 2 | 10 | 5.00 |
| 2 | 12 | 10.00 |
| 2 | 13 | 7.50 |
| 1 | 10 | 10.00 |
| 1 | 12 | 6.00 |

1. Find the names of suppliers who supply some red part.
2. Find the sids of suppliers who supply some red **or** green part.
3. Find the sids of suppliers who supply some red part **and** some green part.
4. Find the pids of parts that are supplied by at least two different suppliers.
5. Find the pids of the most expensive parts supplied by suppliers named "ABC"
6. Find the sids of suppliers who supply **every** red part.

SUPPLIER (S)

| <u>sid</u> | sname | address |
|------------|-------|-------------|
| 1 | CP | 1 Grand Ave |
| 2 | ABC | 10 Main St |

(1) Find the names of suppliers who supply some red part.

PART (P)

| <u>pid</u> | pname | color |
|------------|-------|-------|
| 10 | D | red |
| 11 | E | blue |
| 12 | F | green |
| 13 | G | red |

CATALOG (C)

| <u>sid</u> | <u>pid</u> | cost |
|------------|------------|-------|
| 2 | 10 | 5.00 |
| 2 | 12 | 10.00 |
| 2 | 13 | 7.50 |
| 1 | 10 | 10.00 |
| 1 | 12 | 6.00 |

SUPPLIER (S)

| <u>sid</u> | sname | address |
|------------|-------|-------------|
| 1 | CP | 1 Grand Ave |
| 2 | ABC | 10 Main St |

(2) Find the sids of suppliers who supply some red **or** green part.

PART (P)

| <u>pid</u> | pname | color |
|------------|-------|-------|
| 10 | D | red |
| 11 | E | blue |
| 12 | F | green |
| 13 | G | red |

CATALOG (C)

| <u>sid</u> | <u>pid</u> | cost |
|------------|------------|-------|
| 2 | 10 | 5.00 |
| 2 | 12 | 10.00 |
| 2 | 13 | 7.50 |
| 1 | 10 | 10.00 |
| 1 | 12 | 6.00 |

SUPPLIER (S)

| <u>sid</u> | sname | address |
|------------|-------|-------------|
| 1 | CP | 1 Grand Ave |
| 2 | ABC | 10 Main St |

(3) Find the sids of suppliers who supply some red part **and** some green part.

PART (P)

| <u>pid</u> | pname | color |
|------------|-------|-------|
| 10 | D | red |
| 11 | E | blue |
| 12 | F | green |
| 13 | G | red |

CATALOG (C)

| <u>sid</u> | <u>pid</u> | cost |
|------------|------------|-------|
| 2 | 10 | 5.00 |
| 2 | 12 | 10.00 |
| 2 | 13 | 7.50 |
| 1 | 10 | 10.00 |
| 1 | 12 | 6.00 |

SUPPLIER (S)

| <u>sid</u> | sname | address |
|------------|-------|-------------|
| 1 | CP | 1 Grand Ave |
| 2 | ABC | 10 Main St |

(4) Find the pids of parts that are supplied by at least two different suppliers.

PART (P)

| <u>pid</u> | pname | color |
|------------|-------|-------|
| 10 | D | red |
| 11 | E | blue |
| 12 | F | green |
| 13 | G | red |

CATALOG (C)

| <u>sid</u> | <u>pid</u> | cost |
|------------|------------|-------|
| 2 | 10 | 5.00 |
| 2 | 12 | 10.00 |
| 2 | 13 | 7.50 |
| 1 | 10 | 10.00 |
| 1 | 12 | 6.00 |

SUPPLIER (S)

| <u>sid</u> | sname | address |
|------------|-------|-------------|
| 1 | CP | 1 Grand Ave |
| 2 | ABC | 10 Main St |

(5) Find the pids of the most expensive parts supplied by suppliers named "ABC"

PART (P)

| color |
|-------|
| red |
| blue |
| green |
| red |

CATALOG (C)

| <u>sid</u> | <u>pid</u> | cost |
|------------|------------|-------|
| 2 | 10 | 5.00 |
| 2 | 12 | 10.00 |
| 2 | 13 | 7.50 |
| 1 | 10 | 10.00 |
| 1 | 12 | 6.00 |
| 2 | 11 | 10.00 |

SUPPLIER (S)

| <u>sid</u> | sname | address |
|------------|-------|-------------|
| 1 | CP | 1 Grand Ave |
| 2 | ABC | 10 Main St |

(6) Find the sides of suppliers who supply **every** red part.

PART (P)

| <u>pid</u> | pname | color |
|------------|-------|-------|
| 10 | D | red |
| 11 | E | blue |
| 12 | F | green |
| 13 | G | red |

CATALOG (C)

| <u>sid</u> | <u>pid</u> | cost |
|------------|------------|-------|
| 2 | 10 | 5.00 |
| 2 | 12 | 10.00 |
| 2 | 13 | 7.50 |
| 1 | 10 | 10.00 |
| 1 | 12 | 6.00 |

SUPPLIER (S)

| <u>sid</u> | sname | address |
|------------|-------|-------------|
| 1 | CP | 1 Grand Ave |
| 2 | ABC | 10 Main St |

PART (P)

| <u>pid</u> | pname | color |
|------------|-------|-------|
| 10 | D | red |
| 11 | E | blue |
| 12 | F | green |
| 13 | G | red |

CATALOG (C)

| <u>sid</u> | <u>pid</u> | cost |
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| 2 | 10 | 5.00 |
| 2 | 12 | 10.00 |
| 2 | 13 | 7.50 |
| 1 | 10 | 10.00 |
| 1 | 12 | 6.00 |