CS2102 ER Models & Relational Schemas
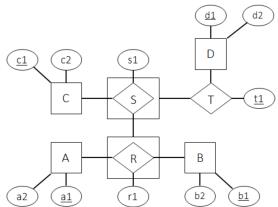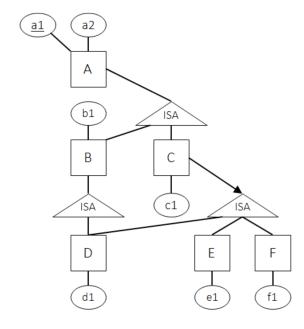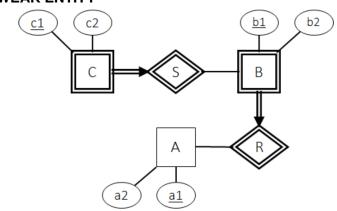
AGGREGATION


```sql
DROP TABLE IF EXISTS A, B, C, D, R, S, T CASCADE;
CREATE TABLE A (
  a1 INTEGER PRIMARY KEY,
  a2 INTEGER
);

CREATE TABLE B (
  b1 INTEGER PRIMARY KEY,
  b2 INTEGER
);

CREATE TABLE C (
  c1 INTEGER PRIMARY KEY,
  c2 INTEGER
);

CREATE TABLE D (
  d1 INTEGER PRIMARY KEY,
  d2 INTEGER
);

CREATE TABLE R (
  a1 INTEGER REFERENCES A,
  b1 INTEGER REFERENCES B,
  r1 INTEGER,
  PRIMARY KEY (a1, b1)
);

CREATE TABLE S (
  a1 INTEGER,
  b1 INTEGER,
  c1 INTEGER REFERENCES C,
  s1 INTEGER,
  PRIMARY KEY (a1, b1, c1),
  FOREIGN KEY (a1, b1) REFERENCES R
);

CREATE TABLE T (
  a1 INTEGER,
  b1 INTEGER,
  c1 INTEGER,
  d1 INTEGER REFERENCES D,
  t1 INTEGER,
  PRIMARY KEY (a1, b1, c1, d1, t1),
  FOREIGN KEY (a1, b1, c1) REFERENCES S
);
```
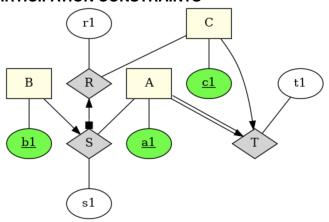
IS-A


```sql
DROP TABLE IF EXISTS A, B, C, D, E, F CASCADE;
CREATE TABLE A (
  a1 INTEGER PRIMARY KEY,
  a2 INTEGER
);

CREATE TABLE B (
  a1 INTEGER PRIMARY KEY REFERENCES A ON DELETE CASCADE,
  b1 INTEGER
);

CREATE TABLE C (
  a1 INTEGER PRIMARY KEY REFERENCES A ON DELETE CASCADE,
  c1 INTEGER
);

CREATE TABLE D (
  a1 INTEGER PRIMARY KEY REFERENCES B REFERENCES C ON DELETE
      CASCADE,
  d1 INTEGER
);

CREATE TABLE E (
  a1 INTEGER PRIMARY KEY REFERENCES C
  ON DELETE CASCADE, e1 INTEGER
);

CREATE TABLE F (
  a1 INTEGER PRIMARY KEY REFERENCES C
  ON DELETE CASCADE, f1 INTEGER
);
```

WEAK ENTITY


```sql
DROP TABLE IF EXISTS A, B, C CASCADE;
CREATE TABLE A (
  a1 INTEGER PRIMARY KEY,
  a2 INTEGER
);

CREATE TABLE B (
  a1 INTEGER REFERENCES A ON DELETE CASCADE,
  b1 INTEGER,
  b2 INTEGER,
  PRIMARY KEY (a1, b1)
);

CREATE TABLE C (
  a1 INTEGER,
  b1 INTEGER,
  c1 INTEGER,
  c2 INTEGER,
  PRIMARY KEY (a1, b1, c1),
  FOREIGN KEY (a1, b1) REFERENCES B ON DELETE CASCADE
);
```

PARTICIPATION CONSTRAINTS


```sql
-- merge A and T
CREATE TABLE B (
  b1     integer,
  PRIMARY KEY (b1)
);

CREATE TABLE C (
  c1     integer,
  PRIMARY KEY (c1)
);

CREATE TABLE AT (
  a1     integer,
  c1     integer NOT NULL,
  t1     integer NOT NULL,
  PRIMARY KEY (a1),
  UNIQUE (c1),
  FOREIGN KEY (c1) REFERENCES C
);

CREATE TABLE S (
  a1     integer NOT NULL,
  b1     integer,
  s1     integer NOT NULL,
  PRIMARY KEY (b1),
  FOREIGN KEY (a1) REFERENCES AT,
  FOREIGN KEY (b1) REFERENCES B
);

CREATE TABLE R (
  b1     integer,
  c1     integer NOT NULL,
  r1     integer NOT NULL,
  PRIMARY KEY (b1),
  FOREIGN KEY (c1) REFERENCES C,
  FOREIGN KEY (b1) REFERENCES S
);
```