MODEL ANSWERS :: Examples Clinic 3

Mapping Entity-Relationship Diagrams into Relational Schemas

T1.

```
         SHIP (PK:SNAME, OWNER, FK:TYPE, FK:PNAME)
    SHIP_TYPE (PK:TYPE, TONNAGE, HULL)
STATE_COUNTRY (PK:NAME, CONTINENT)
 SEAOCEANLAKE (PK:NAME)
SHIP_MOVEMENT (PK:{FK:S_SNAME, DATE, TIME}, LONGITUDE, LATITUDE)
         PORT (PK:{FK:S_C_NAME, PNAME, FK:S_O_L_NAME})
   PORT_VISIT (PK:{FK:P_V_SNAME, FK:P_V_PNAME, STARTDATE}, ENDDATE)
```

Note that the mapping algorithm suggests that you should create another relation

```
  SHIP_AT_PORT (PK:{FK:P_V_SNAME, FK:P_V_PNAME, STARTDATE})
```

However, all the information that this relation would convey is already conveyed by PORT_VISIT**. This is because** PORT_VISIT **is a weak entity type and therefore imports the primary key of its owner entity type through the identifying relationship** SHIP_AT_PORT**. Since** SHIP_AT_PORT **only contains attributes that are part of the primary key, it cannot have any additional information that is not already present in** PORT_VISIT**.**

T2:

Primary keys: (see above)

Foreign keys: (see above) + references below:

```
         SHIP ->     SHIP_TYPE (FK:TYPE)
         SHIP ->          PORT (FK:PNAME)

SHIP_MOVEMENT ->          SHIP (FK:S_SNAME)

         PORT -> STATE_COUNTRY (FK:S_C_NAME)
         PORT ->  SEAOCEANLAKE (FK:S_O_L_NAME)

   PORT_VISIT ->          SHIP (FK:P_V_SNAME)
   PORT_VISIT ->          PORT (FK:P_V_PNAME)
```