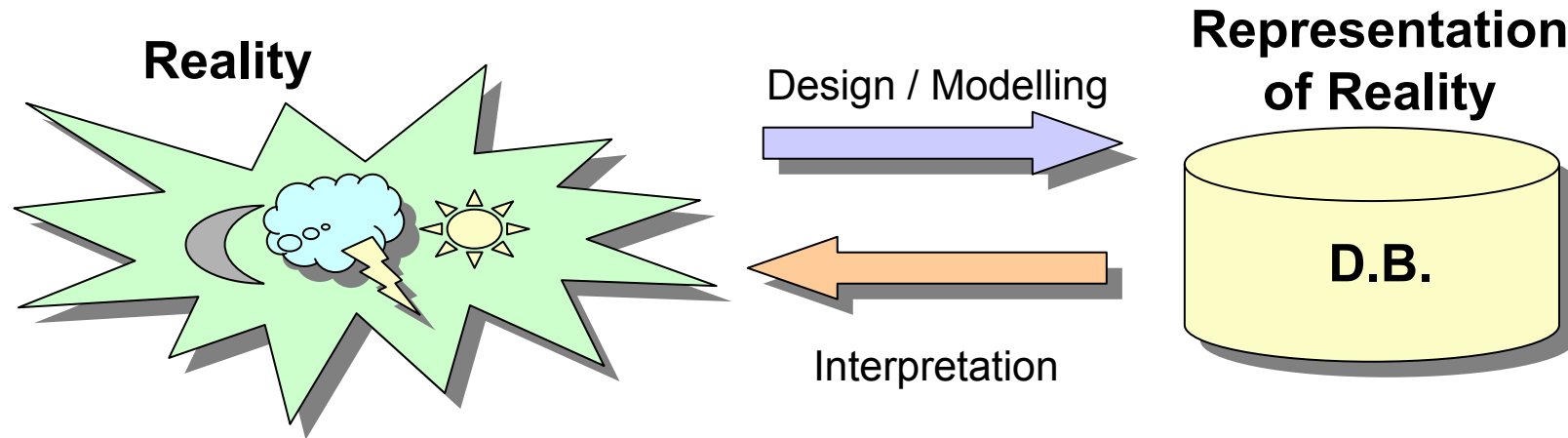


Lab II

Representation of Reality

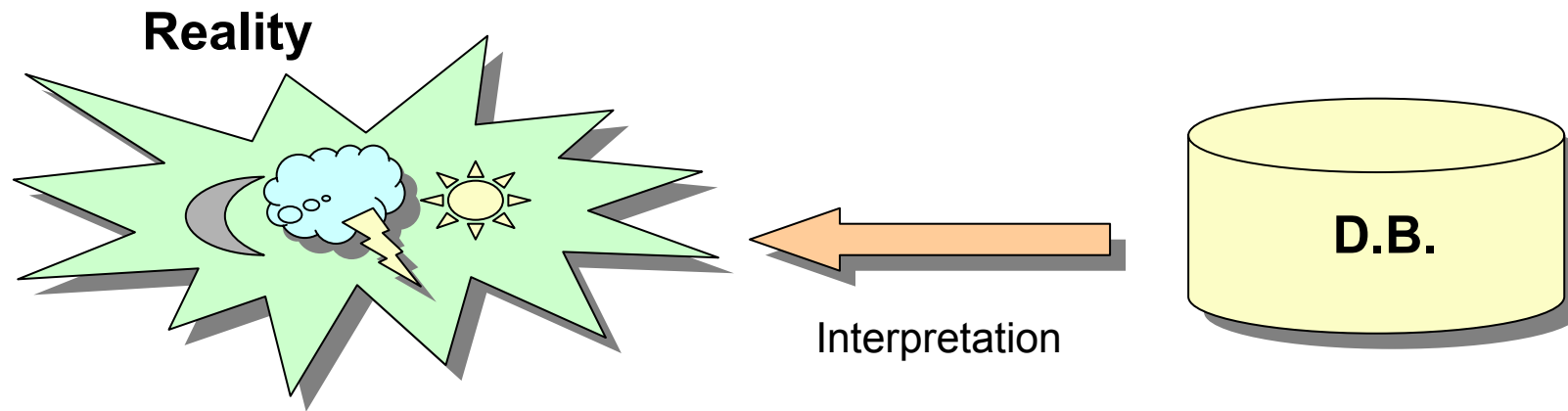
Database Laboratory

Representation of Reality



- For each object in reality about which we want to have information we define a relation whose attributes denote the most significant properties of these objects (code, name, ...) in such a way that each tuple which is present in this relation must be interpreted as a particular instance of an object;
- In order to represent associations between objects we use explicit references through attributes which identify each object.

Interpretation of a Database Schema



Intepretation. Examples

- GEOGRAPHICAL INFORMATION

RIVER (rcod: d_rcod, name: d_nom, length: d_long, mcod: d_mcod)

PK: {rcod}

FK: {mcod} -> SEA

SEA (mcod: d_mcod, name: d_nom, details: d_det)

PK: {mcod}

PROVINCE (pcod: d_pcod, name: d_nom, extension: d_ext)

PK: {pcod}

CROSSES (rcod: d_rcod, pcod: d_pcod, km: d_km)

PK: {pcod,rcod}

FK: {pcod} -> PROVINCE

FK: {rcod} -> RIVER

LIMITS_WIH (pcod1: d_pcod, pcod2: d_pcod)

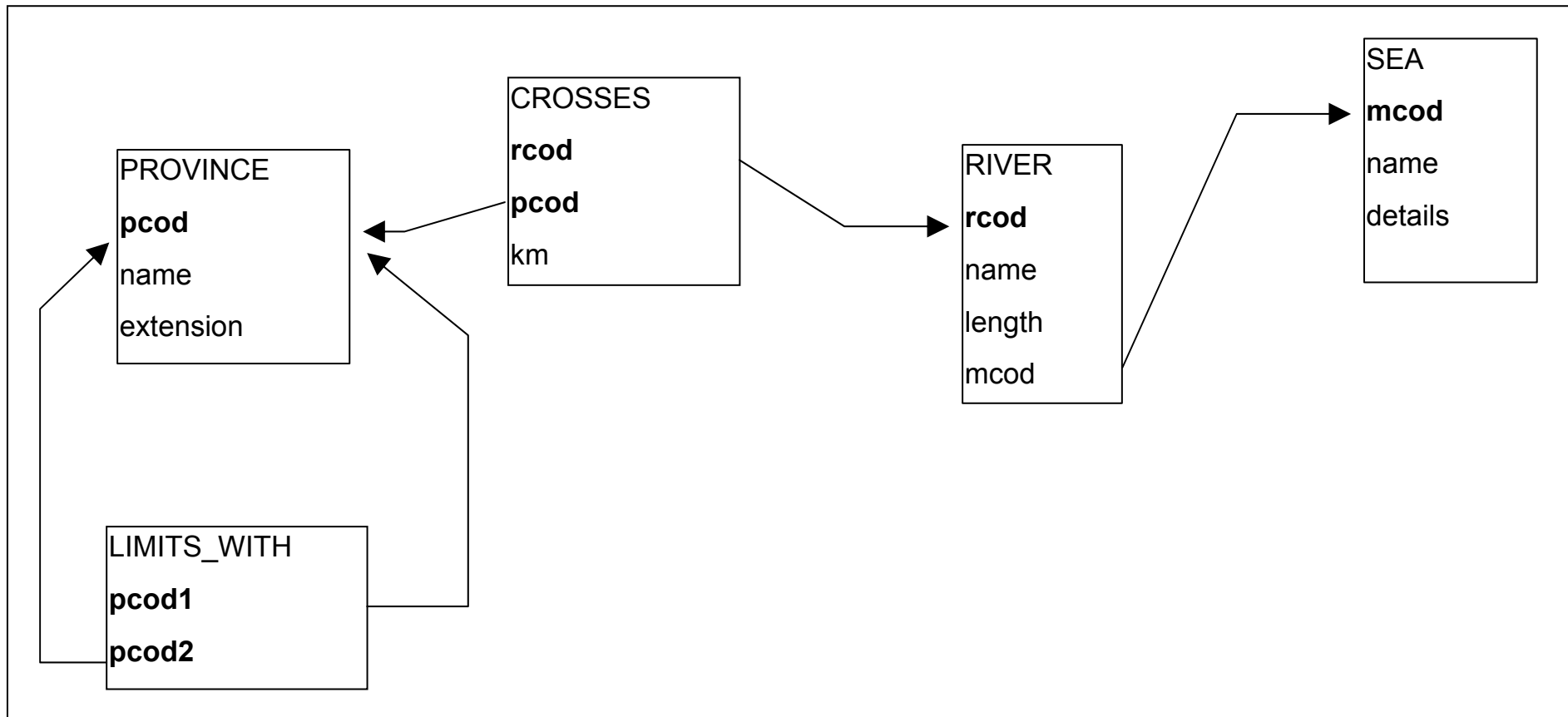
PK: {pcod1,pcod2}

FK: {pcod1} -> PROVINCE

FK: {pcod2} -> PROVINCE

Intepretation. Examples

- GEOGRAPHICAL INFORMATION



Intepretation. Examples

- COMPANY

SUPPLIER (vcod: d_vcod, name: d_nom1, city: d_ciu)

PK:{vcod}

PIECE(zcod: d_zcod, name: d_nom2, colour: d_colour, weight: d_weight, city: d_ciu)

PK:{zcod}

PROJECT(ycod: d_ycod, name: d_nom3, city: d_ciu)

PK: {ycod}

ORDER (vcod: d_vcod, zcod: d_zcod, ycod: d_ycod, quant: d_quant)

PK:{vcod, zcod, ycod}

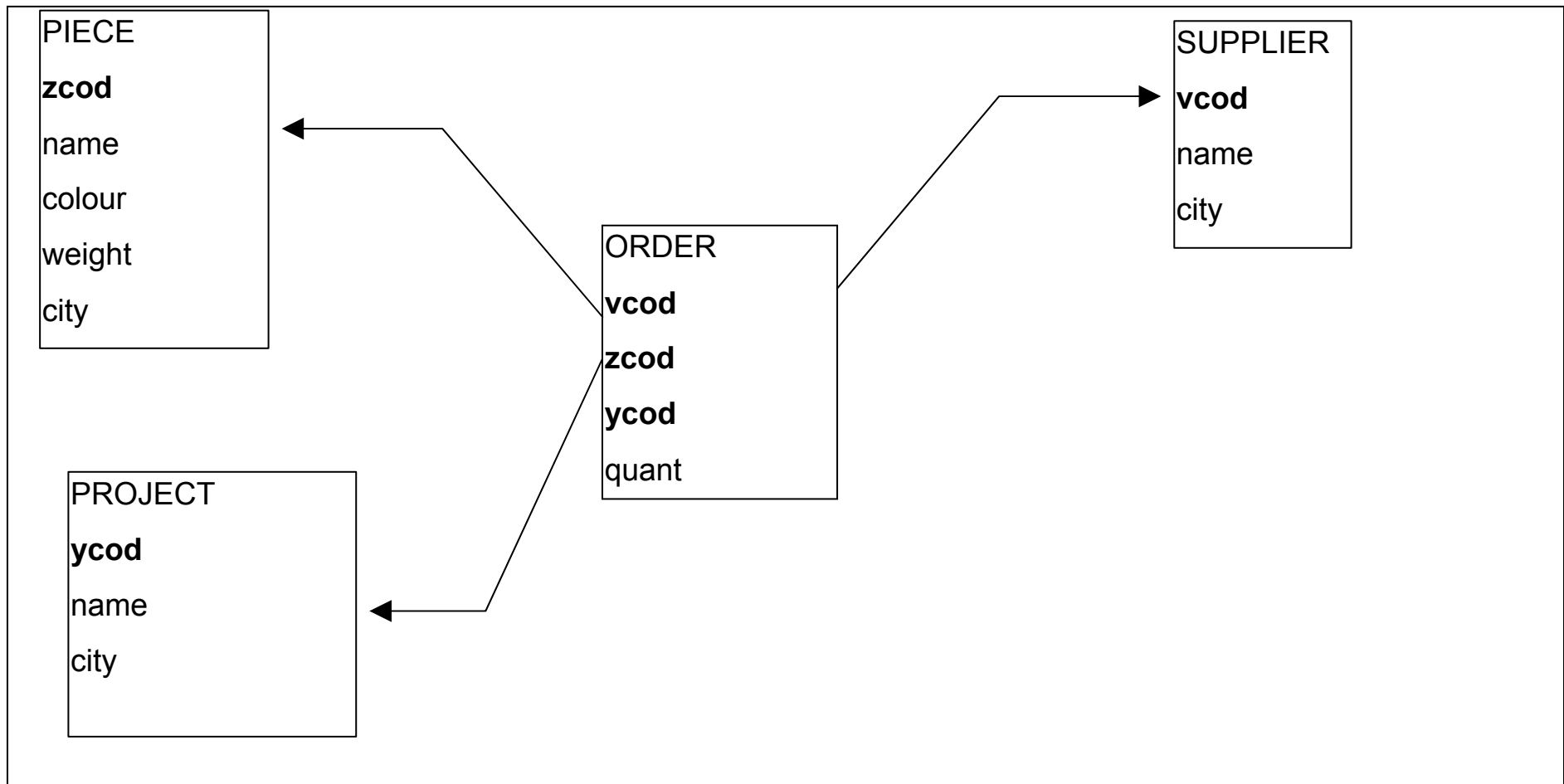
FK:{vcod} -> SUPPLIER

FK:{zcod} -> PIECE

FK:{ycod} -> PROJECT

Intepretation. Examples

- COMPANY



Intepretation. Examples

- LIBRARY:

USER (scod: d_scod, name: d_nom, address: d_dir)

PK: {scod}

BOOK (lcod: d_lcod, title: d_tit, author: d_author, topic: d_topic)

PK: {lcod}

FK:{topic} -> topic

HAS_READ (scod: d_scod, lcod: d_lcod)

PK: {scod, lcod}

FK: {scod} -> user

FK: {lcod}-> book

TOPIC (topic: d_topic, description: d_desc)

PK: {topic}

FIELD (topic: d_topic, subtopic: d_topic)

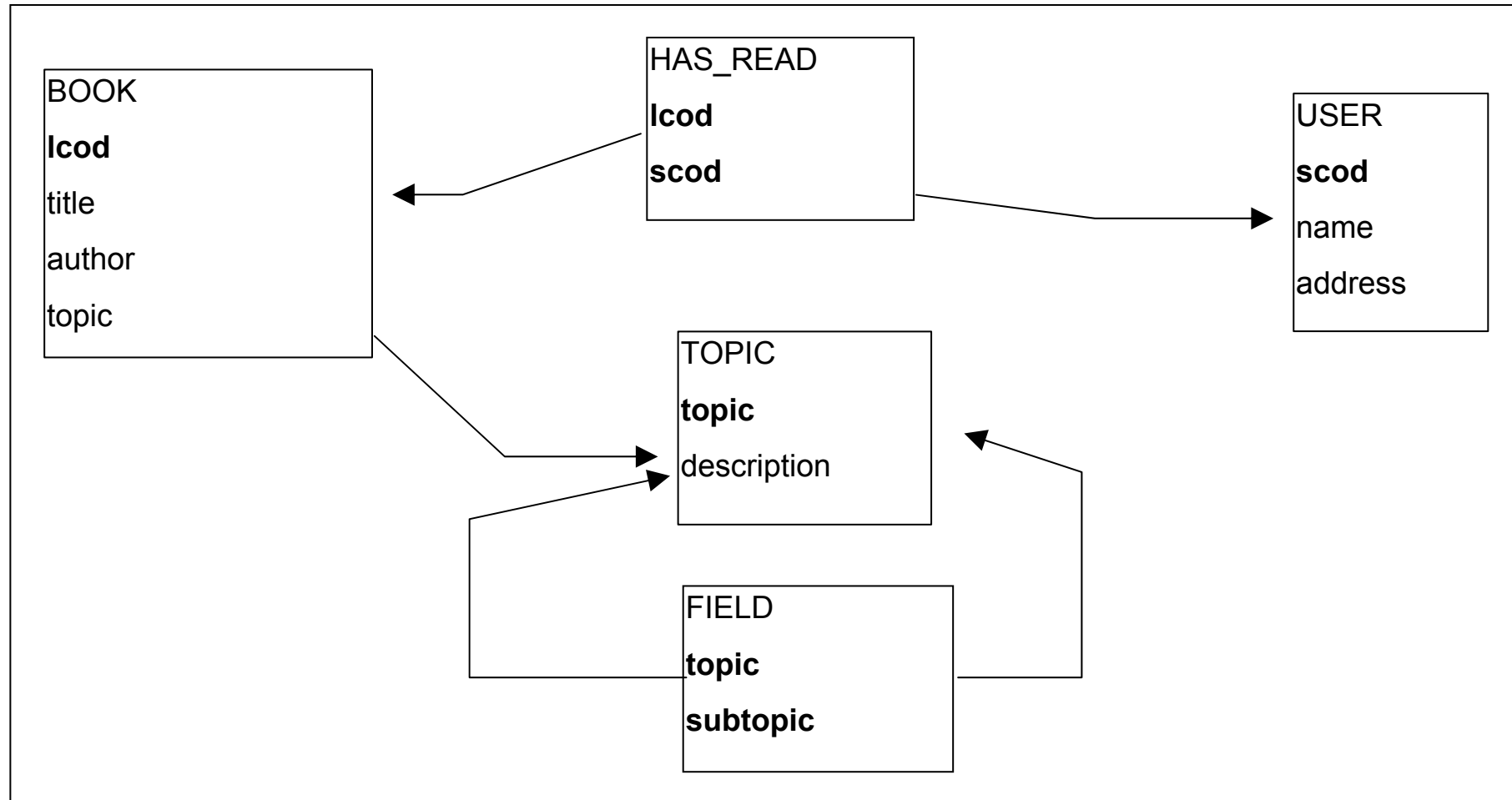
PK:{topic, subtopic}

FK:{topic} -> topic

FK:{subtopic} -> topic

Intepretation. Examples

- LIBRARY:



Intepretation. Examples

- RECORD COLLECTION:

COMPOSER (comp_name: d_name, year: d_year, country: d_country)

PK: {comp_name}

CONDUCTOR (cond_name: d_name, year: d_year, biography: d_bio)

PK: {cond_name}

WORK (work_cod: d_work_cod, title: d_title, year: d_year, comp_name: d_name)

PK: {work_cod}

FK: {comp_name } -> COMPOSER

DISC (ref: d_ref, name: d_name, year: d_year, company: d_comp)

PK: {ref}

IS_IN (workd_cod: d_work_cod, ref: d_ref, cond_name: d_name)

PK: {work_cod, ref}

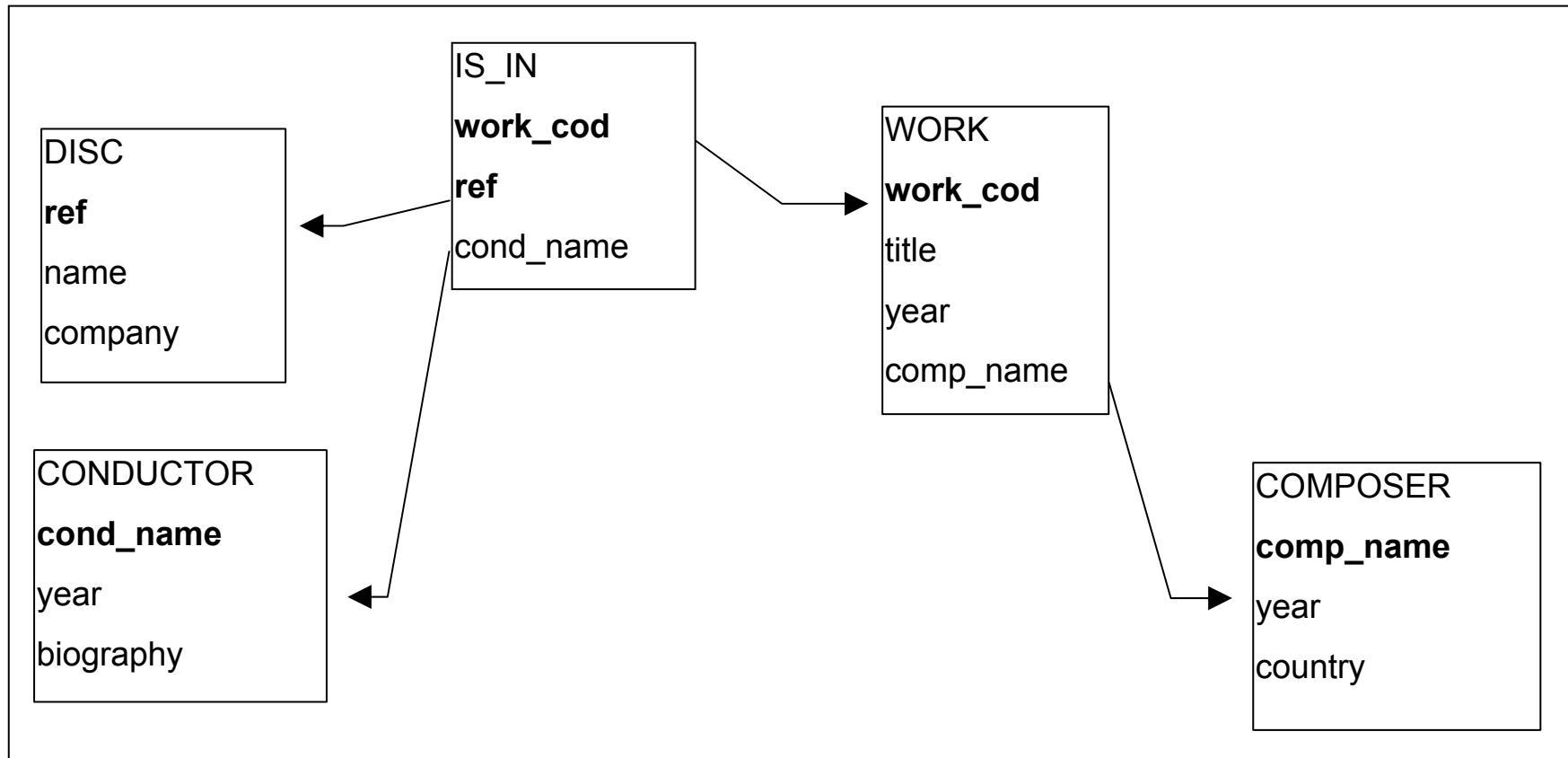
FK: {work_cod} -> WORK

FK: {ref} -> DISC

FK: {cond_name} -> CONDUCTOR

Intepretation. Examples

- RECORD COLLECTION:



Intepretation. Examples

- TRAVEL AGENCY:

TRIP(d_code, date: d_date, price: d_pri, dni_g: d_dni)

PK: {code}

FK: {dni_g} -> GUIDE

NNV: {date}

GUIDE(dni_g: d_dni, name: d_name, language: d_lan, age: d_age)

PK: {dni_g}

DRIVER(dni: d_dni, name: d_name, address: d_ad, age: d_age, gender: d_gen)

PK:{dni}

CITY(city_name: d_name1, history: d_his, inhabitants: d_inh)

PK:{city_name}

VISIT(code: d_code, city_name: d_nom1)

PK:{code, city_name}

FK:{code} -> TRAVEL

FK: {city_name} -> CITY

DRIVES(dni: d_dni, code: d_code)

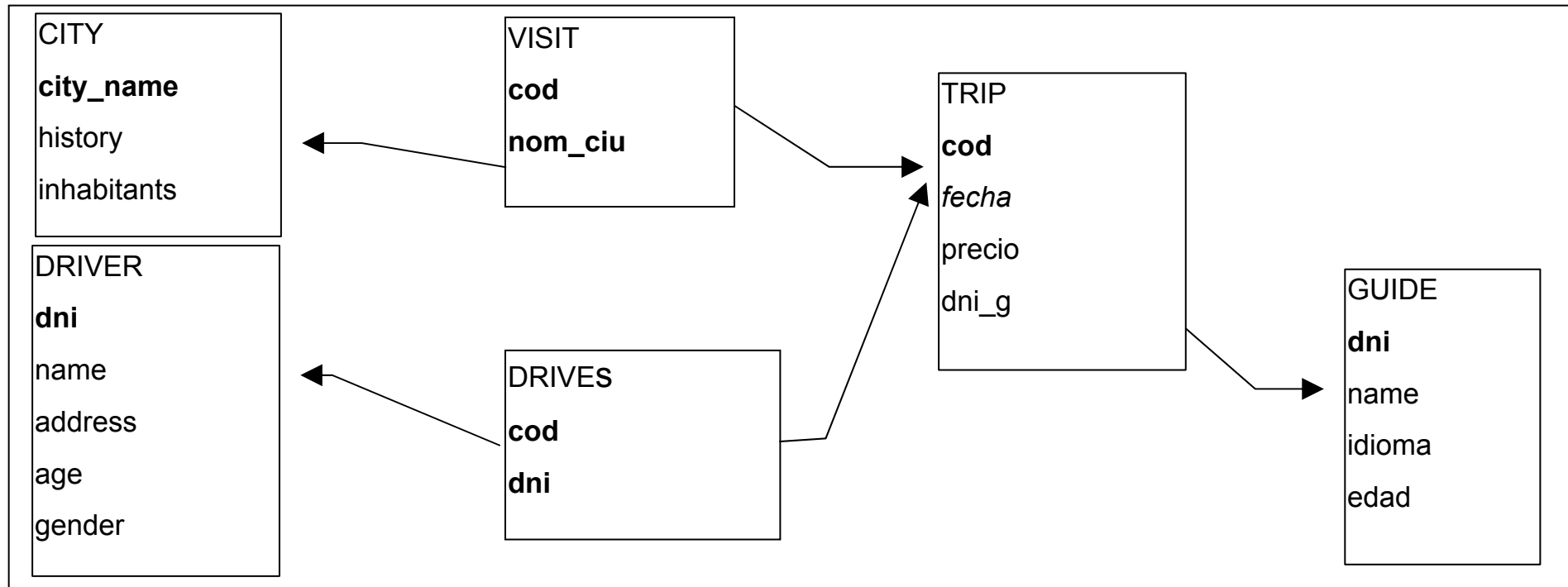
PK: {dni, code}

FK: {code} -> TRAVEL

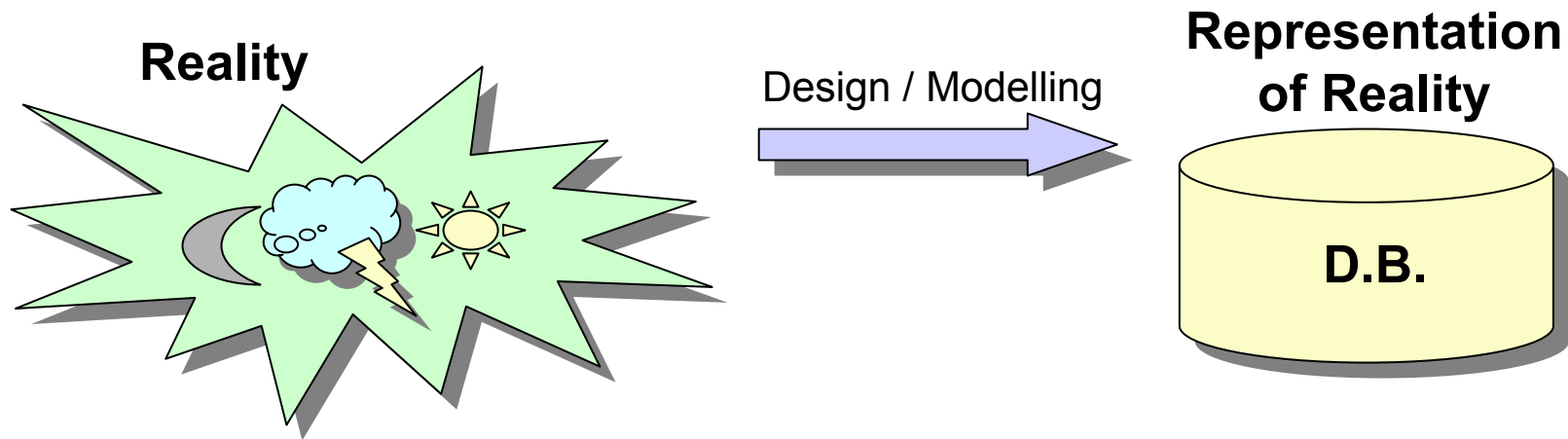
FK: {dni} -> DRIVER

Intepretation. Examples

- TRAVEL AGENCY:



Modelling of Reality



Modelling (examples)

CICLISMO

Objects: EQUIPO, CICLISTA, PUERTO, MAILLOT, ETAPA

For each EQUIPO (TEAM): name ("nombre"), the coach ("director") and the racers ("ciclistas") who compose the team.

For each CICLISTA (RACING CYCLIST): "dorsal" number (cyclist number assigned to the cyclist during the race), name, age, name of the team he belongs to, stages ("etapas") he has won, mountain passes ("puertos") he has gone through on the first position and the maillots ("maillots") which he has worn in each stage.

For each PUERTO (MOUNTAIN PASS): name, maximum height, category ("1^a", "especial",...), slope ("pendiente"), stage where it is located and the cyclist who has passed it on first position.

For each MAILLOT (JERSEY): maillot code, prize level of the maillot ("tipo"), colour, prize for wearing it ("premio") and cyclists who have worn it.

For each ETAPA (STAGE): stage number, length of the stage in kms, departure city ("salida"), arrival city ("llegada") and the cyclist who has won the stage.

Modelling (examples)

CICLISMO

EQUIPO(nomeq: d_eq, director: d_nom)

CP: {nomeq}

CICLISTA(dorsal: d_dor, nombre: d_nom, edad: d_edad, nomeq: d_eq)

CP: {dorsal}

CAj: {nomeq} → EQUIPO

VNN: {nomeq}

ETAPA(netapa: d_nº, km: d_km, salida: d_ciu, llegada: d_ciu, dorsal: d_dor)

CP: {netapa}

CAj: {dorsal} → CICLISTA

PUERTO(nompuerto: d_nom, altura: d_alt, categoria: d_cat, pendiente: d_pen, netapa: d_nº, dorsal: d_dor)

CP: {nompuerto}

CAj: {netapa} → ETAPA

CAj: {dorsal} → CICLISTA

VNN: {netapa}

MAILLOT(codigo: d_cod, tipo: d_tipo, premio: d_pre, color: d_col)

CP: {codigo}

LLEVAR(dorsal: integer, netapa: d_nº, codigo: d_tipo)

CP: {netapa,codigo}

CAj: {netapa} → ETAPA

CAj: {dorsal} → CICLISTA

CAj: {codigo} → MAILLOT

VNN: {dorsal}

Modelling (examples)

MUSIC

Objects: COMPAÑÍA, DISCO, GRUPO, ARTISTA, CANCIÓN, CLUB

For each COMPAÑÍA (COMPANY): code, name, address ("dirección"), fax, telephone and discs which have been published by the company.

For each DISCO (DISC): code, name, date, company which publishes the disc, group that has recorded the disc and the songs it contains.

For each GRUPO (GROUP): code, name, date in which the group was created, country ("país"), artists who compose the group, company that has published it and fans club.

For each ARTISTA (ARTIST): dni, name and group that s/he belongs to.

For each CANCIÓN (SONG): code, title, duration and disc where it is found.

For each CLUB (FAN CLUB): code, name, main office ("sede"), number of fans and group which they admire.

Modelling (examples)

“MUSIC”

CANCIÓN(cod: d_can, título: d_tit, duración: d_dur)

CP: {cod}

VNN: {título}

COMPAÑÍA(cod: d_comp, nombre: d_nom, dir: d_dir, fax: d_tel, tfno: d_tel)

CP: {cod}

VNN: {nombre}

DISCO(cod: d_dis, nombre: d_nom, fecha: d_fecha, cod_comp: d_comp, cod_gru: d_gru)

CP: {cod}

CAj: {cod_comp} → COMPAÑÍA

VNN: {cod_comp}

CAj: {cod_gru} → GRUPO

VNN: {cod_gru}

ESTÁ(can: d_can, cod: d_dis)

CP: {can, cod}

CAj: {can} → CANCIÓN

CAj: {cod} → DISCO

Modelling (examples)

“MUSIC” (cont.)

GRUPO(cod: d_gru, nombre: d_nom, fecha: d_fecha, pais: d_pais)

CP: {cod}

VNN: {nombre}

ARTISTA(dni: d_dni, nombre: d_nom)

CP: {dni}

VNN: {nombre}

CLUB(cod: d_club, nombre: d_nom, sede: d_dir, num: d_num, cod_gru: d_gru)

CP: {cod}

CAj: {cod_gru} → GRUPO

VNN: {cod_gru}

VNN: {nombre}

PERTENECE(dni: d_dni, cod: d_gru, funcion: f_fun)

CP: {dni, cod}

CAj: {dni} → ARTISTA

CAj: {cod} → GRUPO

Modelling (examples)

“LIBRARY”

Objects: AUTOR, LIBRO, TOPIC, WORK, AMIGO

For each AUTOR ("author"): author's identifier, name, nationality and works ("obras") s/he has written.

For each OBRA ("work"): code of the work, title, year, area, author and works in which it is included.

For each TEMA ("topic"): identifier of the topic and a brief description.

For each LIBRO ("book"): identifier of the book, title, year, works it contain and its number, and the friends who have borrowed it.

For each AMIGO ("friend"): identifier number, name, telephone and books s/he has borrowed.

Modelling (examples)

“LIBRARY”

AUTOR(autor_id: string(4), nombre: string(35), nacionalidad: string(20))

Clave Primaria: {autor_id}

LIBRO(id_lib: string(10), titulo: string(80), año: integer, num_obras: integer)

Clave Primaria: {id_lib} VNN: {titulo}

TEMA(tematica: string(20), descripcion: string(50))

Clave Primaria: {tematica}

OBRA(cod_ob: integer, titulo: string(80), año: d_cat, tematica: string(20))

Clave Primaria: {cod_ob}

Clave Ajena: {tematica} → TEMA

Valor No Nulo: {titulo}

AMIGO(num: integer, nombre: string(60), telefono: string(10))

Clave Primaria: {num}

Valor No Nulo: {nombre}

Modelling (examples)

LIBRARY

PRÉSTAMO(num: integer, id_lib: string(10))

Clave Primaria: {num,id_lib}

Clave Ajena: {num} → AMIGO

Clave Ajena: {id_lib} → LIBRO

ESTÁ_EN(cod_ob: integer, id_lib: string(10))

Clave Primaria: {cod_ob,id_lib}

Clave Ajena: {cod_ob} → OBRA

Clave Ajena: {id_lib} → LIBRO

ESCRIBIR(cod_ob: integer, autor_id: string(4))

Clave Primaria: {cod_ob,autor_id}

Clave Ajena: {cod_ob} → OBRA

Clave Ajena: {autor_id} → AUTOR