

8. Exercise: CAD Data in Databases

1. Geometrical Data in RDBMS

For the storage of CAD data in RDBMS, the following alternatives exist:

- (1) Only metadata
- (2) Storage as BLOB
- (3) Storage in Database Filesystem
- (4) Storage as structured data in Tables

Explain the alternatives and discuss advantages and disadvantages regarding:

- Ease of access,
- Concurrent accesses by many engineers,
- Consistency, and
- Performance!

2. CAD Data in Object-Relational DBMS (ORDBMS)

- a) Given the example based on SQL:2003 below
- explain the effect of the inheritance between the 2 types!
 - explain the effect of the table hierarchy!

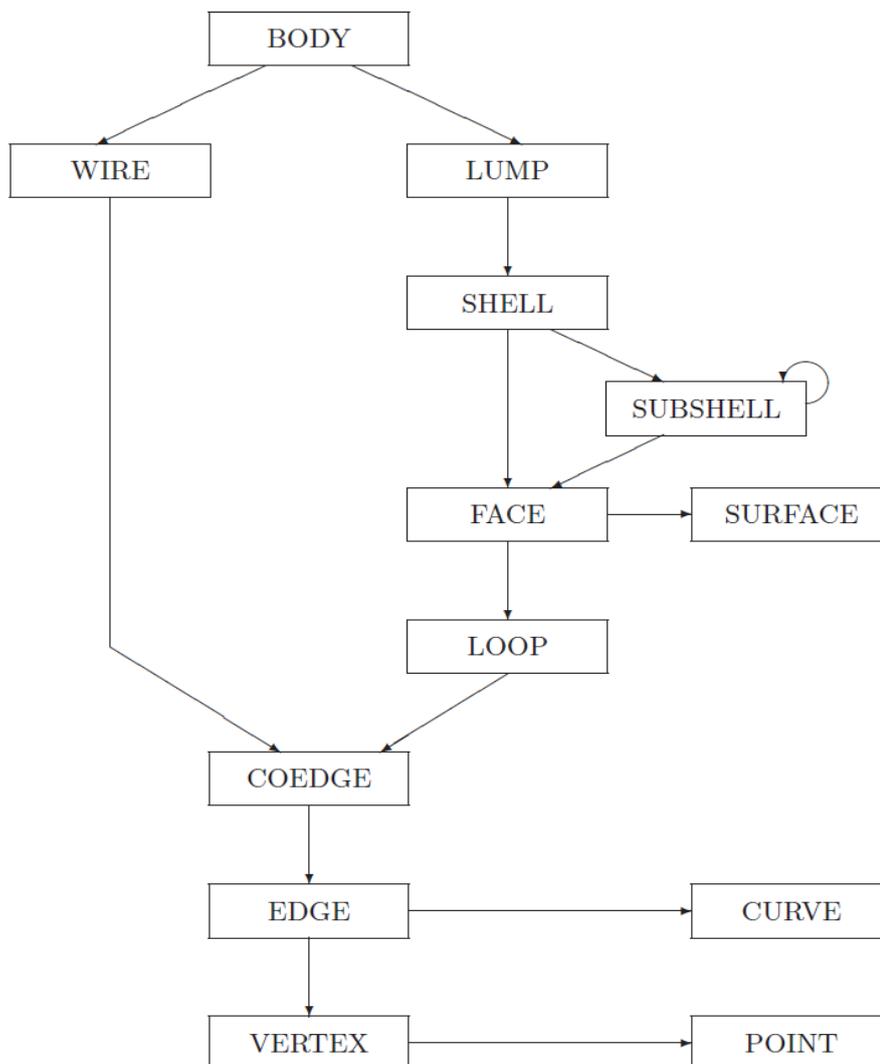
Refer to [1] (available in Google Books) for a short explanation of both concepts!

```
...  
CREATE TYPE geometry_type (  
    label          VARCHAR(100)  
);  
  
CREATE TYPE we_edge_type UNDER geometry_type (  
    vertex1       REF(we_vertex_type),  
    vertex2       REF(we_vertex_type),  
    aface         REF(we_face_type),  
    bface         REF(we_face_type),  
    neighbours    REF(we_edge_type) ARRAY(4),  
);  
  
CREATE TABLE geometry_object OF geometry_type;  
CREATE TABLE edge OF we_edge_type UNDER geometry_object;  
...
```


3. CAD Data in Object-oriented DBMS

Assuming the ACIS schema from [3] in the graphics below (where rectangles represent types/classes and arrows represent references/pointers):

- Explain the persistence concepts of *Named Objects* and *Persistence by Reachability*
- What would be a suitable (named) entry object to store a geometry? Why?



[1] J.Melton: Advanced SQL, 1999: Understanding Object-relational and Other Advanced Features.

[2] A. Kemper, M. Wallrath: An Analysis of Geometric Modeling in Database Systems. ACM Comput. Surv. 19(1): 47-91 (1987)

[3] I. Stroud: Boundary Representation Modelling Techniques. Springer 2006. ISBN-10: 0-387-84628-312-4