Normalization exercises

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Note: For each of the following exercises complete the following tasks:

1. (Complete after lesson 1) Find what normal form each of the following tables satisfies.Motivate the answer according the definition of normal forms seen in class.
2. (Complete after lesson 2) Apply the normalization algorithms seen in class to each table. Use intermediate refinements, i.e. if the table is in 1NF first normalize in 2NF and, if necessary, in BCNF.

Exercise 1 - Lockers The attribute `locker` is multivalued and id is unique within the multivalue attribute.

locker					
<u>teacher_id</u>	name	surname	locker		
			id	key_num	size

Exercise 2 - Library The attribute `borrowed_books` is multivalued and the combination { `author,title,date` } is unique within this attribute.

library						
<u>card_num</u>	name	surname	borrowed_books			
			author	title	date	return_date

Exercise 3 - Books The following functional dependencies are defined on the table:

- `author` → `author_bdate`
- `title` → `genre,pages,section`

books					
<u>author</u>	<u>title</u>	books	author_bdate	pages	section

Exercise 4 - Houses The following functional dependencies are defined on the table:

- `postal_code` → `address,price,size`
- `owner` → `owner_account`

houses							
owner	postal_code	address			price	size	account
		city	street	number			

Exercise 5 - Port The following functional dependencies are defined on the table:

- `ship_name` → `docked_at,country,weight,class`
- `docked_at` → `country`
- `captain` → `cpt_license`

port						
ship_name	captain	cpt_line	weight	class	docked_at	country

Exercise 6 - Cellar The following functional dependencies are defined on the table:

- `producer` → `country,location`
- `wine` → `bottling_date,price/l,grape_variety`
- `location` → `country`
- `grape_variety` → `price/l`

Cellar						
producer	wine	bottling_date	price/l	country	location	grape_variety