SPM-Level Computer Science

It turns out, Computer Science (CS) for SPM (Malaysia Certificate of Education @MCE) deals mainly with database and web interface. I have developed database-related systems before, but I was doing it without having formal class on it. Basically, I simply wing-it based on what I know on how computers store data (i.e. C data types).

I need to help my son with some questions, so I looked up 'database normalization' and found some things. The good thing is the way I implemented my database is mainly the 'correct' way. The not-so-good thing is that I am NOT able to help my son much with the practice questions - simply too many terms that I am not familiar with. Just shows that implementations need not be theoretically developed - experience (and good fundamentals) can also help to produce relatively sufficient results.

Anyways, the main reason I am writing this here is to 'store' the following 'note' (for my personal future reference).

db_normalization.txt

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Database Normalization

Five 'rules' to make data normal: 1NF,2NF,...,5NF (NF=normal form)
- each rule builds on another, starting from 1NF
- 1NF/2NF/3NF -> Core Basics (normalization usually means 3NF!)
- 4NF/5NF -> Exceptions

*Note: Normalization is about grouping & connecting data the right way!

1NF is about
- atomic values
- unique identifiers

*Term: Imagine a spreadsheet -> [table] or [entity]

1NF rules
- a cell cannot contain more than 1 value
  = if it does, that column needs to be split into multiple columns
- each row (@record) must be unique
  = look for potential primary key
  = usually, we use system-generated (integers are better!)
- each column name must be unique
- there must be no repeating groups (or cells?)
  = it there are, remove and create new table (1NF!)

2NF rule
- all data/column(s) must depend on the primary key
  = if it does not, must be split into it own table (1NF!)
  = use primary key in new table as column value -> foreign key

3NF rule
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- primary key must define all non-key column(s)
  = non-key column(s) must not depend on any other key
  = if this is not met, must create new table and use foreign key to
link
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computing

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