Relational Database Design

Module 3: Gathering Information

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Outline

- **Information sources**
  - People (interviews)
  - Documentation (mission statement)

- **What information is needed?**
- **Sources to use?**

- **How to read a mission statement**

- **Interviews**

What is a data model?

- **A data model is NOT about**
  - entity types, attributes, and relationships
  - tables and columns

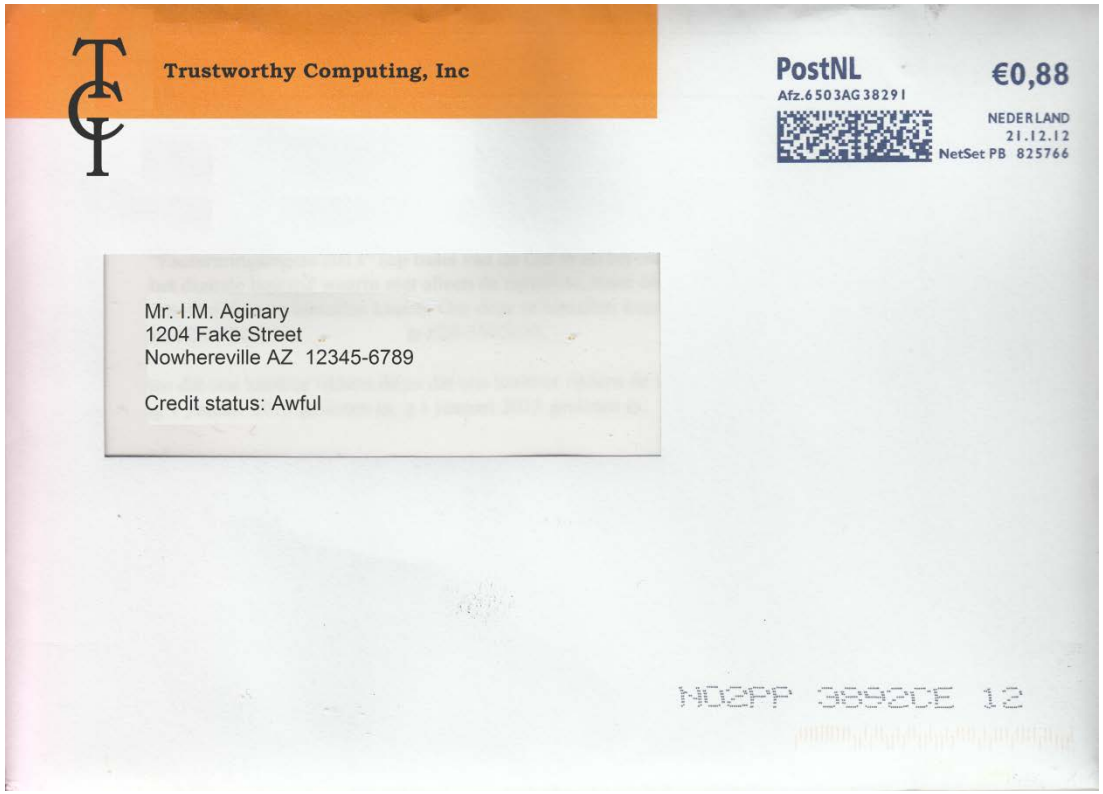
- **But a data model IS about**

FACTS

  - What types of facts to store?
  - Constraints

What is a data model?

- **What types of facts to store?**
  - No room for facts that the end user needs
    - Application may end up not used
    - Or end users will store facts in other fields



What is a data model?

- **What types of facts to store?**
  - No room for facts that the end user needs
    - Application may end up not used
    - Or end users will store facts in other fields
  - More types of facts than required
    - End users will simply skip through screens
    - Rubbish data (often a single letter) in mandatory fields

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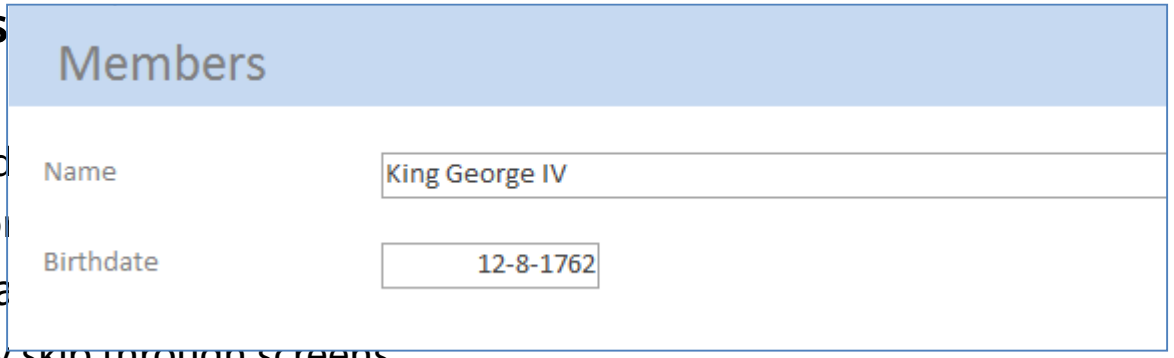

- **What are constraints?**
  - Valid data type
  - Valid range
  - Duplication
  - Consistent with other data

How to create a data model?

- **Finding the relevant fact types**
  - Mission statement
    - Broad overview
    - Informal, incomplete, inconsistent
  - Interviews
    - Management
    - Subject matter experts
    - End users
  - Interviewing style
    - Use concrete examples!
    - Adapt to language, jargon, and notation forms of person you interview

How to create a data model?

- **Finding the relevant constraints**
  - Same sources can be used
  - Constraints and fact types often found concurrently

How to create a data model?

- **Create the actual data model**
  - Identify functional dependencies
  - Normalize the data model

- **Use information gathered in previous steps**

Analyzing a mission statement

- **Mission statement**
  - Broad overview
  - Entire application, and business processes
  - Informal, vague, incomplete, inconsistent

- **Data model**
  - Exact description
  - Only the layout and rules of the database
  - Formal, concrete, complete, consistent

Analyzing a mission statement

- **How to read a mission statement**
  - Use highlighters
    - Fact types
    - Constraints
    - Examples
    - Other
  - Create examples to illustrate text (and check understanding)

During tournaments, such as the 2012 Christmas Tournament, each competing member plays three matches against different opponents. These matches last ninety minutes each. At the end of the match, the players write down how many frames each player has won, and their highest break.

Christmas 2012 Tournament

Match	Dave	Hugo
Result	3	0
Highest break	28 25	9

Interviews

- **Goals**
  - Find information
  - Verify conclusions
- **Abstraction level**
  - Data model = abstract level
    - Not everyone is able to understand and communicate at this level
  - Individual examples = instance level
    - Almost everyone understands individual concrete examples
- **Language**
  - Use *their* jargon, notation forms, language
  - Avoid *our* jargon
    - Entity types, relationships, attributes, constraints, cardinality, optionality, ……

Interviews

- **Use mission statement**
  - Examples you created to illustrate fact types and constraints
    - Are they a correct interpretation?
    - How can they be improved?
  - Fragments you categorized as “other”
    - Are they indeed irrelevant for the data model?
    - If not, why not?

Interviews

- **Use concrete examples**
  - Real
  - Fake, but realistic
- **Read facts from example**

http://commons.wikimedia.org/wiki/File:1896_telephone.jpg

Competition Score Form

League: C

Date: October 3, 2012

Players	Katie	Jim
Frames won	2	1
HB	40	12
	Frame results	
Frame 1	51	37
Frame 2	30	63
Frame 3	62	18

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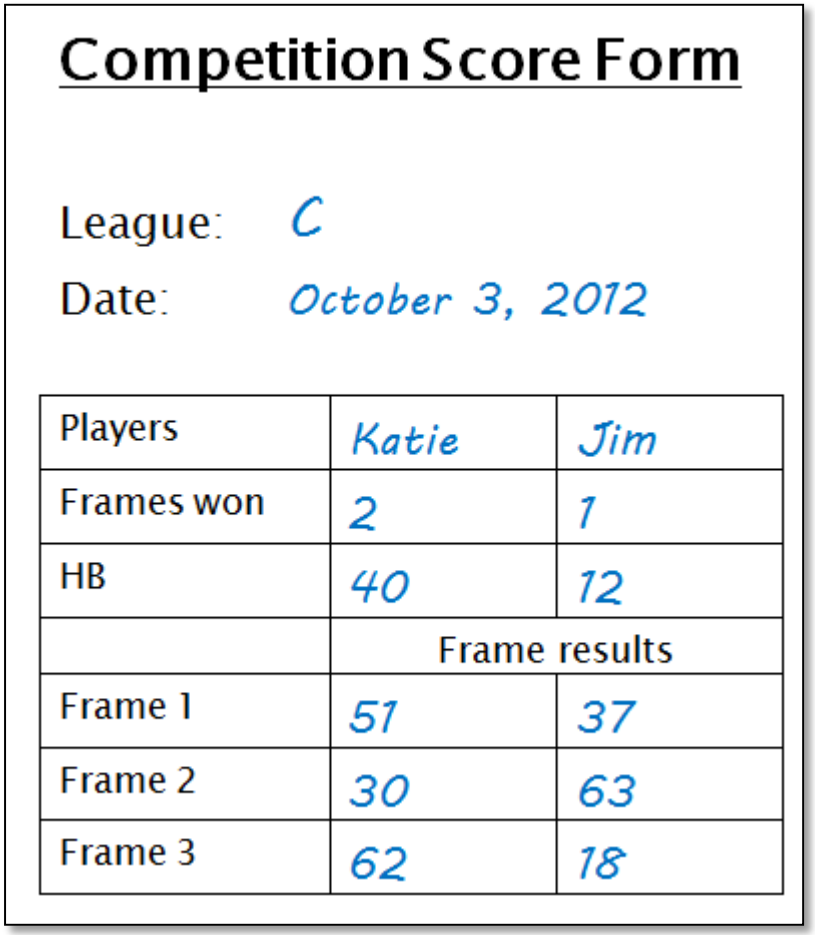
- **Highest break:**
  - Mandatory or optional?
  - Multiple or only one?



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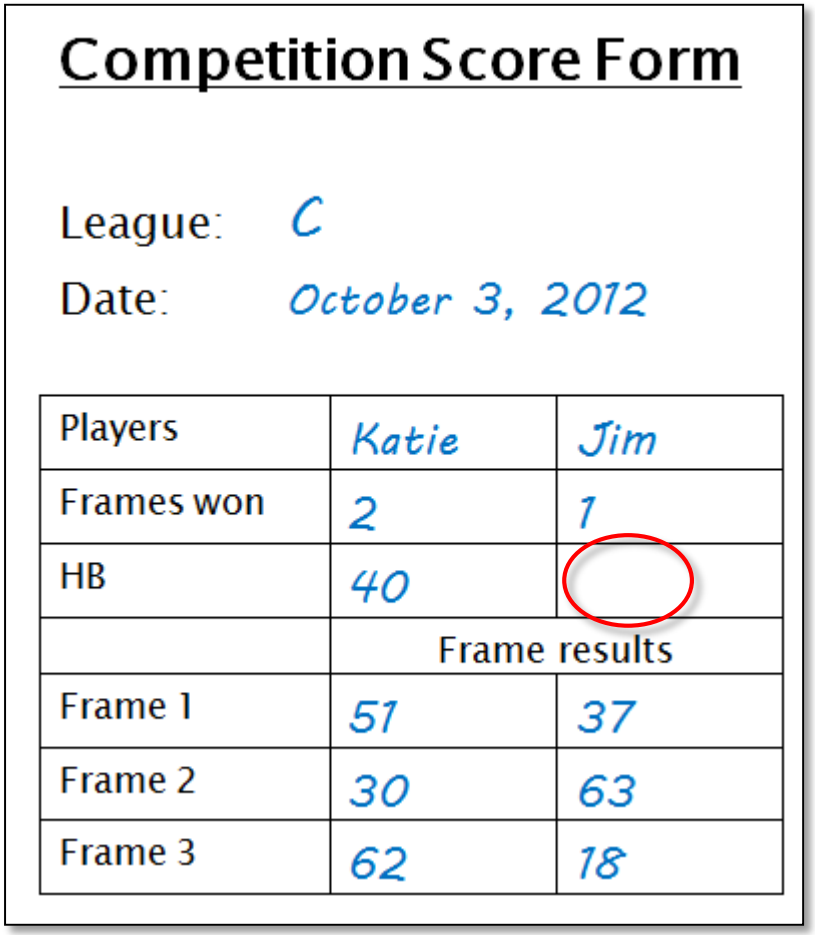

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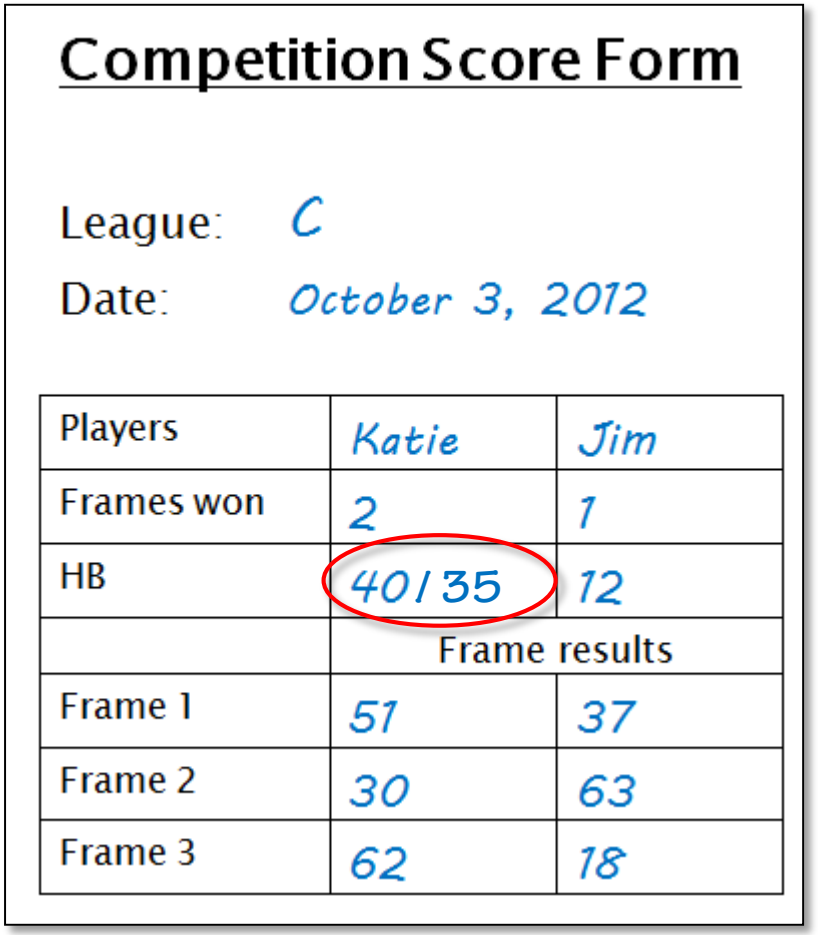

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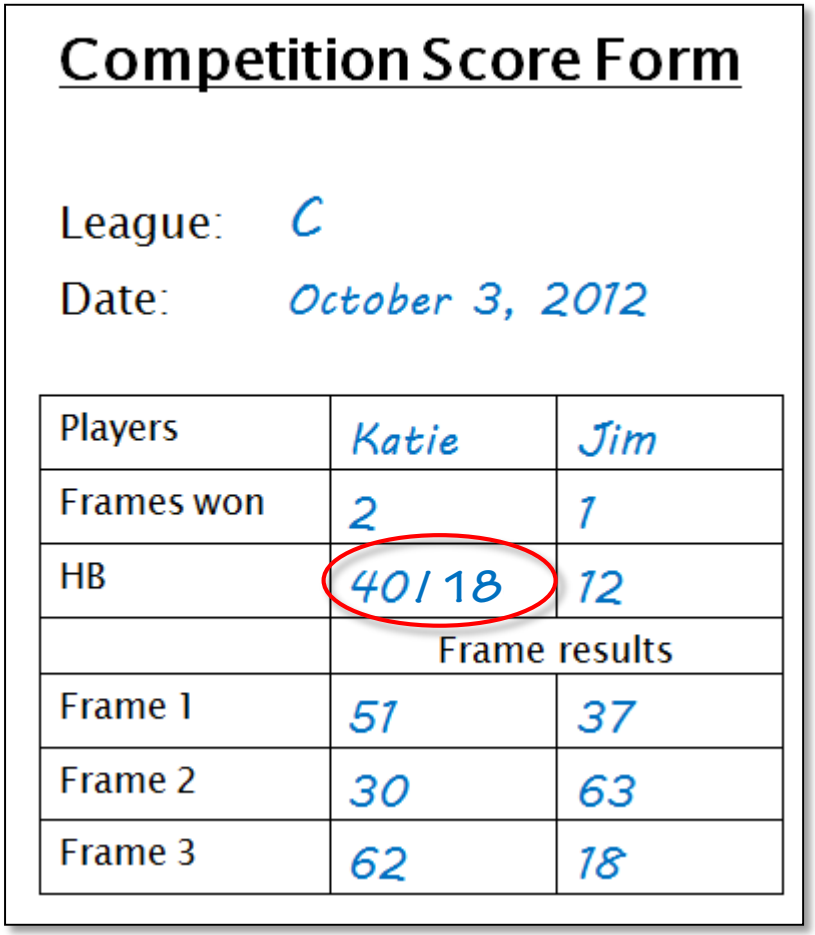

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Summary

- **Information required**
  - Fact types represented in the database
  - Constraints
- **Sources**
  - Mission statement
    - Assign content to categories
    - Use examples
  - Interviews
    - Read facts from examples
    - Use counter examples for constraints
- **Assumptions can be dangerous!**