Who I am: Joseph Gohlke (Ben's dad)

Education: UCF, BS Computer Science

Experience: almost 30 years in industry

- 10+ years - Telephone Billing, mostly writing DB access jobs
- 5 years - other
- 15 years – DOD, Military simulation

- Why have a Database?
- Data Persistence
- Data Integrity
  - Transaction Scope (Atomic Transactions)
    - Commit
    - Rollback (bank – money transfer from account to account)
- Locking
- Semaphores
- Multi-user data access/update

- What is a database?
  - Files
  - Running Application

- What is a database made up of:
  - Schema – Owner
  - Database Objects
  - Tables
  - Columns
  - Unique Constraints
  - Primary Keys
  - Foreign Keys, No orphans
    - Creating a child with no parent
    - Deleting a parent that has children
  - Indexes – Performance

- Data Modeling

SQL Definition (from Wikipedia):

Originally based upon relational algebra and tuple relational calculus, SQL consists of a data definition language and a data manipulation language. The scope of SQL includes data insert, query, update and delete, schema creation and modification, and data access control. Although SQL is often described as, and to a great extent is, a declarative language (4GL), it also includes procedural elements.

Table:

iron_yard_orl_users

User_name	String
Last_login	Date

User_Name	***Last_Login***
jgohlke	July 5, 2015
bgohlke	July 6, 2015

```
Select user_name from
iron_yard_orl_users;

     User_name
     -----------
     jgohlke
     bgohlke
```

```
Select user_name, last_login from
iron_yard_orl_users;

     User_name   Last_login
     ----------- -----------
     jgohlke     July 5, 2015
     bgohlke     July 6, 2015
```

1st Normal Form – Domain of the attribute is atomic and each value is only 1 item

Each attribute is dependent on the full key of the table.
No attribute is dependent on a subset of the full table key.

Master Record – Iron Yard Guest Contact

Key	***Sex***	***Eye Color***	***Hair Color***	***Height***
Joseph Gohlke	Male	Blue Eyes	Gray Hair	6'1"

1st Normal Form Cont'

For a US phone number, 10 digits in the format 3-3-4

No storing phone numbers like:

"407-730-3483, 407-205-1234"

If you need to model a 1:N relationship where a given master record has more than 1 phone number, it would look like:

- Child Record – Iron Yard Guest Phone Numbers

Master Key	***Phone***	***Phone Type***
Joe Gohlke	407-730-3483	Mobile
Joe Gohlke	407-123-4567	Office

2nd Normal Form – non-prime attributes not repeated (plus 1st NF)

Not like this:

Child Record – Iron Yard Guest Phone Numbers

Master Key	***Phone***	***Nickname***
Joseph Gohlke	407-730-3483	Joe
Joseph Gohlke	407-123-4567	Joe

2nd Normal Form Cont'

Like this instead:

Master Record – Iron Yard Guest Contact

Key	***Sex***	***Eye Color***	***Hair Color***	***Height***	***Nickname***
Joseph Gohlke	Male	Blue Eyes	Gray Hair	6'1"	Joe

3rd Normal Form – attributes are related to key

No transitive dependencies (plus 2nd NF)

Child Record - Vehicles

Key	***Manufacturer***	***Model***
Joseph Gohlke	Ford	Mustang
Joseph Gohlke	Ford	F-150

3rd Normal Form Cont'

Child Record - Office

Key	***Office Type***	***Work Phone***	***Office Address***
Joseph Gohlke	Corporate	407-321-5432	101 S Garland Suite 104 Orlando, FL
Joseph Gohlke	Home	407-123-4567	123 Some Street Anytown, FL

No storing non-key data twice!

- Slide deck available at:
- https://github.com/jgohlke/TIY_DBA_Concepts
- Email: jgohlke@gmail.com