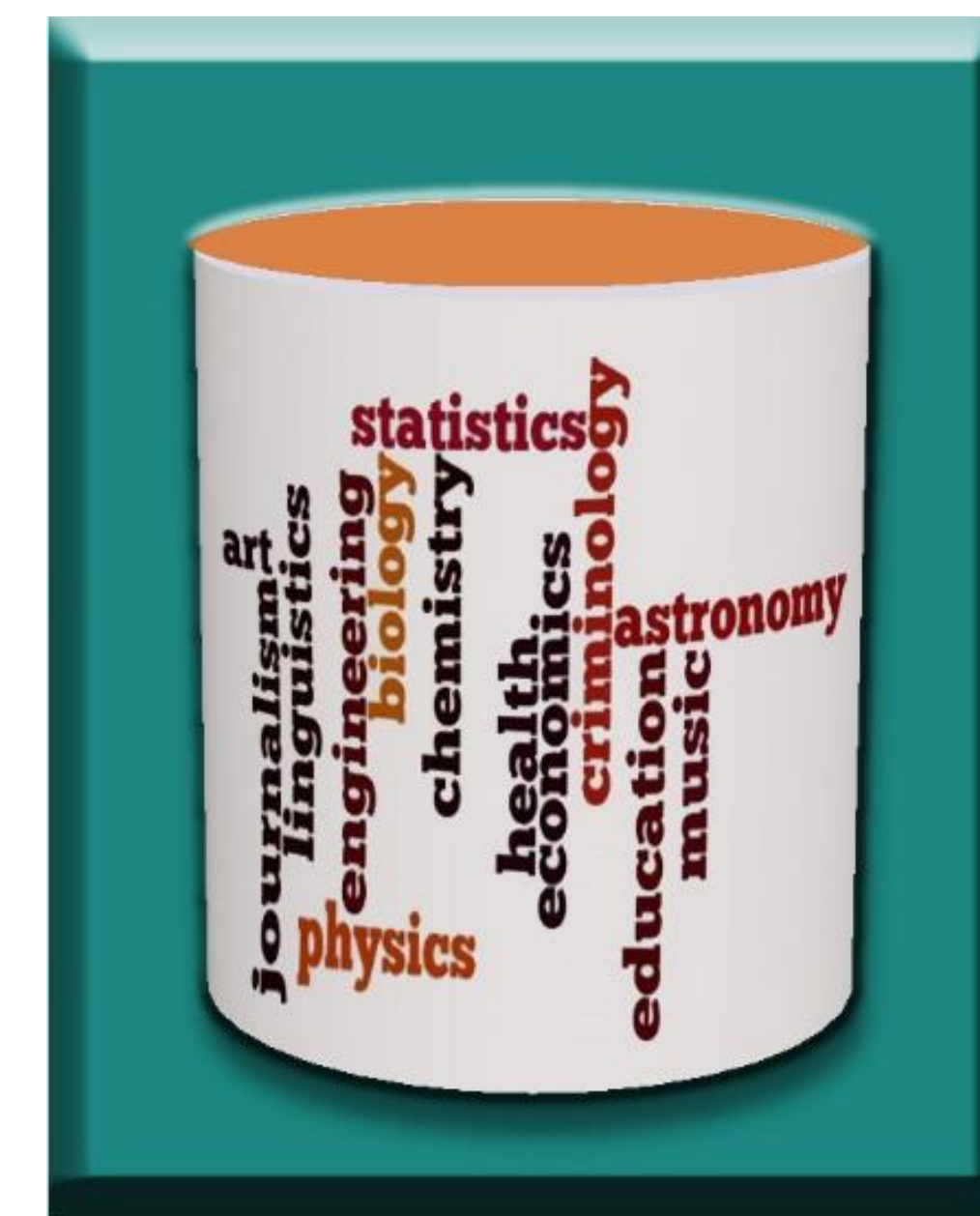


A New Tool for Guiding Faculty in Customizing Database Visualizations for Learners of Many Majors



CreateDB: Visual Customization Tool

Assists customizer in designing the database instance for the animations: verifies primary and foreign keys, as well as update, delete, and insert anomalies.

<http://databasesmanymajors.faculty.asu.edu>

Generates Files for Customization

After validating that the data instance satisfies the required constraints, the tool generates the XML files to assist with the customizations of the IntroDB, QueryDB, and DesignDB animations.

CreateDB: Verify Primary and Foreign Keys

Home

The spreadsheet in IntroDB represents a many-to-many relationship between the two tables.

Enter a name for the table representing this relationship, and click on the third column to name the attribute that describes the association.

Table4Columns

Table3Columns

Relationship

IntroDB

QueryDB

DesignDB

| cID | rID | kmRinC |
|-----|-----|--------|
| BO | PGY | 68 |
| BR | PGY | 967 |
| BR | RNG | 1546 |
| BR | PUT | 231 |
| BR | AMZ | 2465 |
| CO | AMZ | 47 |
| CO | PUT | 756 |
| PE | PUT | 413 |
| PE | AMZ | 545 |
| PE | PRS | 286 |
| VE | RNG | 76 |
| VE | APR | 1038 |

New Association Delete Association

Note that the combination of the key values must uniquely determine one value for the attribute. Click the red Verify button to check your table. Click the Save to File button to save your work.

Verify Save to File

Slow Medium Fast

Databases for Many Majors: Customizable Visualizations to Improve STEM Learning

- 2 Animations: IntroDB & QueryDB
- Customizations: CMB & GIS
- IEEE Trans on Education paper
DUE-0941584/DUE-0941401
- New Animation: DesignDB - Conceptual Design
- STEM Customizations:
Ecology, Statistics, Forensics, Astronomy
- Self-assessment "Checkpoints"
- CreateDB: Customization Tool

CreateDB: Verify Anomalies

Home

There are additional constraints that must hold on the data associations to illustrate update, delete, and insert anomalies.

| Country | cID | Pop | Capital | rID | River | System | kmRinC |
|-----------|-----|-----|----------|-----|-----------|---------|--------|
| Brazil | BR | 190 | Brasilia | PUT | Putumayo | Amazon | 231 |
| Brazil | BR | 190 | Brasilia | AMZ | Amazon | Amazon | 2465 |
| Brazil | BR | 190 | Brasilia | RNG | Rio Negro | Amazon | 1546 |
| Brazil | BR | 190 | Brasilia | PGY | Paraguay | Parana | 967 |
| Peru | PE | 29 | Lima | AMZ | Amazon | Amazon | 545 |
| Peru | PE | 29 | Lima | PUT | Putumayo | Amazon | 413 |
| Peru | PE | 29 | Lima | PRS | Purus | Amazon | 286 |
| Colombia | CO | 44 | Bogota | PUT | Putumayo | Amazon | 756 |
| Colombia | CO | 44 | Bogota | AMZ | Amazon | Amazon | 47 |
| Venezuela | VE | 26 | Caracas | APR | Apure | Orinoco | 1038 |
| Venezuela | VE | 26 | Caracas | RNG | Rio Negro | Amazon | 76 |
| Bolivia | BO | 9 | La Paz | PGY | Paraguay | Parana | 68 |

Click on a red button to validate and specify the data for the anomaly.

Update Delete Insert

Click the Save to File button to save your work.

Save to File

Slow Medium Fast

Play Spreadsheet Anomaly Generate Step

IntroDB: Introduction to Databases

Home

Data

Spreadsheet

Questions

Anomalies

Database

Breakdown

Relations

Keys

Queries

Checkpoint

Course is a foreign key in the StudentsTakingCourses table, since it references the primary key Course in the Courses table.

Students

| Name | ID | Classification | Major |
|----------------|------|----------------|------------------|
| Jeff Carter | 1111 | Junior | Computer Science |
| Anne Penny | 2222 | Senior | Computer Science |
| Fred Hopewell | 3333 | Freshman | Math |
| Andrew Spoth | 4444 | Junior | English |
| Valerie Dunbar | 5555 | Freshman | Math |

Courses

| Course | CourseTitle | Credits |
|---------|--------------------|---------|
| CSE 303 | Computation Theory | 3 |
| CSE 220 | Data Structures | 2 |
| ENG 476 | Old English Lit | 4 |
| MAT 118 | College Algebra | 3 |
| ENG 110 | American Lit | 2 |
| MAT 243 | Discrete Math | 3 |

StudentsTakingCourses

| ID | Course | Semester |
|------|---------|----------|
| 1111 | CSE 303 | SP2010 |
| 1111 | CSE 220 | FA2010 |
| 2222 | ENG 476 | SP2010 |
| 2222 | CSE 303 | SP2010 |
| 3333 | MAT 118 | FA2010 |
| 3333 | ENG 110 | SP2010 |
| 3333 | MAT 243 | SP2010 |
| 4444 | MAT 118 | FA2010 |
| 4444 | ENG 476 | SP2010 |
| 5555 | CSE 303 | SP2010 |
| 5555 | ENG 110 | SP2010 |
| 5555 | MAT 118 | FA2010 |

Slow Medium Fast

Play Intro Primary Gold Foreign Orange Review Step

QueryDB: Introduction to Querying

Home

Query

Sets

Filtering

Joining

SQL

Checkpoint

```
select T.Semester
from Students S, StudentsTakingCourses T
where S.ID = T.ID and
S.Name = "Jeff Carter" and
T.Course = "CSE 303"
```

Last, list the attributes wanted in the query result in the **select** clause.

Students

| Name | ID | Classification | Major |
|-------------|------|----------------|------------------|
| Jeff Carter | 1111 | Junior | Computer Science |

StudentsTakingCourses

| ID | Course | Semester |
|------|---------|----------|
| 1111 | CSE 303 | SP2010 |

Slow Medium Fast

Play Intro Design From Where Select Join Sets Union Except Intersect Step

DesignDB: Conceptual Design

Home

Design

ERDiagram

Entities

Relationships

Mapping

MoreDiagrams

Select an ER component to see how it is mapped in the relational schema below.

Students

| ID | Name | Class | Major | FID |
|------|-------------|--------|------------------|------|
| 1111 | Jeff Carter | Junior | Computer Science | 1111 |

Courses

| CrID | CrTitle | Credits |
|------|--------------------|---------|
| 303 | Computation Theory | 3 |

Faculty

| FID | FName | Title |
|------|-------------|-----------|
| 1111 | Jeff Carter | Professor |

Dept

| DID | DName |
|-----|------------------|
| 1 | Computer Science |

Slow Medium Fast

Play Intro Entities Relationships ManyToMany OneToMany OneToOne 1toN 1to1 Review Step