

A Visual Learning Tool for Database Operation

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“sAccess” – A web-based online tool for database learning

- Designed for database learning activity, especially for practices of **Relational Database operations**
- Simple command set: **easy to operate** databases
- **Preset datasets** are offered; **your original data** can be used too
- **Web application**: no need to install extra softwares or plugins



sAccess official website: <http://sAccess.eplang.jp/>

- You can try sAccess here anytime
- English version is now available!

Contact: saccess@klab.eplang.jp

Screenshot

result ← operation(count) → result ← operation(projection) → result

Result(count)(18)			
	hour	age	count_hour_age
1	Afternoon	Adult	15
2	Afternoon	Child	11
3	Afternoon	Elder	4
4	Afternoon	Young	10
5	Evening	Adult	2
6	Evening	Child	14
7	Evening	Elder	8
8	Evening	Young	10
9	Midnight	Adult	10
10	Midnight	Elder	4
11	Midnight	Young	6
12	Morning	Adult	10
13	Morning	Child	6
14	Morning	Elder	10
15	Morning	Young	15
16	Night	Adult	14

<=[count]=

Result(projection)(163)			
	maker	hour	age
1	Galaxyconfectionery	Morning	Young
2	Yamatoseichaen	Morning	Young
3	Rabbitdairy	Morning	Adult
4	Sasafood	Afternoon	Adult
5	Galaxyconfectionery	Afternoon	Child
6	Galaxyconfectionery	Afternoon	Child
7	Sasafood	Evening	Young
8	Yamatoseichaen	Evening	Elder
9	Princesamineral	Night	Elder
10	Yamatoseichaen	Night	Young
11	Galaxyconfectionery	Midnight	Adult
12	Marutakefood	Morning	Elder
13	Princesamineral	Morning	Child
14	Sasafood	Morning	Young
15	Sasafood	Afternoon	Adult
16	Sasafood	Afternoon	Adult
17	Galaxyconfectionery	Afternoon	Child
18	Sasafood	Evening	Young
19	Galaxyconfectionery	Evening	Adult
20	Galaxyconfectionery	Night	Elder
21	Galaxyconfectionery	Night	Adult
22	Galaxyconfectionery	Midnight	Adult
23	Sasafood	Morning	Young

<=[projection]=

Result(projection)(163)					
	pid	day	wday	hour	gend
1	G6148	4/1	Sun	Morning	Male
2	J0940	4/1	Sun	Morning	Fema
3	J7360	4/1	Sun	Morning	Male
4	G1342	4/1	Sun	Afternoon	Fema
5	G3944	4/1	Sun	Afternoon	Male
6	T0344	4/1	Sun	Afternoon	Fema
7	P2452	4/1	Sun	Evening	Male
8	J0589	4/1	Sun	Evening	Fema
9	S4777	4/1	Sun	Night	Male
10	J0589	4/1	Sun	Night	Fema
11	T6962	4/1	Sun	Midnight	Male
12	G2879	4/2	Mon	Morning	Fema
13	S4436	4/1	Sun	Morning	Male
14	P2331	4/2	Mon	Morning	Fema
15	G1678	4/2	Mon	Afternoon	Male
16	P2331	4/2	Mon	Afternoon	Fema
17	G6148	4/2	Mon	Afternoon	Male
18	P2331	4/2	Mon	Evening	Fema
19	T6962	4/2	Mon	Evening	Male
20	T2807	4/2	Mon	Night	Fema
21	T6962	4/2	Mon	Night	Male
22	G2320	4/2	Mon	Midnight	Male
23	P2678	4/3	Tue	Morning	Male

Command Area

Result Display Area

Targeted learning activity

- The main goal is **to understand the fundamental mechanism of database systems**
 - getting professional skill, such as developing database systems, is not the main goal
- Need to practice manipulation of **Relational Database**
 - Normalization, relational operations such as Projection/Selection/Join
- Need to learn **how to retrieve the intended data from database by making proper queries**
 - prior to master the syntax of the specific query language like SQL
- Assigned time for database class is limited
 - e.g. **Only 1-2 hours** can be used for database practices

Characteristics

Database operations by simple commands

- Complex operation can be done by combining multiple commands

table Sales	<input type="checkbox"/>
select wday Sun	<input type="checkbox"/>
select gender male	<input type="checkbox"/>
projection hour,age	<input type="checkbox"/>

(equivalent SQL:
***select hour,age from Sales
 where wday="Sun"
 and gender="male"***)

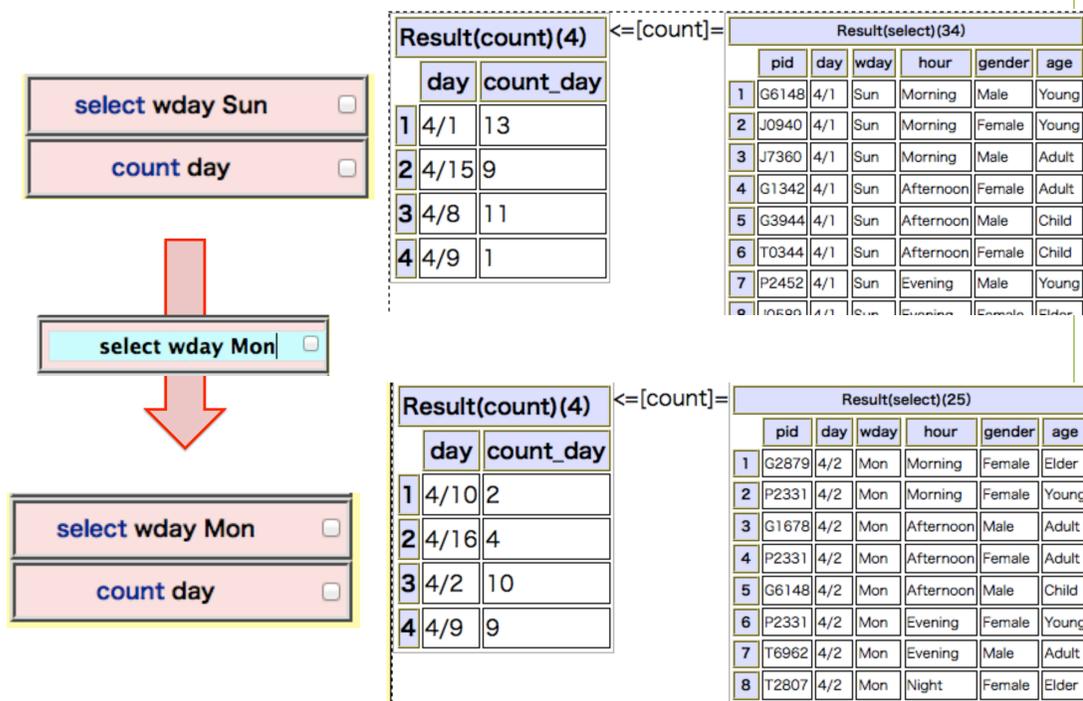
Command List

Selection	
SELECT	Extract records including specified keywords
REMOVE	Remove records including specified keywords
COMPARE	Extract records fulfilling specified criteria
DISTINCT	Remove duplicate records
Projection	
PROJECTION	Extract the specified fields
Join	
JOIN	Combine two tables (natural join)
ADD	Add fields of another table to current
Statistics	
SORT	Sort the records
SUM	Returns the total sum of numeric fields
AVG	Returns the average of numeric fields
COUNT	Count the number of records or values of the specified fields

(Each command has one or more options)

Description of the operation results with the transition of tables

- Enable to observe what change has occurred by each operation
- Add, modify, delete or change the order of commands and it will soon affect the transition of tables simultaneously
- **Easy to try-and-error operations for database practices**



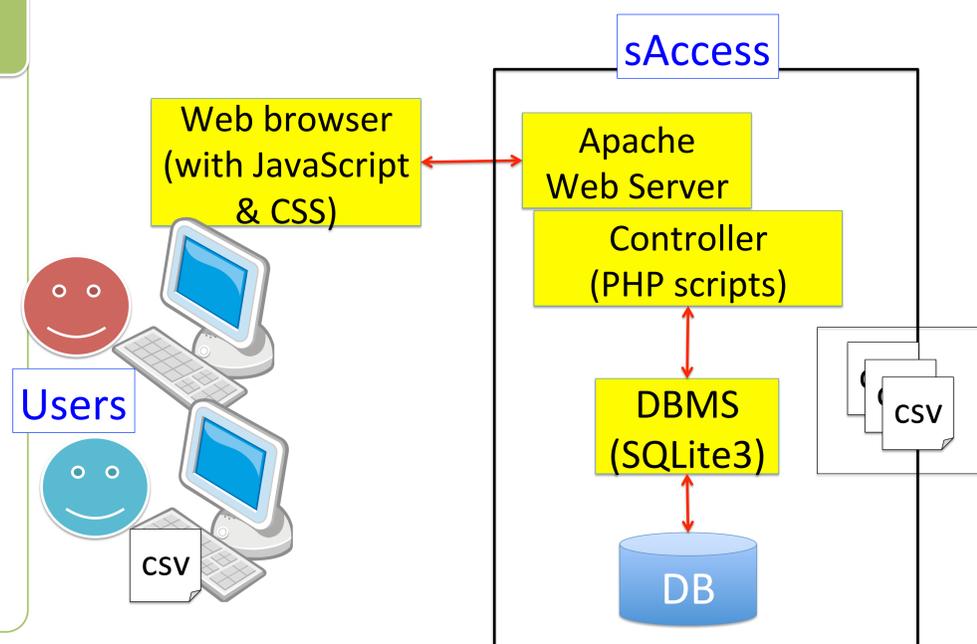
Internal design

Developed as an web application

- Apache + PHP5 + SQLite3 (banded with PHP5)
- Any major web browsers supporting JavaScript can use sAccess

Virtually independent database environment

- Temporary DB is given to each user
 - delete it when the user closes the web browser
- Each DB is independent from others
 - one user's operations never affect other's DB



Current situations & future work

- **Current situations**
 - Several high-schools and universities in Japan has used sAccess in real computer-science classes for non-professional students; in each cases teachers gave this system good evaluations
 - Some classes which used sAccess got better grades than those which used Microsoft Access
- **Future work**
 - Implementing learning support functions for schema design, including normalization
 - Class management mode: sharing single DB in a class to experience multiple database operations