

DandD Client Server System

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- Home Page

Needs for enough description of data

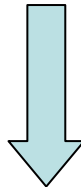
- Data without enough description can't say anything to us.
 - Data Storage
 - Nobody can understand the meaning of the data without enough description.
 - Collaboration
 - Many people are involved in data on the way from data collection to analysis.



We propose DandD which is a new environment for data and description.

The summary of DandD rule

- Principle
 - Element
 - DataVector (A sequence of numbers) + Attributes
 - Organization
 - Relational
 - Array
 - Background Information
 - Introduction
 - Reference
 - Relatives
 - DataSampling
- Implementation
 - XML (eXtensible Markup Language)
 - UTF-16



DandD Instance

A part of DandD Instance

<Data>

<Relational Id="r1" Columns="sulfate nitrate rainfall"/>

.....

</Data>

<DataBody>

<DataVector Id="sulfate"> 3.5 1.5 ...</DataVector>

<DataVector Id="nitrate"> 1.3 0.8 ...</DataVector>

<DataVector Id="rainfall"> 8.7 3.9 ...</DataVector>

.....

</DataBody>

A part of DandD Instance(2)

<DataBody>

```
<DataVector Id="v1" Access="a1" Protocol="b1"
           Query="c1" PostProcessing="d1" />
```

.....

External DataVector

</DataBody>

<Appendix>

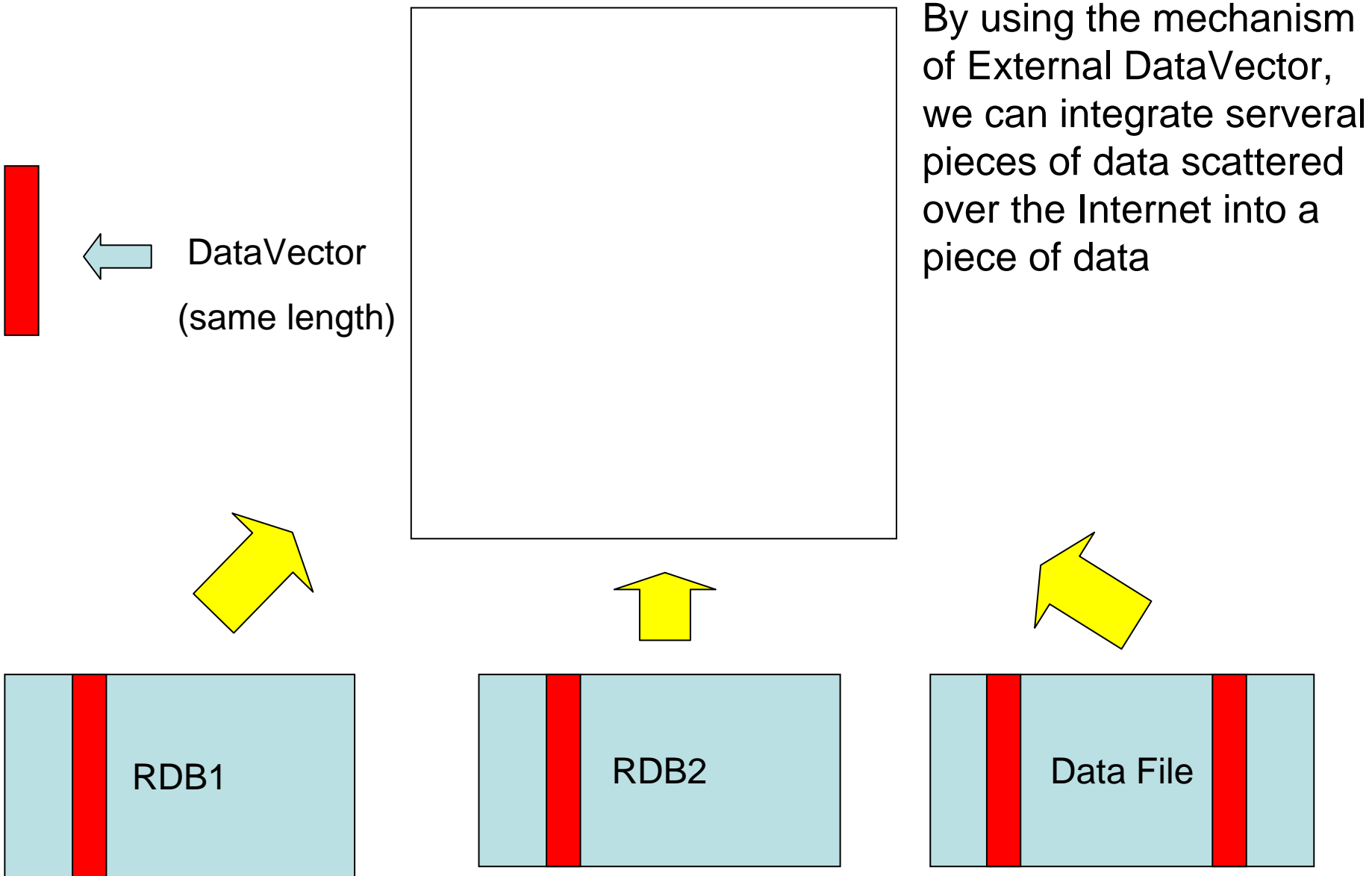
```
<Access Id="a1" IP="131.113.65.1" UserId="anonymous" />
<Protocol Id="b1" Physical="tcp">
  <JDBC DatabaseServer="131.113.65.1" DatabaseName="KobeQuake"/>
</Protocol>
<Query ="c1" Type="SQL">select date from kobequake</Query>
<ScanFormat Id="d1"> %*s,%s,%*s </ScanFormat>
```

.....

</Appendix>

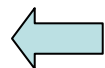
Ritei Shibata(2004), "InterDatabase and DandD", COMPSTAT2004

DandD instance(XML document)

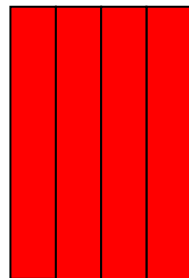


DandD instance

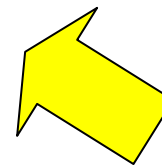
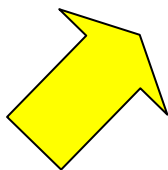
InterDatabase

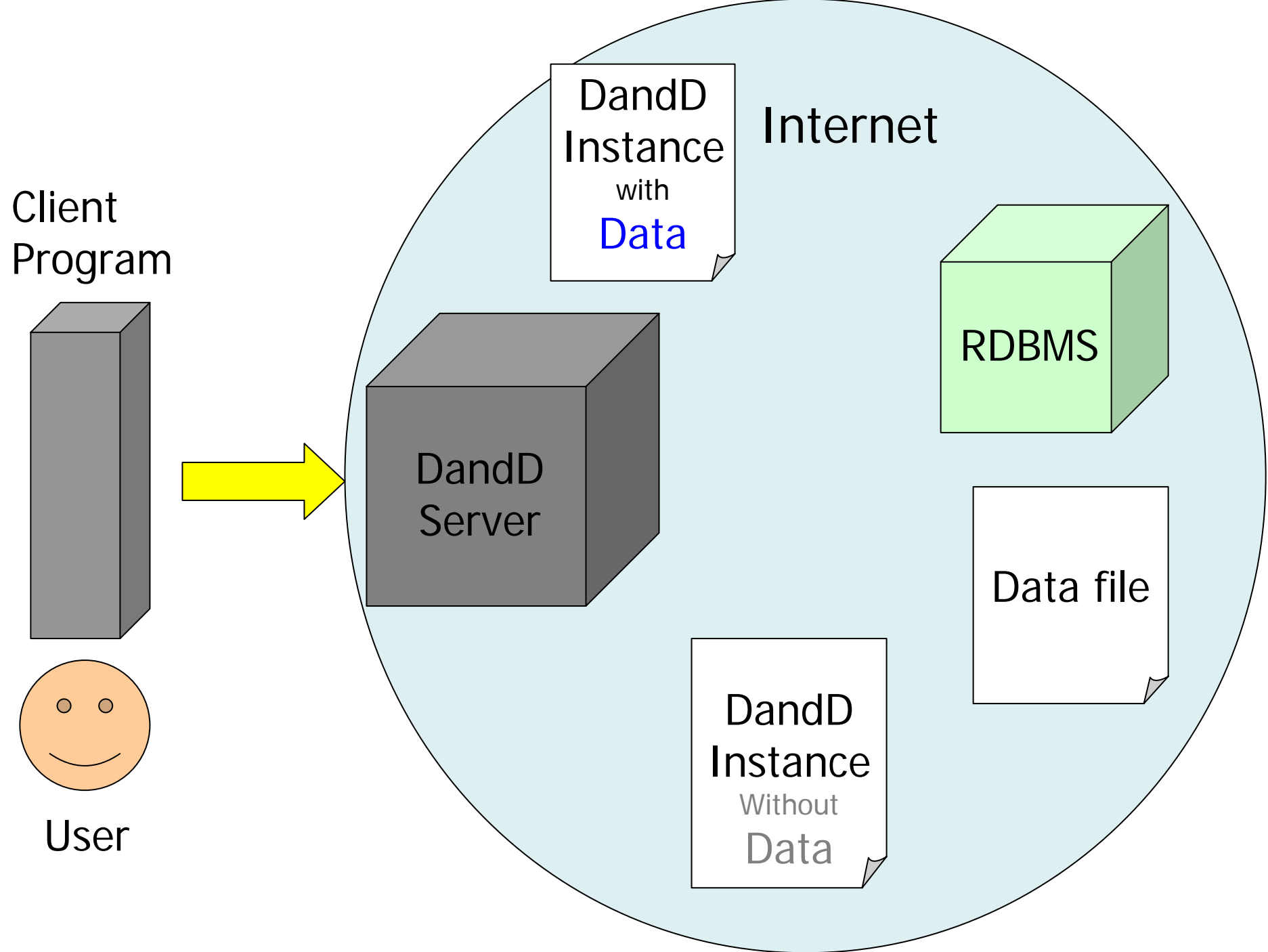


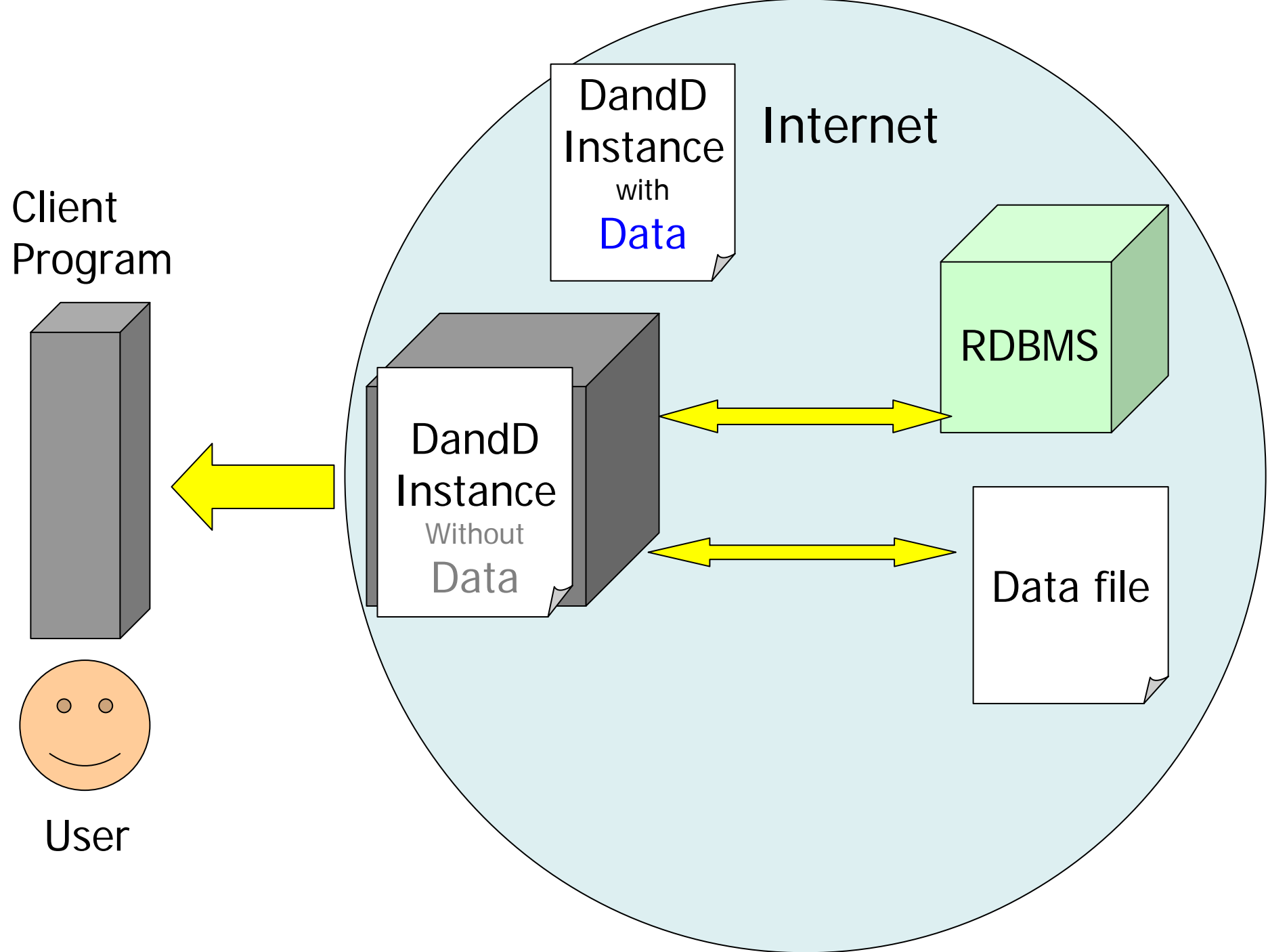
DataVector
(same length)



A piece of new Relational
data







Client Server System

- Easiness of Programming Support Software
 - Any language can be used as far as it supports socket handling.
- Flexibility
 - When DandD rule is modified, the client programs works as same as before, in most cases
- Mobility
 - The size of client program can be reduced, so it is installable on low ability machine like PDA or cellular phone.

DandD Server

- Recieve
 - DOM (Document Object Model) methods & Original methods
- Send
 - Flag + Size + String
- Implementation
 - Language
 - Java
 - API for XML documents
 - Xerces for Java2 (Apache Project)
 - Access to databases on the network
 - JDBC (Sun Micro Systems)
 - Interpreter
 - Pnuts (Sun Micro Systems)

DandD Client Programs

- DandDBrowser
 - For browsing a DandD instance
- DandDR
 - For analysis and modeling
- DandDGenerator
 - For creating and editing a DandD instance

DandD Browser

- Purpose
 - To help users to understand what kind of data are described in a DandD instance
- Implementation
 - Java Language

DandD Browser

DandDBrowser (Connected with DandDServer on yam.stat.math.keio.ac.jp)

File Option Help

LOAD STOP URL for DandD Instance <http://www.stat.math.keio.ac.jp/DandDIII/Examples/AcidRain.dad>

Acid Rain

- DandD
 - BackGround
 - Introduction
 - Reference
 - Sinya Seto, Mayumi Oohara, and Kosei Iwase
 - Data
 - Acid Rain**
 - V1
 - Sulfate Cocentration
 - V2
 - Nitrate Concentration
 - V3
 - Continuous Precipitation
 - DataBody
 - Sulfate Cocentration
 - Nitrate Concentration
 - Continuous Precipitation

Introduction

Continuous rainfall is rather subjectively defined. Duration of the continuous rainfall is not recorded. Observations are for days on which continuous rainfall is observed, from May of 1984 to May of 1988. Observation place "Shobara([Map](#))" is located in a basin surrounded by mountains with altitude 400-900m, and the altitude is 270m. Population of "Shobara" is approximately 23000 and there is no cause for pollution. The measuring instrument with the diameter 197mm is place on the top of a 10m high building.

Acid Rain

No.	V1	V2	V3
1	3 micro-gram/mili-liter	1.6 micro-gram/mili-liter	18 mili-meter/day
2	3.2 micro-gram/mili-liter	2.3 micro-gram/mili-liter	3.9 mili-meter/day
3	8.3 micro-gram/mili-liter	4.4 micro-gram/mili-liter	10.8 mili-meter/day
4	2.2 micro-gram/mili-liter	1.1 micro-gram/mili-liter	47.9 mili-meter/day
5	2.2 micro-gram/mili-liter	0.8 micro-gram/mili-liter	39.4 mili-meter/day
6	6.7 micro-gram/mili-liter	2.9 micro-gram/mili-liter	12.5 mili-meter/day
7	3.2 micro-gram/mili-liter	1.4 micro-gram/mili-liter	38.1 mili-meter/day
8	1 micro-gram/mili-liter	0.8 micro-gram/mili-liter	26.3 mili-meter/day
9	3.2 micro-gram/mili-liter	4.3 micro-gram/mili-liter	1 mili-meter/day
10	2.4 micro-gram/mili-liter	2.2 micro-gram/mili-liter	11.5 mili-meter/day
11	7.1 micro-gram/mili-liter	4 micro-gram/mili-liter	18 mili-meter/day
12	10.8 micro-gram/mili-liter	5.2 micro-gram/mili-liter	13.1 mili-meter/day
13	2.3 micro-gram/mili-liter	1.1 micro-gram/mili-liter	41.7 mili-meter/day
14	2.1 micro-gram/mili-liter	1.4 micro-gram/mili-liter	27.6 mili-meter/day
15	1.1 micro-gram/mili-liter	1 micro-gram/mili-liter	5.4 mili-meter/day
16	2 micro-gram/mili-liter	0.7 micro-gram/mili-liter	22.6 mili-meter/day
17	1.2 micro-gram/mili-liter	1.2 micro-gram/mili-liter	23.6 mili-meter/day
18	2.7 micro-gram/mili-liter	1 micro-gram/mili-liter	10.2 mili-meter/day
19	0.7 micro-gram/mili-liter	0.6 micro-gram/mili-liter	113.9 mili-meter/day
20	3.2 micro-gram/mili-liter	1.7 micro-gram/mili-liter	9.8 mili-meter/day
21	1.7 micro-gram/mili-liter	1.1 micro-gram/mili-liter	17.1 mili-meter/day
22	2 micro-gram/mili-liter	1.6 micro-gram/mili-liter	16.7 mili-meter/day
23	2.4 micro-gram/mili-liter	1.45 micro-gram/mili-liter	33.5 mili-meter/day

The Structure of DandD Instance

Progress 100%

Acid Rain

- DandD
 - BackGround
 - Introduction
 - Reference
 - Sinya Seto, Mayumi Oohara, and Kosei Iwase
 - Data
 - Acid Rain
 - V1 Sulfate Cocentration
 - V2 Nitrate Concentration
 - V3 Continuous Precipitation
- DataBody
 - Sulfate Cocentration
 - Nitrate Concentration
 - Continuous Precipitation

Body
Attribute

Popup Menu

Introduction

Continuous rainfall is rather subjectively defined. Duration of the continuous rainfall is not recorded. Observations are for days on which continuous rainfall is observed, from May of 1984 to May of 1988. Observation place "Shobara([Map](#))" is located in a basin surrounded by mountains. Population of "Shobara" is approximately 23000. A rain measuring instrument with the diameter 197mm is place on

Sulfate Cocentration

Id
sulfate

Length
196

Unit
micro-gram/mili-liter

VariableType
Continuous

Attributes of the node

	V2	V3
1	1.6 micro-gram/mili-liter	18 mili-meter/day
2	2.3 micro-gram/mili-liter	3.9 mili-meter/day
3	4.4 micro-gram/mili-liter	10.8 mili-meter/day
4	47.9 micro-gram/mili-liter	39.4 mili-meter/day
5	12.5 micro-gram/mili-liter	12.5 mili-meter/day
6	3.2 micro-gram/mili-liter	1.4 mili-meter/day
7	1 micro-gram/mili-liter	0.8 mili-meter/day
8	3.2 micro-gram/mili-liter	4.3 mili-meter/day
9	2.4 micro-gram/mili-liter	2.2 mili-meter/day
10	7.1 micro-gram/mili-liter	4 mili-meter/day
11	10.8 micro-gram/mili-liter	5.2 mili-meter/day
12	2.3 micro-gram/mili-liter	1.1 mili-meter/day
13	2.1 micro-gram/mili-liter	1.4 mili-meter/day
14	1.1 micro-gram/mili-liter	1 mili-meter/day
15		5.4 mili-meter/day

酸性雨

- DandD
 - BackGround
 - Introduction
 - Reference
 - Sinya Seto, Mayumi Oohara, and Kosei Iwase
 - Data
 - 酸性雨
 - V1 硫酸濃度
 - V2 硝酸濃度
 - V3 連続降雨量
 - DataBody
 - 硫酸濃度
 - 硝酸濃度
 - 連続降雨量

Introduction

連続降雨は気象学者の判断によって定義されているが、あまりはっきりとは定義されていない。ここでは、連続降雨のあった日だけの一日の降水量が連続降雨量として記録されている。データは広島県庄原(地図)で1984年の5月から1988年の5月までの間収集された。庄原は400-900m程の山に囲まれた盆地に位置し、その標高は270mである。また、人口は約23000人で大きな公害の原因となるものは無い。直径197mmの測定器は高さ10mの建物の屋上に配置した。

Language Selector

Language Selector

Please Select Language

Japanese

OK Cancel

酸性雨

No.	V1	V2	V3
1	3.2 マイクログラム/ミリ...	1.6 マイクログラム/ミリ...	18 ミリメートル/日
2	3.2 マイクログラム/ミリ...	2.3 マイクログラム/ミリ...	3.9 ミリメートル/日
3	8.3 マイクログラム/ミリ...	4.4 マイクログラム/ミリ...	10.8 ミリメートル/日
4	2.2 マイクログラム/ミリ...	1.1 マイクログラム/ミリ...	47.9 ミリメートル/日
5	2.2 マイクログラム/ミリ...	0.8 マイクログラム/ミリ...	39.4 ミリメートル/日
6	6.7 マイクログラム/ミリ...	2.9 マイクログラム/ミリ...	12.5 ミリメートル/日
7	3.2 マイクログラム/ミリ...	1.4 マイクログラム/ミリ...	38.1 ミリメートル/日
8	1.1 マイクログラム/ミリ...	0.8 マイクログラム/ミリ...	26.3 ミリメートル/日
9	3.2 マイクログラム/ミリ...	4.3 マイクログラム/ミリ...	1 ミリメートル/日
10	2.4 マイクログラム/ミリ...	2.2 マイクログラム/ミリ...	11.5 ミリメートル/日
11	7.1 マイクログラム/ミリ...	4 マイクログラム/ミリ...	18 ミリメートル/日
12	10.8 マイクログラム/ミ...	5.2 マイクログラム/ミリ...	13.1 ミリメートル/日
13	2.3 マイクログラム/ミリ...	1.1 マイクログラム/ミリ...	41.7 ミリメートル/日
14	2.1 マイクログラム/ミリ...	1.4 マイクログラム/ミリ...	27.6 ミリメートル/日
15	1.1 マイクログラム/ミリ...	1 マイクログラム/ミリ...	5.4 ミリメートル/日
16	2 マイクログラム/ミリ...	0.7 マイクログラム/ミリ...	22.6 ミリメートル/日
17	1.2 マイクログラム/ミリ...	1.2 マイクログラム/ミリ...	23.6 ミリメートル/日
18	2.7 マイクログラム/ミリ...	1 マイクログラム/ミリ...	10.2 ミリメートル/日
19	0.7 マイクログラム/ミリ...	0.6 マイクログラム/ミリ...	113.9 ミリメートル/日
20	3.2 マイクログラム/ミリ...	1.7 マイクログラム/ミリ...	9.8 ミリメートル/日

DandDBrowser (Connected with DandDServer on yam.stat.math.keio.ac.jp)

File Option Help

LOAD STOP URL for DandD Instance <http://www.stat.math.keio.ac.jp/DandDIII/Examples/AcidRain.dad>

Acid Rain

- DandD
 - BackGround
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 - Data
 - Acid Rain**
 - V1
 - Sulfate Cocentration
 - V2
 - Nitrate Concentration
 - V3
 - Continuous Precipitation
 - DataBody
 - Sulfate Cocentration
 - Nitrate Concentration
 - Continuous Precipitation

Acid Rain

Introduction

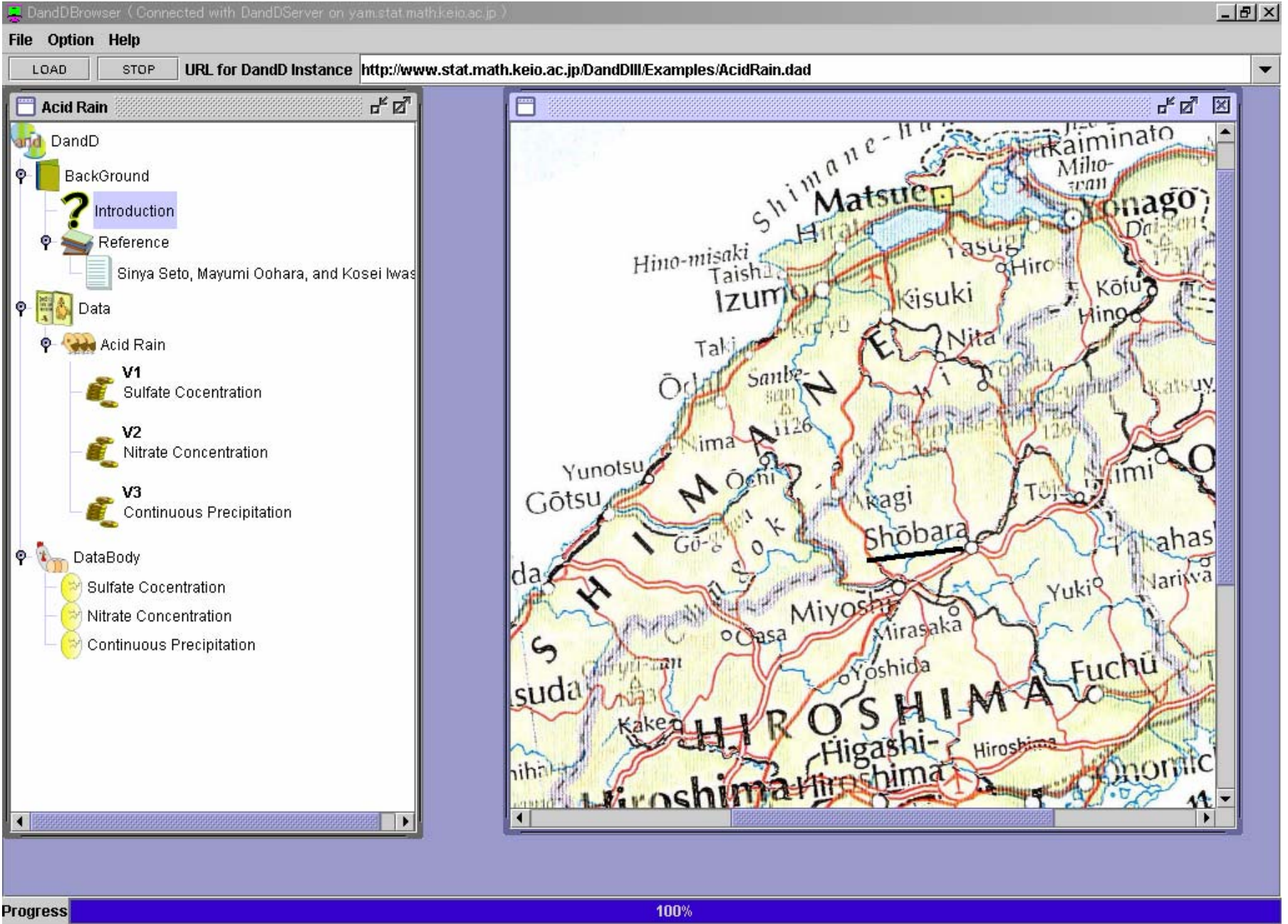
Continuous rainfall is rather subjectively defined. Duration of the continuous rainfall is not recorded. Observations are for days on which continuous rainfall is observed, from May of 1984 to May of 1988. Observation place "Shobara([Map](#))" is located in a basin surrounded by mountains with altitude 400-900m, and the altitude is 270m. Population of "Shobara" is approximately 23000 and there is no cause for pollution. The measuring instrument with the diameter 197mm is place on the top of a 10m high building.

Link for an auxiliary material of introduction

Acid Rain

No.			
1	3 micro		ay
2	3.2 mic		day
3	8.3 micro-gram/mili-liter	4.4 micro-gram/mili-liter	10.8 mili-meter/day
4	2.2 micro-gram/mili-liter	1.1 micro-gram/mili-liter	47.9 mili-meter/day
5	2.2 micro-gram/mili-liter	0.8 micro-gram/mili-liter	39.4 mili-meter/day
6	6.7 micro-gram/mili-liter	2.9 micro-gram/mili-liter	12.5 mili-meter/day
7	3.2 micro-gram/mili-liter	1.4 micro-gram/mili-liter	38.1 mili-meter/day
8	1 micro-gram/mili-liter	0.8 micro-gram/mili-liter	26.3 mili-meter/day
9	3.2 micro-gram/mili-liter	4.3 micro-gram/mili-liter	1 mili-meter/day
10	2.4 micro-gram/mili-liter	2.2 micro-gram/mili-liter	11.5 mili-meter/day
11	7.1 micro-gram/mili-liter	4 micro-gram/mili-liter	18 mili-meter/day
12	10.8 micro-gram/mili-liter	5.2 micro-gram/mili-liter	13.1 mili-meter/day
13	2.3 micro-gram/mili-liter	1.1 micro-gram/mili-liter	41.7 mili-meter/day
14	2.1 micro-gram/mili-liter	1.4 micro-gram/mili-liter	27.6 mili-meter/day
15	1.1 micro-gram/mili-liter	1 micro-gram/mili-liter	5.4 mili-meter/day
16	2 micro-gram/mili-liter	0.7 micro-gram/mili-liter	22.6 mili-meter/day
17	1.2 micro-gram/mili-liter	1.2 micro-gram/mili-liter	23.6 mili-meter/day
18	2.7 micro-gram/mili-liter	1 micro-gram/mili-liter	10.2 mili-meter/day
19	0.7 micro-gram/mili-liter	0.6 micro-gram/mili-liter	113.9 mili-meter/day
20	3.2 micro-gram/mili-liter	1.7 micro-gram/mili-liter	9.8 mili-meter/day
21	1.7 micro-gram/mili-liter	1.1 micro-gram/mili-liter	17.1 mili-meter/day
22	2 micro-gram/mili-liter	1.6 micro-gram/mili-liter	16.7 mili-meter/day
23	2.4 micro-gram/mili-liter	1.45 micro-gram/mili-liter	33.5 mili-meter/day

Progress 100%



The function of the link is implemented by using “Unparsed Entity” equipped in XML originally.

LOA

Reference

- Sinya Seto, Mayumi Oohara, and Kosei Iwasa

Data

Acid Rain

- V1 Sulfate Cocentration
- V2 Nitrate Concentration
- V3 Continuous Precipitation

DataBody

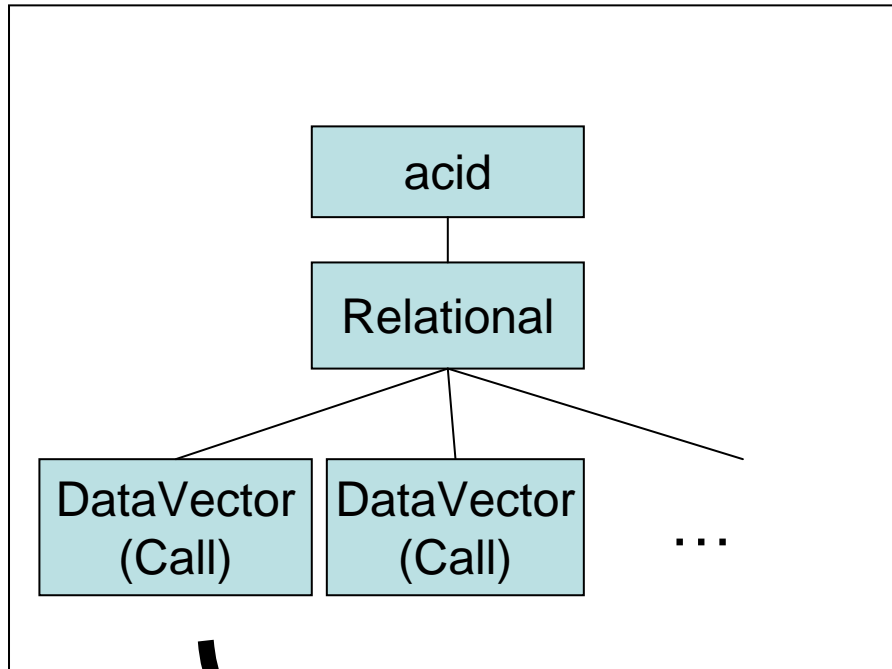
- Sulfate Cocentration
- Nitrate Concentration
- Continuous Precipitation



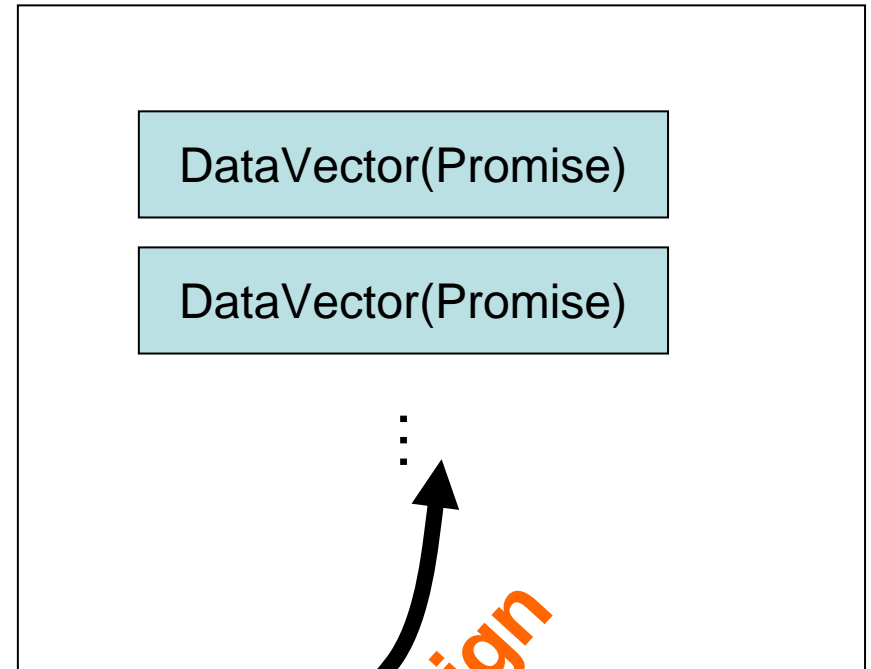
DandDR

- Purpose
 - To support data analysis and modeling
 - An Interface between DandDServer and R
- Implementation
 - C language
 - Iconv (GNU)

.GlobalEnv



Position 2



delay

delay(eval(DataVector))

assign

```
> library(dad)
> acid=DandD()
> acid #`print.dad` is called
```

DandDGenerator

- Purpose
 - Creating and editing DandD instance
- Implementation
 - Java language
- Feature
 - Various templates of DandD instance.
 - Interface to a relational database system

DandDGenerator

The screenshot displays the DandDGenerator application interface with several key components:

- Structure Panel:** A tree view on the left showing the hierarchy of the DandD instance, including folders like BackGround, Data, Relational, DataBody, and Appendix, with sub-items like DataVector and Access.
- XML View:** A central panel showing the XML representation of the selected structure, with a callout box stating: "A tree structure of the DandD instance".
- SQL Viewer:** A panel on the right showing a SQL query: "select second from kobequake" and its execution results in a table.
- Database Control Panel:** A panel at the bottom left with buttons for "Database", "Table & Column", and "SQL". A callout box points to the "Table & Column" button, labeling it as the "OUTPUT BUTTON".
- Table & Column Dialog:** A dialog box at the bottom center showing a list of columns for the "kobequake" table, including year, month, day, hour, minute, second, essecond, latitude, and longitude.

No.	second
1	51.8
2	14.6
3	35.1
4	48.8
5	23.9
6	5.2
7	47.5
8	7.3
9	40.2
10	11.6
11	4.1
12	30.2
13	5.8

Table(select by double click)	Column
kobequake	year
	month
	day
	hour
	minute
	second
	essecond
	latitude
	latiminate
	latieminute
	longdegree
	longminute
	longeminute

DandDGenerator

The screenshot displays the DandDGenerator application interface. On the left is a 'Structure' tree showing a project named 'DandD' with sub-items like 'BackGround', 'Data', 'Relational rel2', 'DataBody', 'Appendix', and 'Protocol prt206'. Below this is an 'OUTPUT' section and a 'Database Control' panel with buttons for 'Database', 'Table & Column', and 'SQL'. The main window is divided into three panes: 1. 'XML Data' pane showing an XML document with a root element '<Data>' containing a '<Relational Id="rel2066517378">' element and several '<Value RefId="...">' elements. A 'SAVE' button is at the bottom. 2. 'SQL Viewer' pane showing a query 'select second from kobequake' and its results in a table with columns 'No.' and 'second'. The results are: (1, 51.8), (2, 14.6), (3, 35.1), (4, 48.8), (5, 23.9), (6, 5.2), (7, 47.5), (8, 7.3), (9, 40.2), (10, 11.6), (11, 4.1), (12, 30.2), (13, 5.8). 3. 'Table & Column' dialog box for the table 'kobequake', listing columns: 'year', 'month', 'lateminute', 'longdegree', 'longminute', 'longeminute'. It has buttons for 'as DataVector', 'as Relational Data', and 'CANCEL'. A light blue callout box with a pointer to the dialog box contains the text: 'Concrete description of the DandD instance'. The status bar at the bottom reads 'DandDServer : yam / Database : KobeQuake on ginger'.

Concrete description of the DandD instance

DandDGenerator

The screenshot displays the DandDGenerator application interface. A callout box labeled "Database Control Window" points to the "Database Control" button in the left sidebar. The main window is divided into several panes:

- Structure:** A tree view showing the project hierarchy: DandD > BackGround > Data > Relational rel2 > DataBody > DataVector dv2.
- Code Editor:** Contains XML-like code for a relational data structure, including tags like <Data>, <Relational Id="rel2066517378">, <Value RefId="dv2066517378"/>, </Relational>, </Data>, and <DataBody>.
- SQL Viewer:** Shows a SQL query: "select second from kobequ:" and an "execute" button. Below the query is a table with 13 rows of data.
- Table & Column:** A dialog box for selecting a table and columns. The table "kobequake" is selected, and the "second" column is highlighted. Buttons at the bottom include "as DataVector", "as Relational Data", and "CANCEL".

At the bottom of the application window, the status bar reads: "DandDServer : yam / Database : KobeQuake on ginger".

No.	second
1	51.8
2	14.6
3	35.1
4	48.8
5	23.9
6	5.2
7	47.5
8	7.3
9	40.2
10	11.6
11	4.1
12	30.2
13	5.8

DandDGenerator

The screenshot displays the DandDGenerator application interface. On the left, a 'Structure' tree shows a project named 'DandD' with sub-items like 'BackGround', 'Data', 'Relational rel2', 'DataBody', 'Appendix', and 'Protocol prt206'. Below this is a 'Database Control' panel with buttons for 'Database', 'Table & Column', and 'SQL'. The main window is divided into several panes:

- XML Data Pane:** Displays XML content for a relational table. It includes a header row: `<Data>`, `<Relational Id="rel2066517378">`, and a series of `<Value RefId="dv2066517378"/>` elements. Below this is a `</Relational>` tag, a `</Data>` tag, and a `<DataBody>` section containing multiple `<DataVector Access="acc2066517378" Id="dv2066517378" Protocol="prt2066517378">` elements.
- SQL Viewer Pane:** Shows a SQL query: `select second from kobequake`. Below the query is a table with two columns: 'No.' and 'second'. The table contains 13 rows of data.
- Table & Column Pane:** Shows a table named 'kobequake' with a list of columns: year, month, day, hour, minute, second, essecond, latitude, latiminate, latieminute, longitude, longminute, and longeminute. The 'second' column is highlighted in blue.

At the bottom of the 'Table & Column' pane, there are three buttons: 'as DataVector', 'as Relational Data', and 'CANCEL'. The 'as Relational Data' button is highlighted with a red box. A callout bubble points to this button with the text 'As Relational BUTTON'. Another callout bubble points to the 'second' column in the table with the text 'Columns of the table'. A third callout bubble points to the 'Table(select by double click)' header in the 'Table & Column' pane with the text 'Table in the relational database'. The status bar at the bottom reads 'DandDServer : yam / Database : KobeQuake on ginger'.

No.	second
1	51.8
2	14.6
3	35.1
4	48.8
5	23.9
6	5.2
7	47.5
8	7.3
9	40.2
10	11.6
11	4.1
12	30.2
13	5.8

DandDGenerator

The screenshot displays the DandDGenerator application interface. On the left is the **Structure** panel showing a tree view of the project hierarchy. The main area is divided into three panels:

- SQL Viewer**: Shows the XML representation of the data and a table of results. A red box highlights the **SQL Query** field containing "select second from kobequ:" and the **execute** button.
- Table & Column**: Shows a list of columns for the "kobequake" table, including year, month, day, hour, minute, second, essecond, latitude, and longitude. A callout points to the **SQL Query** field in the SQL Viewer panel, stating "Text field for inputting SQL query".

Below the SQL Viewer panel is an **OUTPUT** section and a **Database Control** section with buttons for Database, Table & Column, and SQL.

No.	second
1	51.8
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Homepage

- DandD Project Homepage
 - DandD Support Software
 - Examples of DandD instance
 - DTD
- URL

<http://www.stat.math.keio.ac.jp/DandD/>