

Homework 2-Part 1: Class Project (2 <sup>nd</sup> Submission – Final)	
Project Use Cases: Define a dataset, Upload a complete dataset, Append data to existing dataset, Define dataset visualization, Visualize a dataset	Date: 14/June/18
Group 2: Akshay Jayakumar, Francis Obiagwu, Kari Fallos, Keith Aubin, Justin Buckley, Sneha Bharat	

# Data Visualization and Storage Application

## Use-Case: Define a dataset

### 1 Brief Description

This use case describes how the user defines a new dataset definition.

### 2 Actor Brief Descriptions

#### 2.1 User

#### 2.2 Server

### 3 Preconditions

User has opened their browser and navigated to the data visualization and storage website.

The server is available and hosting the data visualization and storage website.

The server provides persistent storage to store datasets.

### 4 Basic Flow of Events

1. The use case begins when the user can access the different alternatives (see Supporting Requirement SR-1 for a list of alternatives.) available to the website. In this case, the user always selects “Define a Dataset”.
2. The website prompts for new dataset (see special requirements for details describing a dataset and data definition).
3. The user enters a dataset name.
4. The user enters a data definition attribute.
5. The user chooses to add the new definition attribute to the data definition.
6. The user continues steps 4 & 5 until all desired attributes have been defined
7. The dataset name and the data definition attributes names, types and limits are sent to the Server as a single bundle for storage. The Server replies with a reference to the newly defined dataset.
8. The website displays the dataset definition.
9. The use case ends.

### 5 Alternative Flows

#### 5.1 Attribute name is invalid or existing

If in step 6 of the basic flow, the user enters an attribute name that is empty or already exists, then

1. The users informed that the attribute name requires modification.
2. Upon modification, the use case may continue from step 6 normally.

#### 5.2 No response from Server

If in step 1 of the basic flow cannot access the websites alternative options, then

1. The users informed that the data point name requires modification.
2. The use case ends with a failure condition.

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## 6 Subflows

### 6.1 Describe a new dataset

1. User names the dataset using a descriptive name
2. User adds one or more attributes to the dataset definition.

### 6.2 Describe attribute

1. User names attribute using a unique name
2. User selects attribute type
3. User enters any required bounding values

## 7 Key Scenarios

### 7.1 No response from Server

### 7.2 Dataset name is invalid or existing

### 7.3 Attribute name is invalid or existing

## 8 Post-conditions

### 8.1 New Dataset present in system for tracking

## 9 Special Requirements

[SR-1] The website shall provide dataset management alternatives to “Define a Dataset”, “Upload a Dataset”, “Append to an Existing Dataset” and “Visualize a Dataset”.

[DD-2] A dataset shall have a name

[DD-3] A dataset shall include a data definition.

[DD-4] A dataset shall include zero or more data samples (ADED-1).

[DD-5] A dataset definition consist of one or more data attributes.

[DD-6] A data definition attribute shall have a name unique within the dataset.

[DD-7] A data definition attribute shall have a type.

[DD-8] A data definition attribute type shall be floating-point, integer, arbitrary, or enumerated.

[DD-9] A data definition attribute with the floating-point number type shall define upper and lower limits.

[DD-10] A data definition data attribute with the integer number type shall define upper and lower limits.

[DD-11] A data definition data attribute with the arbitrary type shall not define any limits.

[DD-12] A data definition data attribute with the enumeration type shall define allowed values with a comma separated string.

## Use-Case: Append data sample to existing dataset

### 1 Brief Description

This use case describes how the user appends a new data sample to an existing dataset.

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## 2 Actor Brief Descriptions

### 2.1 User

### 2.2 Server

## 3 Preconditions

User has opened their browser and navigated to the data visualization and storage website.

The server is available and hosting the data visualization and storage website.

The server provides persistent storage that includes existing datasets.

## 4 Basic Flow of Events

1. The use case begins when the user can access the different alternatives (see Supporting Requirement SR-1 for a list of alternatives.) available to the website. In this case the user always selects “Append to Existing Dataset”
2. The website displays a list of existing datasets.
3. User selects a single dataset from a list of datasets provided by the server.
4. The website displays existing data samples within the chosen dataset.
5. The website displays a prompt allowing the user to enter or choose values for every attribute in the dataset (see special requirements for details for entering values for a data sample).
6. The user enters values for all attributes.
7. The user presses a button to append the sample to the dataset
8. The values chosen are sent to the Server for storage within the chosen dataset as a new data sample. The Server replies with the latest version of the datasets samples.
9. The website displays the latest version of the dataset samples.
10. The use case ends.

## 5 Alternative Flows

### 5.1 Datasets do not exist on the server

If in step 2 of the basic flow, the server does not have one or more existing datasets, then

1. The website does not display any data.
2. The use case ends.

### 5.2 Sample value assignment is invalid

If in step 6 of the basic flow, the user enters a value which is out of bounds for its attribute

1. The user is informed that the value requires modification.
2. Upon modification, the use case may continue from step 6 normally.

## 6 Subflows

### 6.1 Describe a new data sample

1. User enters a single data point to create a new data sample
2. User adds additional data points, which are appended to the data sample.

### 6.2 Describe data point

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1. User names data point using a unique name
2. User selects data point attribute type, providing attribute type value and or limits (when floating-point or integer)

## **7 Key Scenarios**

### **7.1 No response from Server**

### **7.2 Sample data point name is invalid or existing**

## **8 Post-conditions**

### **8.1 Data added to Dataset and present in system for tracking**

## **9 Special Requirements**

[ADED-1] A data sample consists of value assignments for all attributes defined in a dataset

[ADED-2] All value assignments must conform to the type and limits defined by the matching attribute

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## Use-Case: Upload a dataset

### 1 Brief Description

This use case describes how the user uploads a local file to create a new dataset.

### 2 Actor Brief Descriptions

#### 2.1 User

#### 2.2 Server

### 3 Preconditions

User has opened their browser and navigated to the data visualization and storage website.

The server is available and hosting the data visualization and storage website.

The server provides persistent storage that includes existing datasets.

### 4 Basic Flow of Events

1. The use case begins when the user can access the different alternatives (see Supporting Requirement SR-1 for a list of alternatives.) available to the website. In this case the user always selects “Upload a Dataset”
2. The website displays a list of existing datasets.
3. The website prompts user to upload a dataset file (see special requirements for details describing permissible dataset file formats).
4. The user enters a dataset name.
5. The dataset names sent to the Server for validation as a unique dataset. The Server replies permitting file upload UI to enable.
6. The user chooses a file from the file system.
7. The chosen file and unique dataset names sent to the Server for storage within a new dataset. The Server replies with a listing of available datasets containing the new dataset. The website displays the list of datasets.
8. The website displays a list of existing datasets including the newly added dataset.
9. The use case ends.

### 5 Alternative Flows

#### 5.1 Datasets do not exist on the server

If in step 2 of the basic flow, the server does not have one or more existing datasets, then

1. The website does not display any data.
2. The use case ends.

#### 5.2 Dataset name is invalid or existing

If in step 4 of the basic flow, the user enters a dataset name that is empty or already exists, then

1. The users informed that the dataset name requires modification.
2. Upon modification, the use case may continue from step 4 normally.

#### 5.3 No response from Server

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If in step 1 of the basic flow cannot access the websites alternative options, then

1. The users informed that the data point name requires modification.
2. The use case ends with a failure condition.

## **6 Subflows**

## **7 Key Scenarios**

### **7.1 No response from Server**

### **7.2 Dataset name is invalid or existing**

## **8 Post-conditions**

### **8.1 New Dataset present in system for tracking**

## **9 Special Requirements**

[FF-1] The site shall permit the upload of a single Excel file format XLS as a new dataset.

[FF-2] The site shall permit the upload of a single Excel file format XLSX as a new dataset.

[FF-3] The site shall permit the upload of a single comma delimited file format (CSV) as a new dataset.

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## Use-Case: Visualize a Dataset

### 1 Brief Description

This use case describes how the user can visualize an existing dataset.

### 2 Actor Brief Descriptions

#### 2.1 User

#### 2.2 Server

### 3 Preconditions

User has opened their browser and navigated to the data visualization and storage website.

The server is available and hosting the data visualization and storage website.

The server provides persistent storage that includes existing datasets.

### 4 Basic Flow of Events

1. The use case begins when the user can access the different alternatives (see Supporting Requirement SR-1 for a list of alternatives) available to the website. In this case the user always selects “Visualize Dataset”
2. The website displays a list of existing visualizations.
3. The website prompts user to select visualization (see special requirements for details describing visualization options).
4. The user selects existing visualization.
5. The visualization and requested visualization method sent to the Server. The Server replies with visualization data. The website displays the Server provided visualization data.
6. The use case ends.

### 5 Alternative Flows

#### 5.1 Visualizations do not exist on the server

If in step 2 of the basic flow, the server does not have one or more existing datasets, then

1. The website does not display any data.
2. The use case ends.

#### 5.2 No response from Server

If in step 1 of the basic flow cannot access the websites alternative options, then

1. The users informed that the data point name requires modification.
2. The use case ends with a failure condition.

### 6 Subflows

### 7 Key Scenarios

#### 7.1 No response from Server

### 8 Post-conditions

#### 8.1 New Dataset present in system for tracking

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## 9 Special Requirements

[VisScatter-1] The server shall provide a scatter plot visualization.

[VisSeries-1] The server shall provide an indexed series visualization.

[VisHistogram-1] The server shall provide a histogram visualization.

[Vis-1] The server shall provide existing visualizations.



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## Use-Case: Define Dataset Visualization

### 1 Brief Description

This use case describes how the user can visualize an existing dataset.

### 2 Actor Brief Descriptions

#### 2.1 User

#### 2.2 Server

### 3 Preconditions

User has opened their browser and navigated to the data visualization and storage website.

The server is available and hosting the data visualization and storage website.

The server provides persistent storage that includes existing datasets.

### 4 Basic Flow of Events

1. The use case begins when the user can access the different alternatives (see Supporting Requirement SR-1 for a list of alternatives) available to the website. In this case the user always selects “Define Dataset Visualization”
2. The website displays a list of existing datasets.
3. The website prompts user to select a dataset for visualization (see special requirements for details describing visualization options).
4. The user selects existing visualization.
5. The users prompted to name the visualization.
6. The users names the visualization.
7. The users prompted to select a visualization type.
8. The user selects the visualization type.
9. The users prompted to provide options required by the chosen visualization type.
10. The user provides visualization type options.
11. The visualization name, type and type options sent to the Server. The Server replies with updated list of available visualizations. The website displays the Server provided visualizations.
12. The use case ends.

### 5 Alternative Flows

#### 5.1 Datasets do not exist on the server

If in step 2 of the basic flow, the server does not have one or more existing datasets, then

1. The website does not display any data.
2. The use case ends.

#### 5.2 No response from Server

If in step 1 of the basic flow cannot access the websites alternative options, then

1. The users informed that the data point name requires modification.

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2. The use case ends with a failure condition.

### 5.3 Visualization name is invalid or existing

If in step 6 of the basic flow, the user enters a visualization name that is empty or already exists, then

1. The users informed that the visualization name requires modification.
2. Upon modification, the use case may continue from step 6 normally.

### 5.4 Visualization options are invalid

If in step 10 of the basic flow, the user enters visualization options that is invalid, then

1. The users informed that the invalid visualization option requires modification.
2. Upon modification, the use case may continue from step 10 normally.

## 6 Subflows

## 7 Key Scenarios

### 7.1 No response from Server

### 7.2 Visualization name is invalid or existing

### 7.3 Visualization options are invalid

## 8 Post-conditions

### 8.1 New Dataset present in system for tracking

## 9 Special Requirements

[VisScatter-2] The scatter plot visualization shall include an attribute that describes the x-axis.

[VisScatter -3] The scatter plot visualization shall include an attribute that describes the y-axis.

[VisHistogram-2] The histogram plot visualization shall include an attribute that describes the data.

[VisSeries-2] The series plot visualization shall include an attribute that describes the data.