PUBLIC SAFETY

CHICAGO PUBLIC SAFETY

TEAM 21

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CSP 586 FINAL UML PROJECT

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Chapter 1 Business Statement

Description: The City of Chicago continues to use each tool at its disposal to create the streets, sidewalks, Educational Institutions and parks safe for all residents. like all major Cities, targeted efforts to decrease criminal incidents and vulnerabilities area unit vital challenges. within the years to come back, gathering intelligence and observation criminal activity can still be crucial for the fast detection and potential hindrance of incidents and crime patterns. continued to strengthen partnerships between town departments, notably Police, Fire, and workplace of Emergency Management and Communications, and local, state, and Federal partners is additionally vital to the City's in progress public safety strategy. Improve Chicago's safety and state. give public safety personnel with supplementary tools to extend public safety and state efforts. Increase crime fighting efforts in high crime areas by getting vehicles to switch Associate in Nursing aging fleet, getting in-car cameras for police vehicles to extend the security of the officers and the public, and adding extra resources in high crime areas over time.

Public safety Data helps responders seeking to maximize their in-operation potency providing them with a range of tools to use at their fingertips. By integration records management, emergency decision systems, map-based modules and a lot of, apps permit public safety personnel to possess a immensely larger in operation image to figure from.

Chapter 2 Feature List

The following are the primary features of the system:

- View Dataset: The user selects the view data on the Dashboard. The system displays five view dataset options: crime prior to one year data, fire station data, life safety evaluations data, police station data and public health service data. The user selects any one of the options from the five options. System displays the selected page to the user in the Dashboard. This use-case is divided into five sub use-cases based on the selection of the view datatype by the user. The five sub-cases are described below as crime prior to one year data, fire station data, life safety evaluations data, police station data and public health service data.

- Plot Dataset: The user selects the view data on the Dashboard. The system displays five view dataset options: crime prior to one year data, fire station data, life safety evaluations data, police station data and public health service data. The user selects any one of the options from the five options. System displays the selected page to the user in the Dashboard. User now clicks on the Line Chart option from the view dataset page. System now displays a Line Chart basing on the selection corresponding dataset. Users can choose five different Plots line charts, pie, pivot, stacked bar chart .

- Export dataset: The system displays five dataset options: crime prior to one year data, fire station data, life safety evaluations data, police station data and public health service data. The user selects any one of the options from the five options. User clicks on export button and dataset is exported in CSV or JSON format. This use-case is divided into five sub use-cases based on the selection of the view datatype by the user. The five sub-cases are described below as crime prior to one year data, fire station data, life safety evaluations data, police station data and public health service data.

- Filter Dataset: The system displays five dataset options: crime prior to one year data, fire station data, life safety evaluations data, police station data and public health service data. The user selects any one of the options from the five options. User clicks on filter button and dataset is filter. User can use filter by row or filter by condition. This use-case is divided into five sub use-cases based on the selection of the view datatype by the user. The five sub-cases are described below as crime prior to one year data, fire station data, life safety evaluations data, police station data and public health service data.

❖ **User Related Features**

I. View Dataset:
   1. User Logs on to the dashboard
   2. User clicks on Crime data.
   3. User clicks on Fire station data
   4. User clicks on Life safety evaluations data
   5. User clicks on Police station data

6. User clicks on Health data
7. User ends the order

II. Plot Dataset

1. User Logs on to the dashboard
2. User selects a dataset
3. User selects Line, Pie, Polar, Doughnut or Bar Chart on Crime dataset.
4. User selects Line, Pie, Polar, Doughnut or Bar Chart on Fire station data
5. User selects Line, Pie, Polar, Doughnut or Bar Chart on Life safety evaluations data
6. User selects Line, Pie, Polar, Doughnut or Bar Chart on Police station data
7. User selects Line, Pie, Polar, Doughnut or Bar Chart on Health data

III. Export Dataset:

1. User logs on to the dashboard
2. User chooses dataset
3. User clicks on export button
4. User selects the format
5. User log off

IV. Filter Dataset

1. User logs on to the dashboard
2. User chooses dataset
3. User clicks on filter button
4. User selects filter by row or condition or select by column
5. User log off

Chapter 3 List of Requirements

a) Dashboard must make use of Chart.js and Dataframe.js for plotting and creation of tables respectively.
b) User should be able to open the dashboard by Logging on the webpage.
c) User should be able to view dataset on the dashboard.
d) User should be able to click on Crime data.

e) User should be able to click on Fire station data.
f) User should be able to click on Police station data.
g) User should be able to click on Health data.
h) User should be able to click on Life safety evaluations data.
i) User should be able to selects Line, Pie, Polar, Doughnut or Bar Chart on Crime data.
j) User should be able to selects Line, Pie, Polar, Doughnut or Bar Chart on Fire station data.
k) User should be able to selects Line, Pie, Polar, Doughnut or Bar Chart on Life safety evaluations data.
l) User should be able to selects Line, Pie, Polar, Doughnut or Bar Chart on Police station data.
m) User should be able to selects Line, Pie, Polar, Doughnut or Bar Chart on Health data.
n) User must be able to select other plots as well.
o) User should be able to export datasets in CSV or JSON format.
p) User should be able to filter data by row and condition.

Chapter 4 List of Use Cases

1. View Dataset

This use case can be briefly described as the one which describes on how to view the Data set. This consists of five Sub Use cases which describes of the five available Datasets.

2. Plot Line Chart for Datasets

This Use case deals with the plotting of Line chart for five data sets.

3. Plot Bar Chart for Datasets

This Use case deals with the plotting of Bar chart for five data sets.

4. Plot Pie Chart for Datasets

This Use case deals with the plotting of Pie chart for five data sets.

5. Plot Polar Area Chart for Datasets

This Use case deals with the plotting of Polar chart for five data sets.

6. Plot Doughnut Chart for Datasets

This Use case deals with the plotting of Doughnut chart for five data sets.

7. Export Datasets as CSV or JSON formats

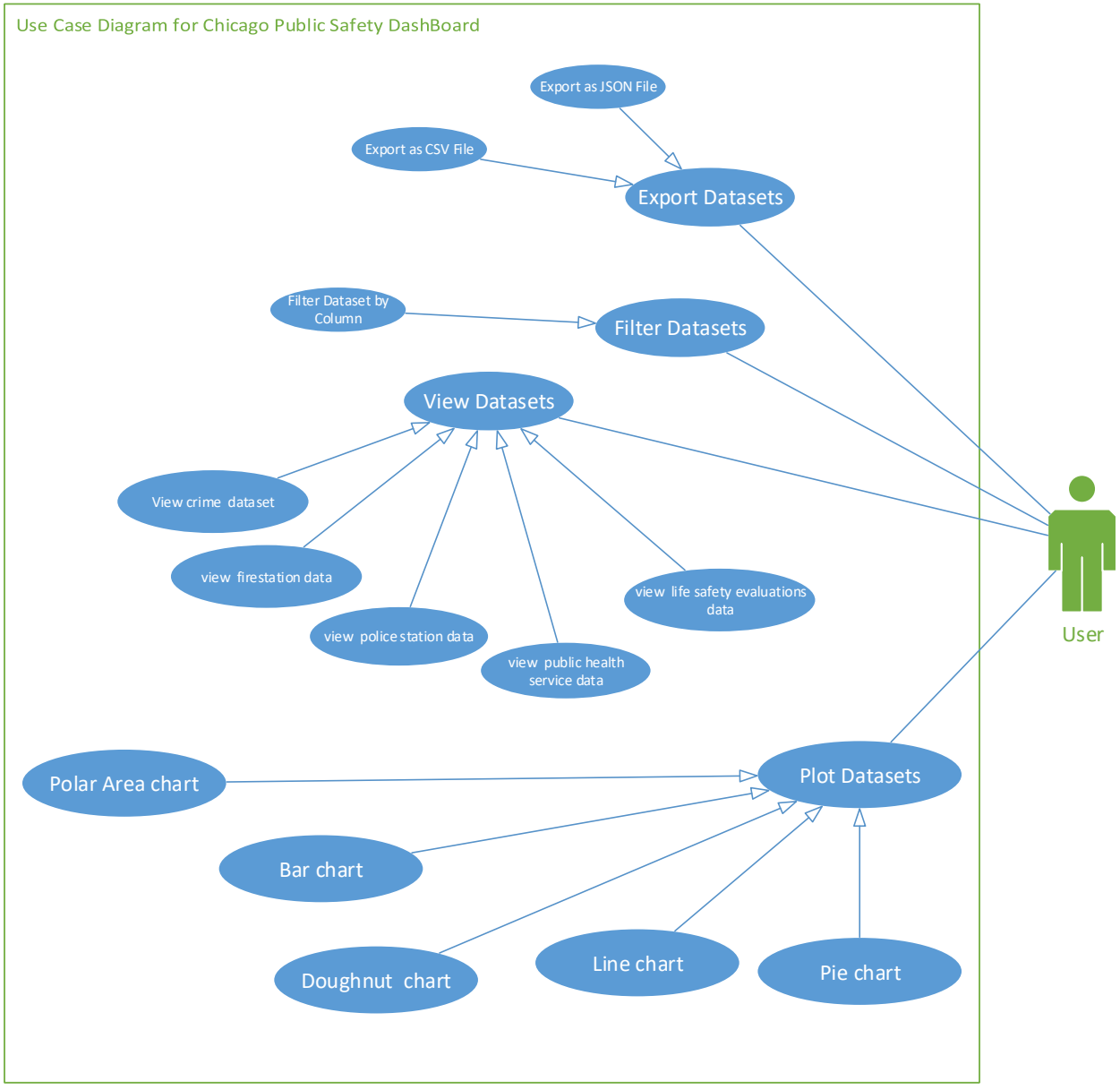
This Use Case Describes the exporting of the Data Sets in CSV or JSON formats.

8. Filter Data by condition and select Data by Column

This Use Case deals with the filtering of the Data Set according to the Specifications.

Chapter 5 Use Case Diagram

The following is the Use Case Diagram for the Project.



Chapter 6 Use Case Text (Fully Dressed)

1. Use case 1

View Dataset

Use Case Name:	View Dataset
Scenario:	Dashboard must display the Selected Datasets
Triggering Event:	User clicks on view data to view various Datasets
Brief Description:	The user selects the view data on the Dashboard. The system displays five view dataset options: crime data, fire station data, life safety evaluations data, police station data and public health service data. The user selects any one of the options from the five options. System displays the selected page to the user in the Dashboard. This use-case is divided into five sub use-cases based on the selection of the view datatype by the user. Each data set uses Dataframe.js for creating tables and filtering them dynamically.
Actors:	User (Primary)
Related Use Cases:	Export Datasets, Plot Dataset
Stakeholders:	*User*: wants to view selected Dataset
Preconditions:	1. User should be logged on to the Dashboard 2. Dashboard must have been updated with the latest data for individual datasets
Post conditions:	1. Crime data must be displayed if corresponding selection is made. 2. Fire station data must be displayed if corresponding selection is made. 3. Life safety evaluations data must be displayed if corresponding selection is made. 4. Police station data must be displayed if corresponding selection is made. 5. Public health service data must be displayed if corresponding selection is made.

Flow of Events:	**User (actor)**	**System**
1. User Logs on to the dashboard 2. User clicks on Crime prior to one year option 3. User clicks on Fire station data 4. User clicks on Life safety evaluations data 5. User clicks on Police station data 6. User clicks on Health data 7. User ends the order		1.1 Displays Dashboard Homepage 2.1 Displays Crime prior to one year details on the page 3.1 Displays Fire station details on the page 4.1 Displays Life Safety Evaluations details on the page 5.1 Displays Police station details on the page 6.1 Displays Health details on the page

2. Use Case 2

   Plot Line chart

Use Case Name:	Plot Dataset as Line chart
Scenario:	Dashboard must plot the Selected Datasets as Line chart
Triggering Event:	User clicks on the Line chart option while viewing a Dataset
Brief Description:	The user selects the view data on the Dashboard. The system displays five view dataset options: crime prior to one year data, fire station data, life safety evaluations data, police station data and public health service data. The user selects any one of the options from the five options. System displays the selected page to the user in the Dashboard. User now clicks on the Line Chart option from the view dataset page. System now displays a Line Chart basing on the selection corresponding dataset. For line Chart class, Chart.js is used to create canvas and plot the line charts for the respective datasets.
Actors:	User (Primary)
Related Use Cases:	Export Datasets, Filter Dataset
Stakeholders:	*User*: wants to plot a graph as Line Chart for the selected Dataset
Preconditions:	1. User should be logged on to the Dashboard 2. User should have selected the specific dataset which user wants to plot as a graph.

Post conditions:	1. Crime prior to one year data must be plotted as Line Chart if corresponding selection is made. 2. Fire station data must be plotted as Line Chart corresponding selection is made. 3. Life safety evaluations data must be plotted as Line Chart if corresponding selection is made. 4. Police station data must be plotted as Line Chart if corresponding selection is made. 5. Public health service data must be plotted as Line Chart if corresponding selection is made.

Flow of Events:	**User (actor)**	**System**
1. User Logs on to the dashboard 2. User selects a dataset 3. User selects Line Chart on Crime prior to one year option 4. User selects Line Chart on Fire station data 5. User selects Line Chart on Life safety evaluations data 6. User selects Line Chart on Police station data 6. User selects Line Chart on Health data		1.1 Displays Dashboard Homepage 3.1 Plots Crime prior to one year details on the page as Line Chart 4.1 Plots Fire station details on the page as Line Chart 5.1 Plots Life Safety Evaluations details on the page as Line Chart 6.1 Plots Police station details on the page as Line Chart 7.1 Plots Health details on the page as Line Chart

3. Use Case 3

   Plot Bar Chart

Use Case Name:	Plot Dataset as Bar chart
Scenario:	Dashboard must plot the Selected Datasets as Bar chart
Triggering Event:	User clicks on the Bar chart option while viewing a Dataset
Brief Description:	The user selects the view data on the Dashboard. The system displays five view dataset options: crime prior to one year data, fire station data, life safety evaluations data,

		police station data and public health service data. The user selects any one of the options from the five options. System displays the selected page to the user in the Dashboard. User now clicks on the Bar Chart option from the view dataset page. System now displays a Bar Chart basing on the selection corresponding dataset. For Bar Chart class, Chart.js is used to create canvas and plot the Bar charts for the respective datasets.
Actors:		User (Primary)
Related Use Cases:		Export Datasets, Filter Dataset
Stakeholders:		*User*: wants to plot a graph as Bar Chart for the selected Dataset
Preconditions:		1. User should be logged on to the Dashboard 2. User should have selected the specific dataset which user wants to plot as a graph.
Post conditions:		1. Crime prior to one year data must be plotted as Bar Chart if corresponding selection is made. 2. Fire station data must be plotted as Bar Chart corresponding selection is made. 3. Life safety evaluations data must be plotted as Bar Chart if corresponding selection is made. 4. Police station data must be plotted as Bar Chart if corresponding selection is made. 5. Public health service data must be plotted as Bar Chart if corresponding selection is made.
Flow of Events:	**User (actor)**	**System**
1. User Logs on to the dashboard 2. User selects a dataset 3. User selects Bar Chart on Crime prior to one year option 4. User selects Bar Chart on Fire station data 5. User selects Bar Chart on Life safety evaluations data 6. User selects Bar Chart on Police station data 6. User selects Bar Chart on Health data		1.1 Displays Dashboard Homepage 3.1 Plots Crime prior to one year details on the page as Bar Chart 4.1 Plots Fire station details on the page as Bar Chart 5.1 Plots Life Safety Evaluations details on the page as Bar Chart 6.1 Plots Police station details on the page as Bar Chart

	7.1 Plots Health details on the page as Bar Chart

4. Use Case 4

Plot Pie Chart

Use Case Name:	Plot Dataset as Pie chart
Scenario:	Dashboard must plot the Selected Datasets as Pie chart
Triggering Event:	User clicks on the Pie chart option while viewing a Dataset
Brief Description:	The user selects the view data on the Dashboard. The system displays five view dataset options: crime prior to one year data, fire station data, life safety evaluations data, police station data and public health service data. The user selects any one of the options from the five options. System displays the selected page to the user in the Dashboard. User now clicks on the Pie chart option from the view dataset page. System now displays a Pie chart basing on the selection corresponding dataset. For Pie Chart class, Chart.js is used to create canvas and plot the Pie charts for the respective datasets.
Actors:	User (Primary)
Related Use Cases:	Export Datasets, Filter Dataset
Stakeholders:	*User*: wants to plot a graph as Pie chart for the selected Dataset
Preconditions:	1. User should be logged on to the Dashboard 2. User should have selected the specific dataset which user wants to plot as a graph.
Post conditions:	

	1. Crime prior to one year data must be plotted as Pie chart if corresponding selection is made. 2. Fire station data must be plotted as Pie chart corresponding selection is made. 3. Life safety evaluations data must be plotted as Pie chart if corresponding selection is made. 4. Police station data must be plotted as Pie chart if corresponding selection is made. 5. Public health service data must be plotted as Pie chart if corresponding selection is made.

Flow of Events:	**User (actor)**	**System**
1. User Logs on to the dashboard 2. User selects a dataset 3. User selects Pie chart on Crime prior to one year option 4. User selects Pie chart on Fire station data 5. User selects Pie chart on Life safety evaluations data 6. User selects Pie chart on Police station data 6. User selects Pie chart on Health data		1.1 Displays Dashboard Homepage 3.1 Plots Crime prior to one year details on the page as Pie chart 4.1 Plots Fire station details on the page as Pie chart 5.1 Plots Life Safety Evaluations details on the page as Pie chart 6.1 Plots Police station details on the page as Pie chart 7.1 Plots Health details on the page as Pie chart

5. Use Case 5

Plot Polar Area Chart

Use Case Name:	Plot Dataset as Polar Area chart
Scenario:	Dashboard must plot the Selected Datasets as Polar chart
Triggering Event:	User clicks on the Polar chart option while viewing a Dataset
Brief Description:	The user selects the view data on the Dashboard. The system displays five view dataset options: crime data, fire station data, life safety evaluations data, police station data and public health service data. The user selects

		any one of the options from the five options. System displays the selected page to the user in the Dashboard. User now clicks on the Polar chart option from the view dataset page. System now displays a Pivot chart basing on the selection corresponding dataset. For Polar Area Chart class, Chart.js is used to create canvas and plot the Polar Area charts for the respective datasets.
Actors:		User (Primary)
Related Use Cases:		Export Datasets, Filter Dataset
Stakeholders:		*User*: wants to plot a graph as Polar chart for the selected Dataset
Preconditions:		1. User should be logged on to the Dashboard 2. User should have selected the specific dataset which user wants to plot as a graph.
Post conditions:		1. Crime data must be plotted as Polar chart if corresponding selection is made. 2. Fire station data must be plotted as Polar chart corresponding selection is made. 3. Life safety evaluations data must be plotted as Polar chart if corresponding selection is made. 4. Police station data must be plotted as Polar chart if corresponding selection is made. 5. Public health service data must be plotted as Polar chart if corresponding selection is made.
Flow of Events:	**User (actor)**	**System**
1. User Logs on to the dashboard 2. User selects a dataset 3. User selects Pivot chart on Crime prior to one year option 4. User selects Pivot chart on Fire station data 5. User selects Pivot chart on Life safety evaluations data 6. User selects Pivot chart on Police station data 6. User selects Pivot chart on Health data		1.1 Displays Dashboard Homepage 3.1 Plots Crime data details on the page as Polar chart 4.1 Plots Fire station details on the page as Polar chart 5.1 Plots Life Safety Evaluations details on the page as Polar chart 6.1 Plots Police station details on the page as Polar chart

	7.1 Plots Health details on the page as Polar chart

6. Use Case 6

Plot Doughnut Chart

Use Case Name:	Plot Dataset as Doughnut chart
Scenario:	Dashboard must plot the Selected Datasets as Doughnut chart
Triggering Event:	User clicks on the Doughnut chart option while viewing a Dataset
Brief Description:	The user selects the view data on the Dashboard. The system displays five view dataset options: crime data, fire station data, life safety evaluations data, police station data and public health service data. The user selects any one of the options from the five options. System displays the selected page to the user in the Dashboard. User now clicks on the Doughnut chart option from the view dataset page. System now displays a Doughnut chart basing on the selection corresponding dataset. For Doughnut Chart class, Chart.js is used to create canvas and plot the Doughnut charts for the respective datasets.
Actors:	User (Primary)
Related Use Cases:	Export Datasets, Filter Dataset
Stakeholders:	*User*: wants to plot a graph as Doughnut chart for the selected Dataset
Preconditions:	1. User should be logged on to the Dashboard 2. User should have selected the specific dataset which user wants to plot as a graph.
Post conditions:	

	1. Crime data must be plotted as Doughnut chart if corresponding selection is made. 2. Fire station data must be plotted as Doughnut chart corresponding selection is made. 3. Life safety evaluations data must be plotted as Doughnut chart if corresponding selection is made. 4. Police station data must be plotted as Doughnut chart if corresponding selection is made. 5. Public health service data must be plotted as Doughnut chart if corresponding selection is made.

Flow of Events:	**User (actor)**	**System**
1. User Logs on to the dashboard 2. User selects a dataset 3. User selects Stacked chart on Crime prior to one year option 4. User selects Stacked chart on Fire station data 5. User selects Stacked chart on Life safety evaluations data 6. User selects Stacked chart on Police station data 6. User selects Stacked chart on Health data		1.1 Displays Dashboard Homepage 3.1 Plots Crime data details on the page as Doughnut chart 4.1 Plots Fire station details on the page as Doughnut chart 5.1 Plots Life Safety Evaluations details on the page as Doughnut chart 6.1 Plots Police station details on the page as Doughnut chart 7.1 Plots Health details on the page as Doughnut chart

7. Use Case 7

Export Dataset

Use Case Name:	Export Data
Scenario:	Dashboard will allow user to export data
Triggering Event:	User clicks on export data button and datasets will be exported
Brief Description:	The system displays five dataset options: crime prior to one year data, fire station data, life safety evaluations data, police station data and public health service data. The user selects

		any one of the options from the five options. User clicks on export button and dataset is exported in CSV format .This use-case is divided into five sub use-cases based on the selection of the view datatype by the user. The five sub-cases are described below as crime prior to one year data, fire station data, life safety evaluations data, police station data and public health service data. The Export.js uses JSONExport.js and CSVExport.js for downloading the respective formats by the user.
Actors:		User (Primary)
Related Use Cases:		Export Datasets
Stakeholders:		*User*: wants to export selected Dataset
Preconditions:		1. User should be logged on to the Dashboard 2.. User should be able to see the specific dataset
Post conditions:		1. Crime prior to one year data must be exported if corresponding selection is made. 2. Fire station data must be exported if corresponding selection is made. 3. Life safety evaluations data must be exported if corresponding selection is made. 4. Police station data must be exported if corresponding selection is made. 5. Public health service data must be exported if corresponding selection is made.
Flow of Events:	**User (actor)**	**System**
1 User logs on to the dashboard 2. User chooses dataset 3. User clicks on export button 4. User selects the format 5. User log off		1.1 Displays option to select the dataset 2.1 System displays the selected dataset 3.1 System displays two options to export CSV/JSON 4.1 dataset is downloaded in selected format

8. Use Case 8

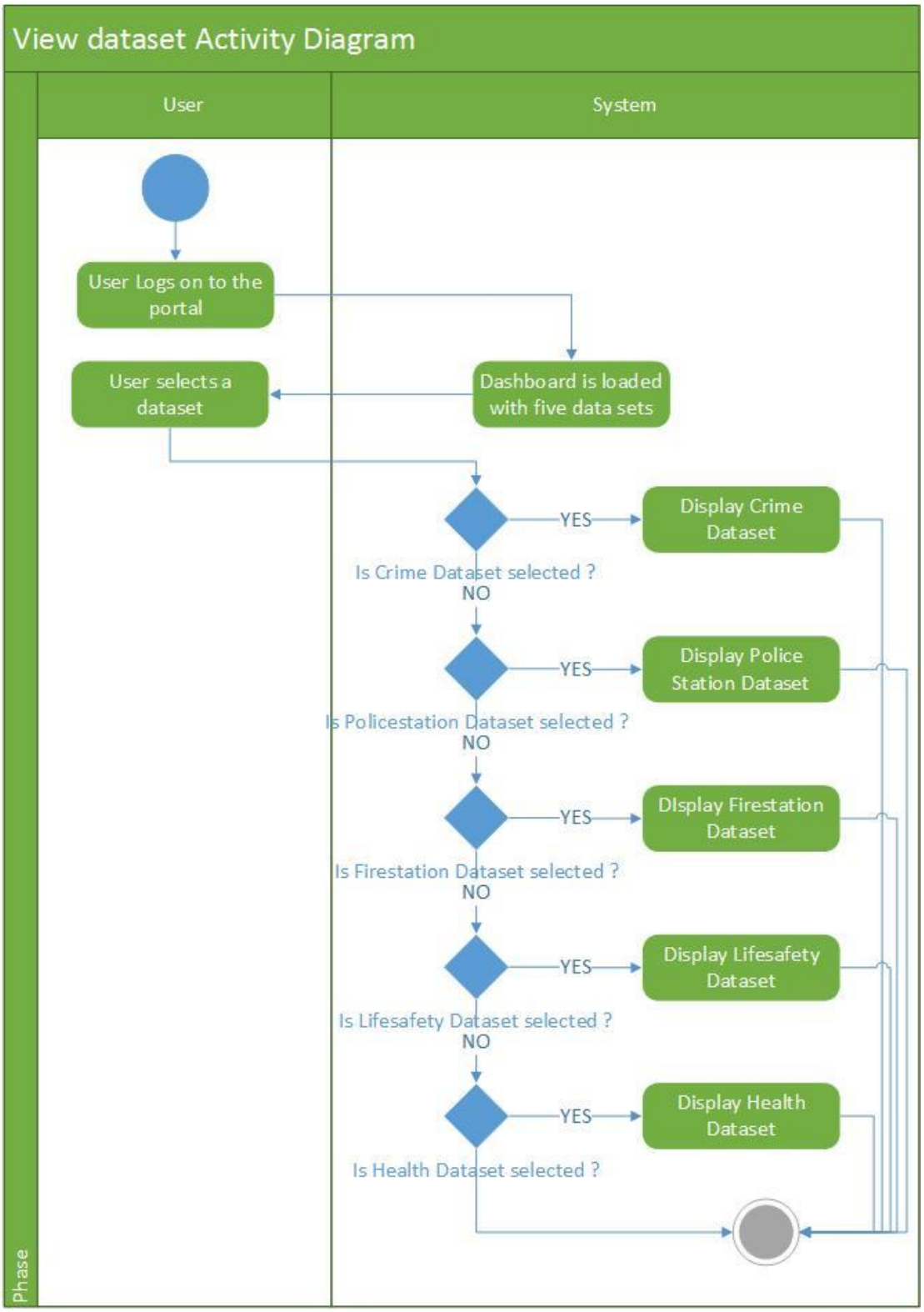
Filter Dataset

Use Case Name:	Filter Data
Scenario:	Dashboard will allow user to filter data
Triggering Event:	User clicks on filter data button and datasets will be filtered and displayed
Brief Description:	The system displays five dataset options: crime prior to one year data, fire station data, life safety evaluations data, police station data and public health service data. The user selects any one of the options from the five options. User clicks on filter button and dataset is filter. User can use filter by row or filter by condition. This use-case is divided into five sub use-cases based on the selection of the view datatype by the user. The five sub-cases are described below as crime prior to one year data, fire station data, life safety evaluations data, police station data and public health service data.
Actors:	User (Primary)
Related Use Cases:	Filter Datasets
Stakeholders:	*User*: wants to filter selected Dataset
Preconditions:	1. User should be logged on to the Dashboard 2. User should be able to see the specific dataset.
Post conditions:	1. Crime prior to one year data must be filtered if corresponding selection is made. 2. Fire station data must be filtered if corresponding selection is made. 3. Life safety evaluations data must be filtered if corresponding selection is made. 4. Police station data must be filtered if corresponding selection is made. 5. Public health service data must be filtered if corresponding selection is made.

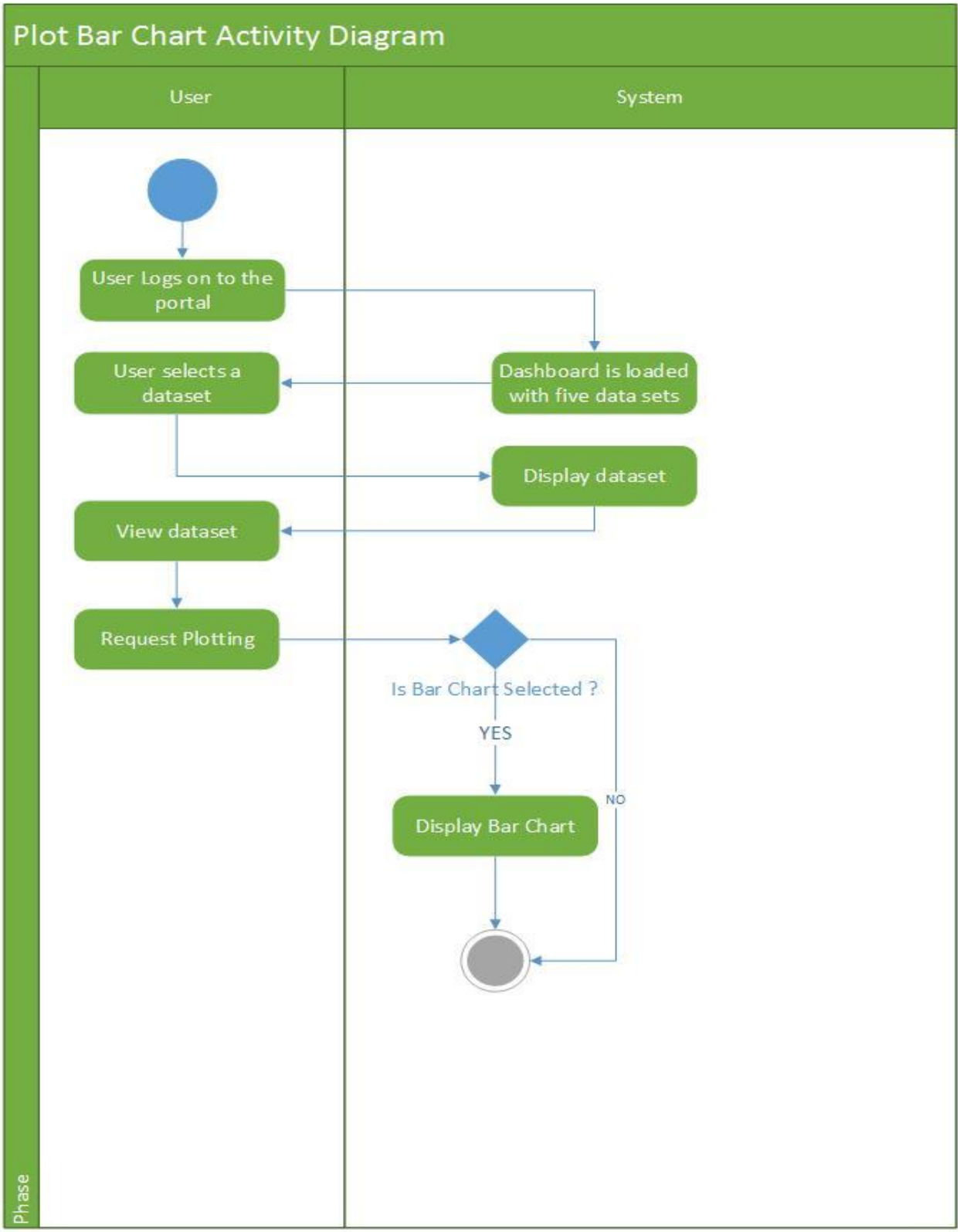
Flow of Events:	**User (actor)**	**System**
1 User logs on to the dashboard 2. User chooses dataset 3. User clicks on filter button 4. User selects filter by row or condition 5. User log off		1.1 Displays option to select the dataset 2.1 System displays the selected dataset 3.1 System displays two options to filter by row and condition 4.1 dataset is filtered and displayed

Chapter 7 Activity Diagrams

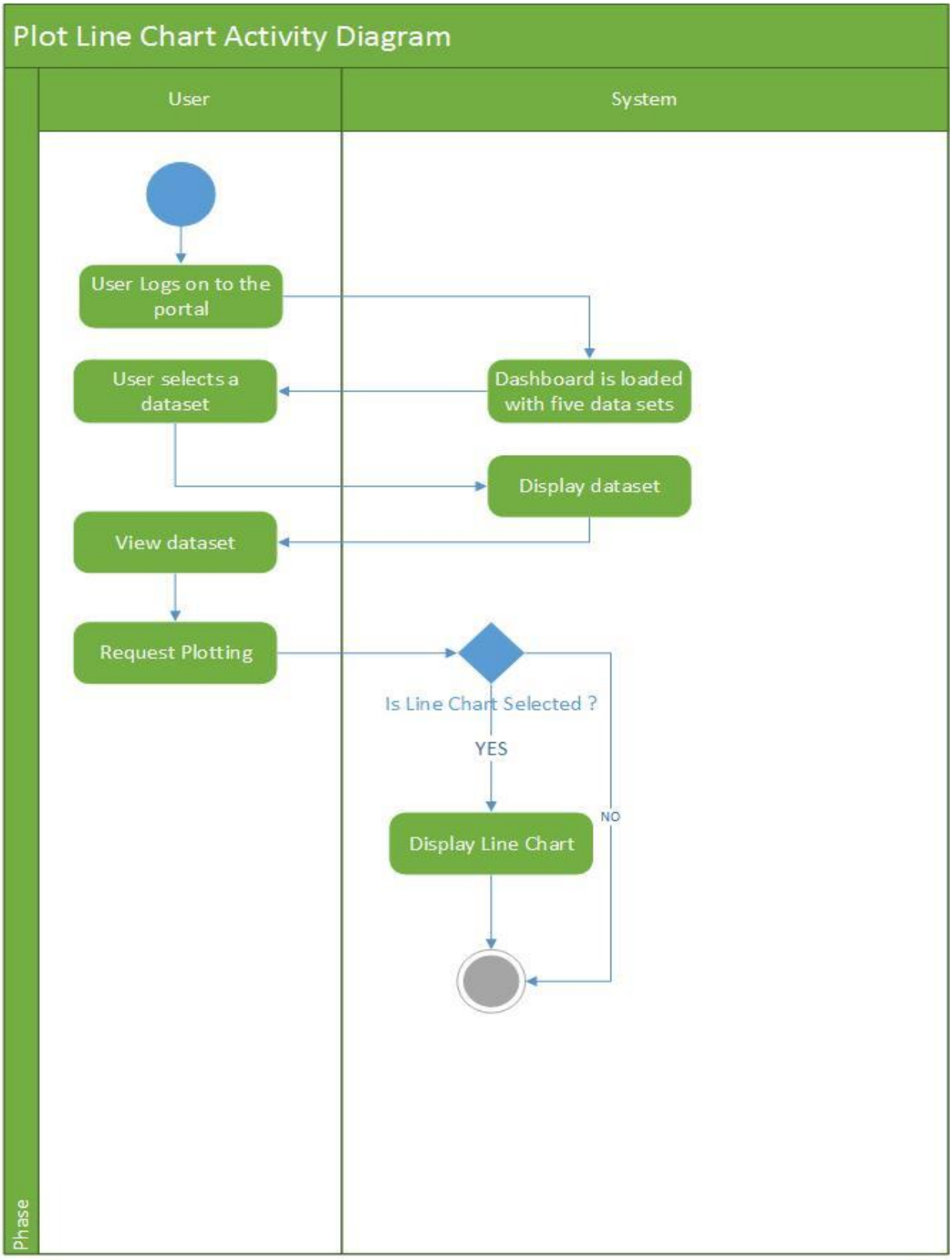
1. View Dataset



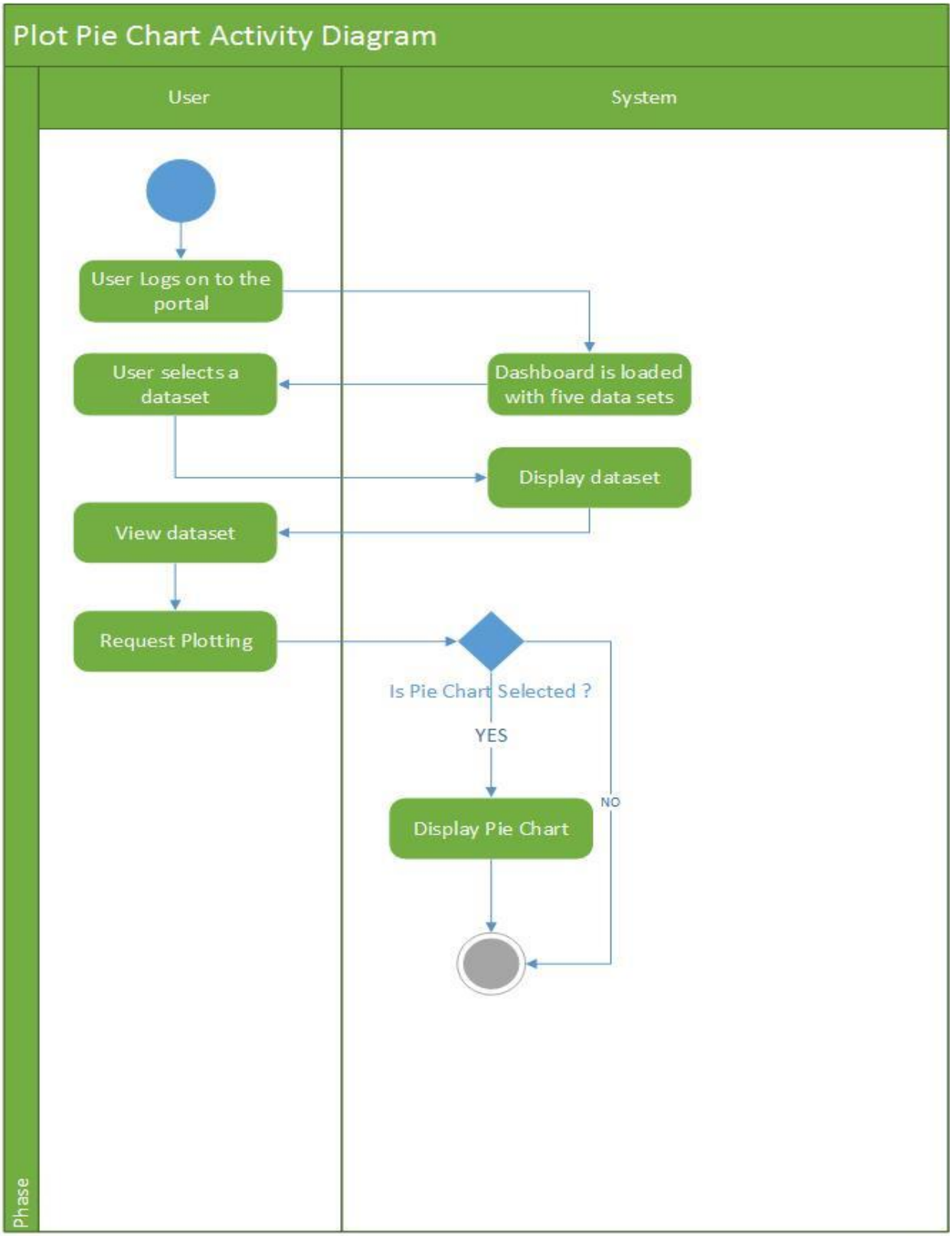
2. Plot Bar Chart



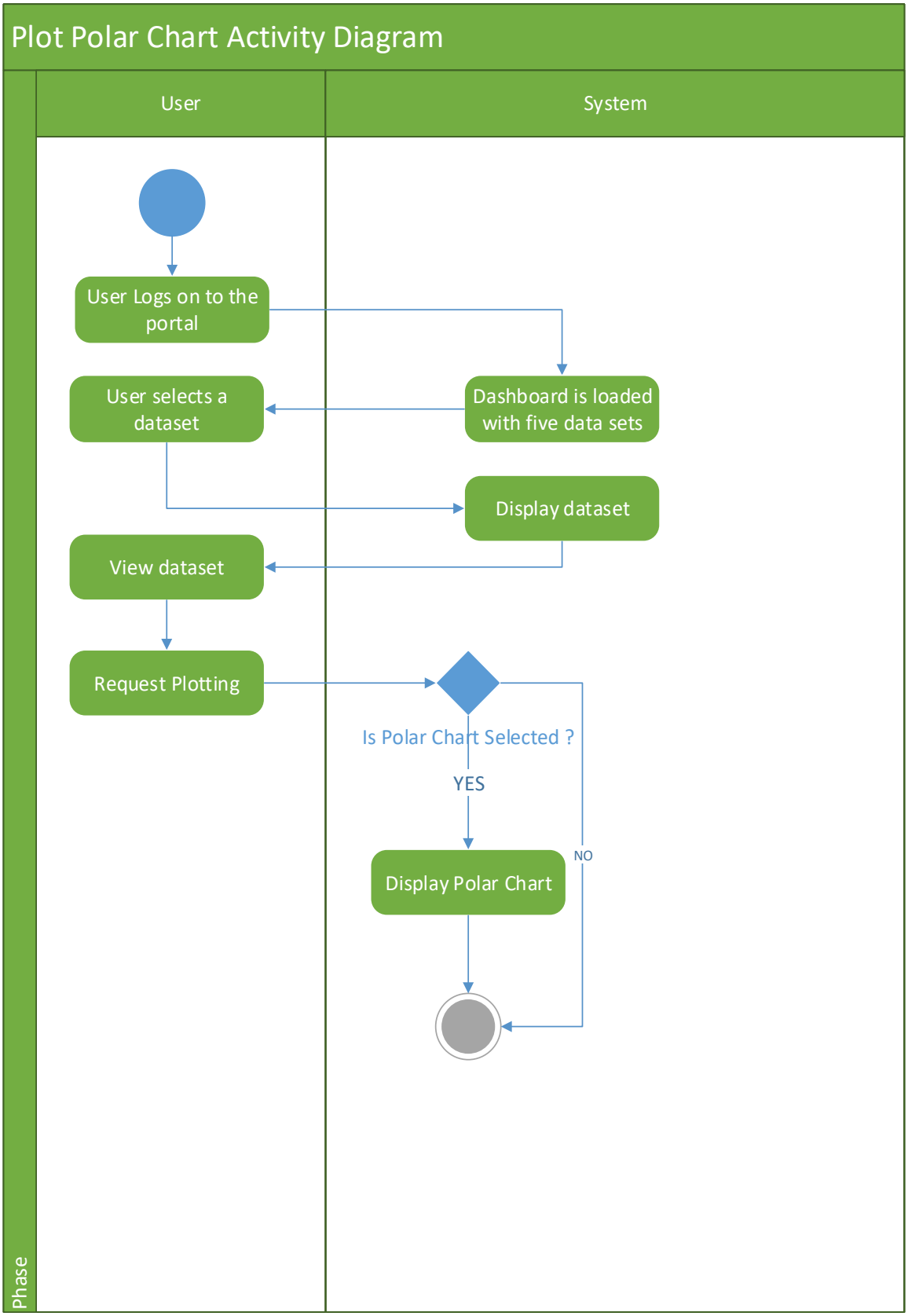
3. Plot Line Chart



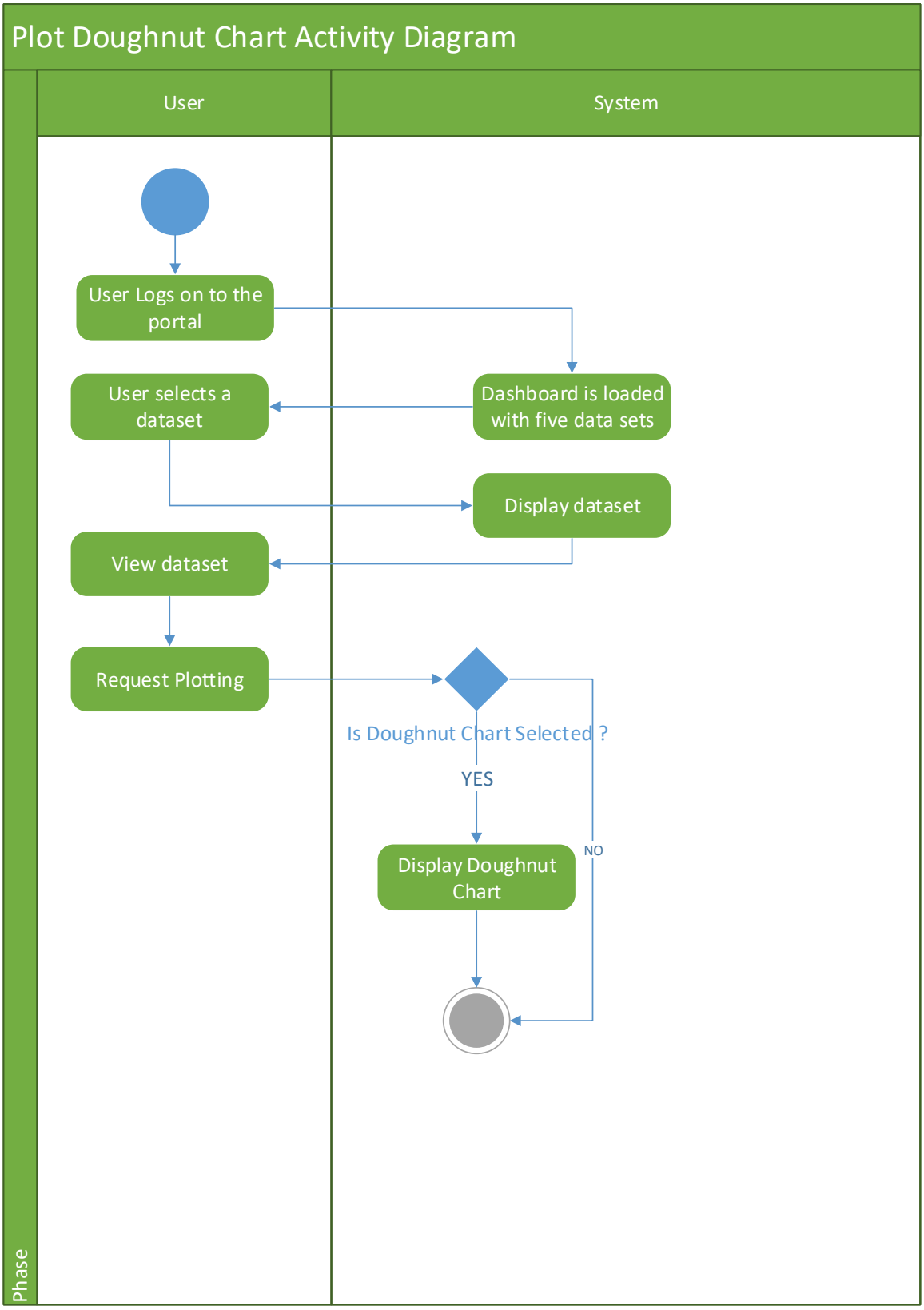
4. Plot Pie Chart



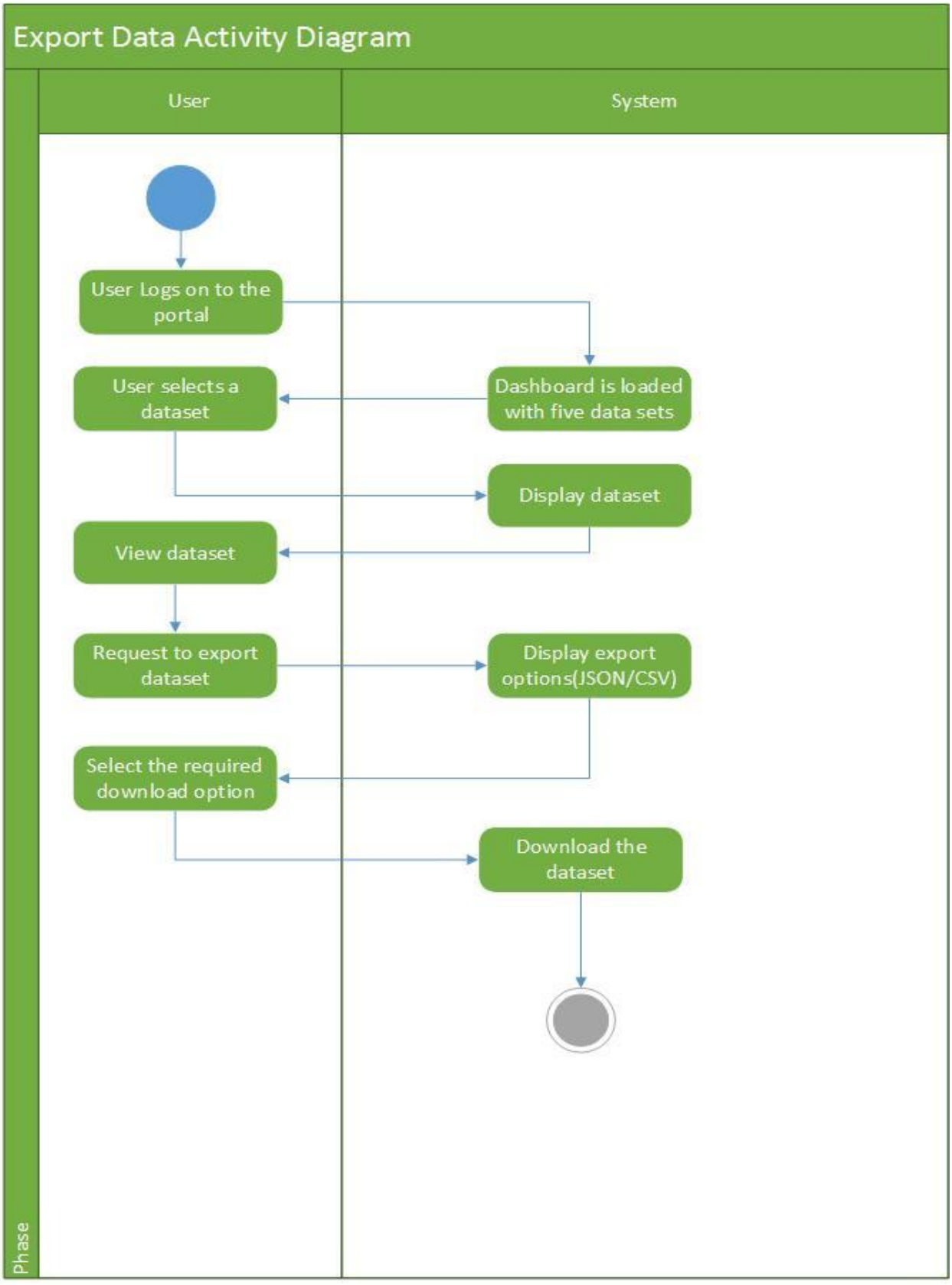
5. Plot Polar Area Chart



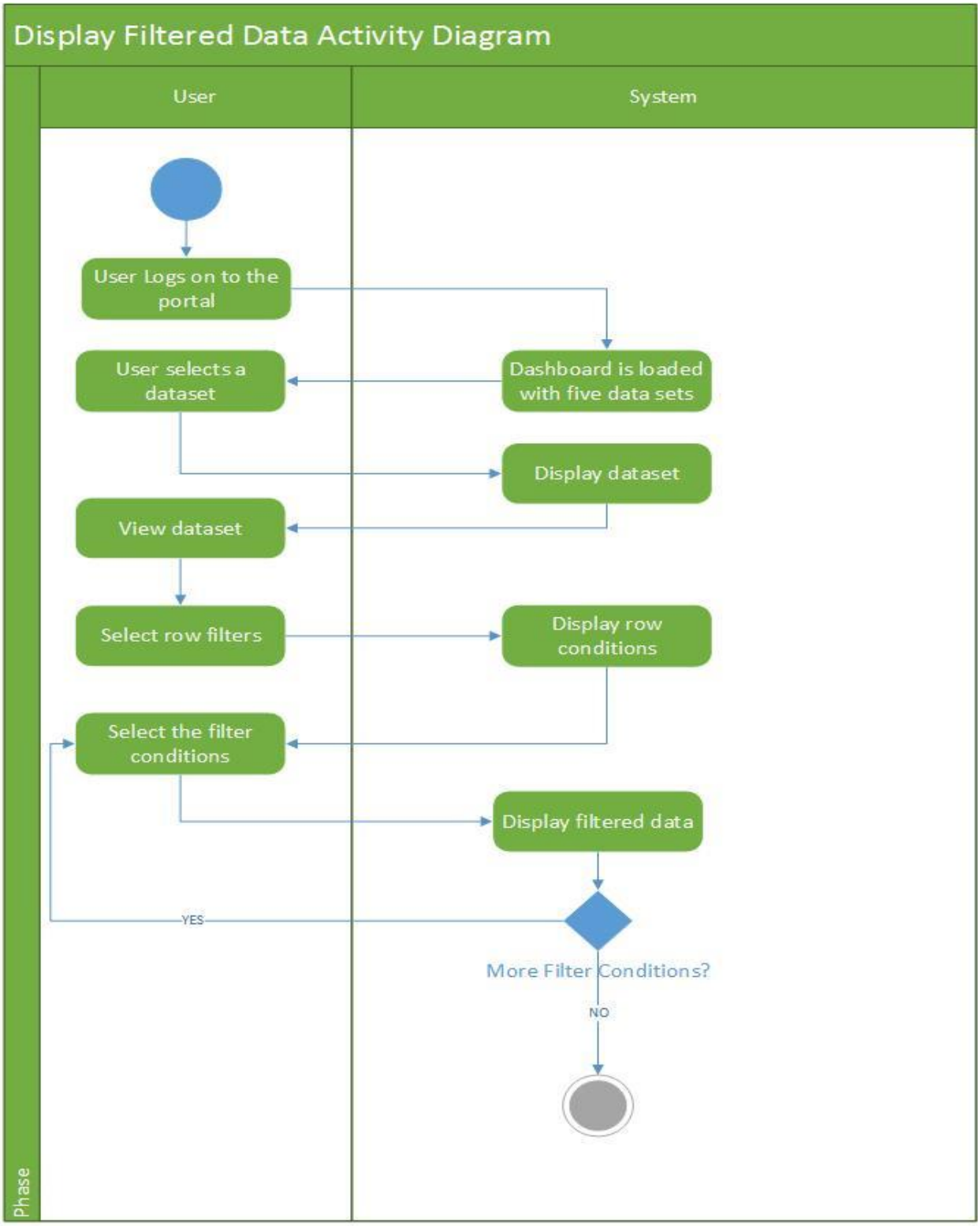
6. Plot Doughnut Chart



7. Export Dataset

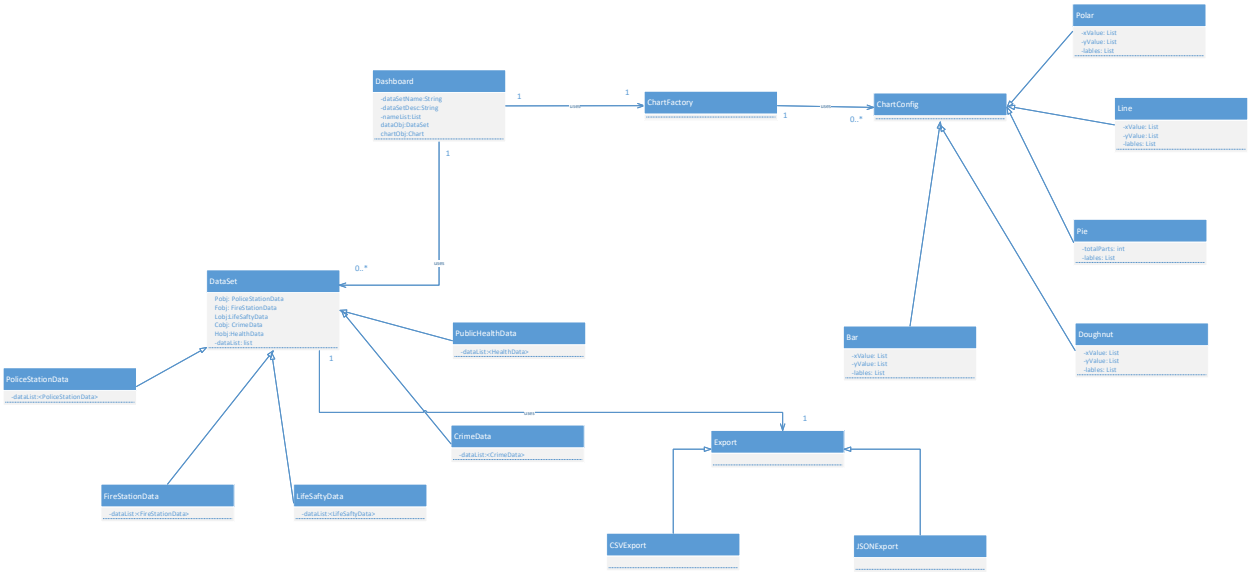


8. Filter Dataset



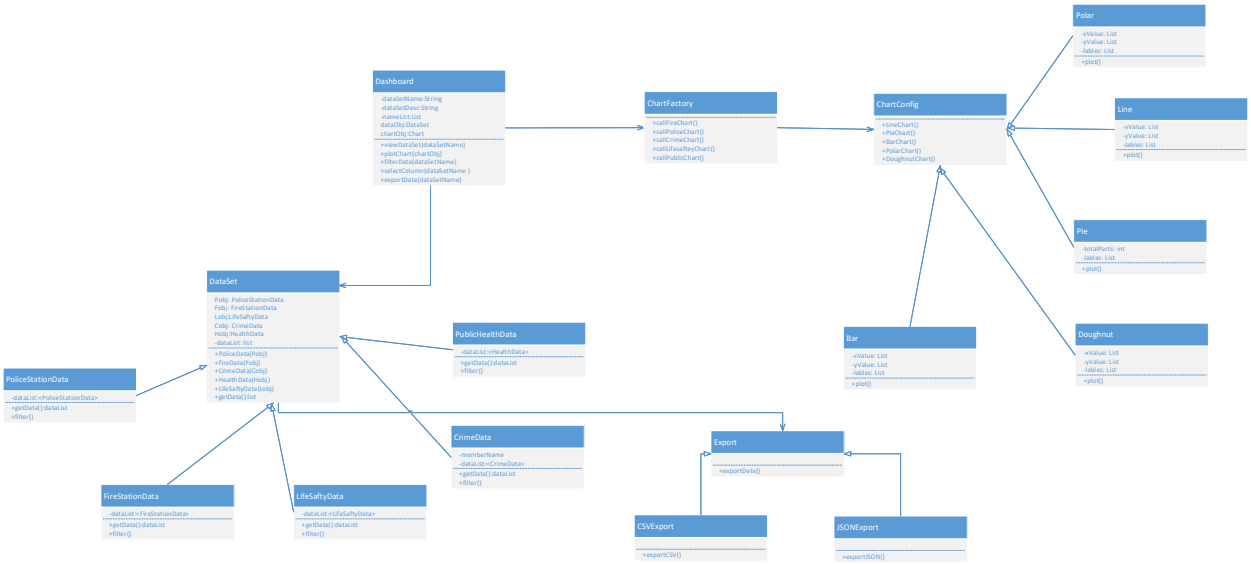
Chapter 8 Domain Model

Domain Model for Public Safety



Chapter 9 Design Model

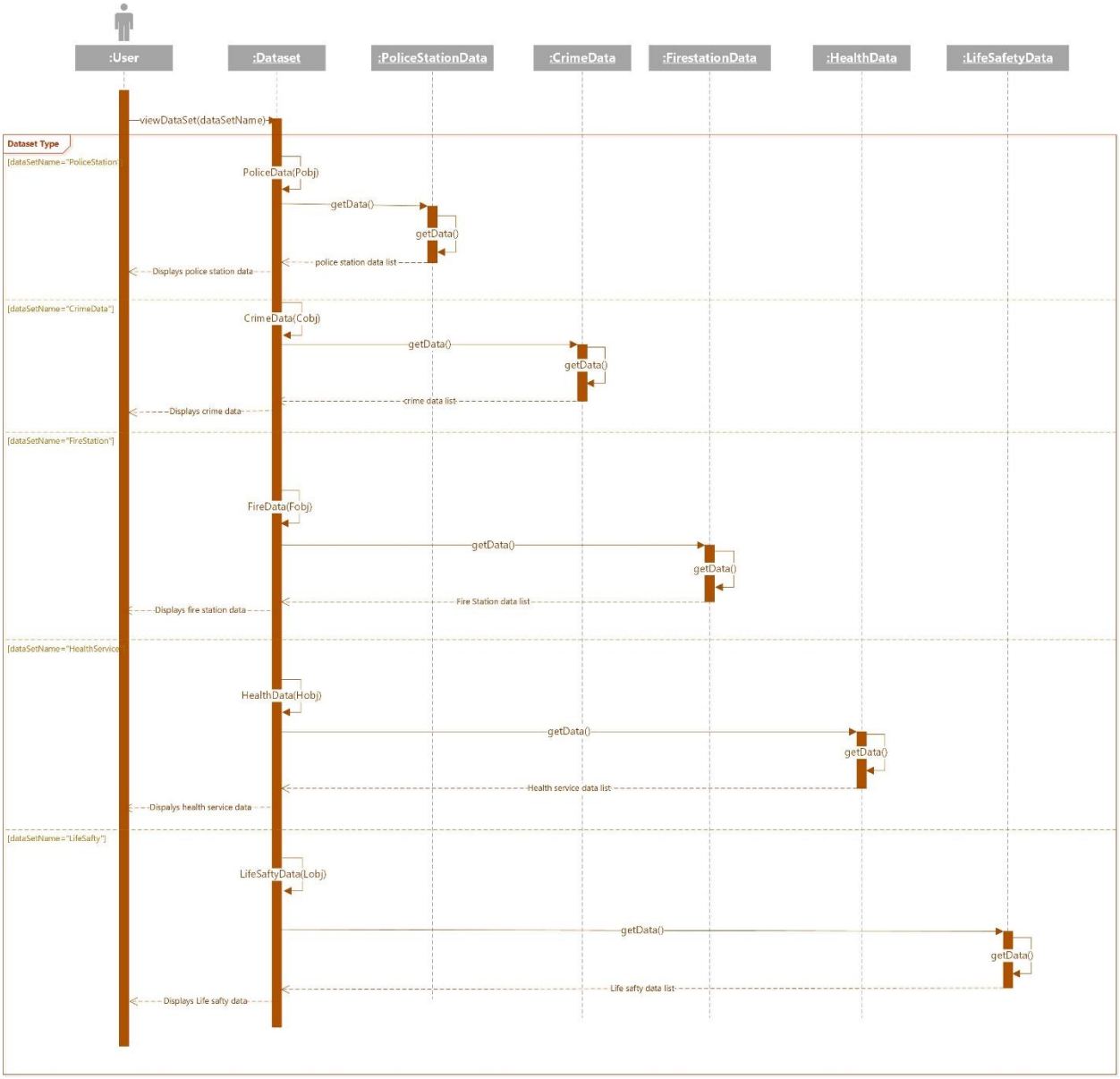
Design Model for Public Safety



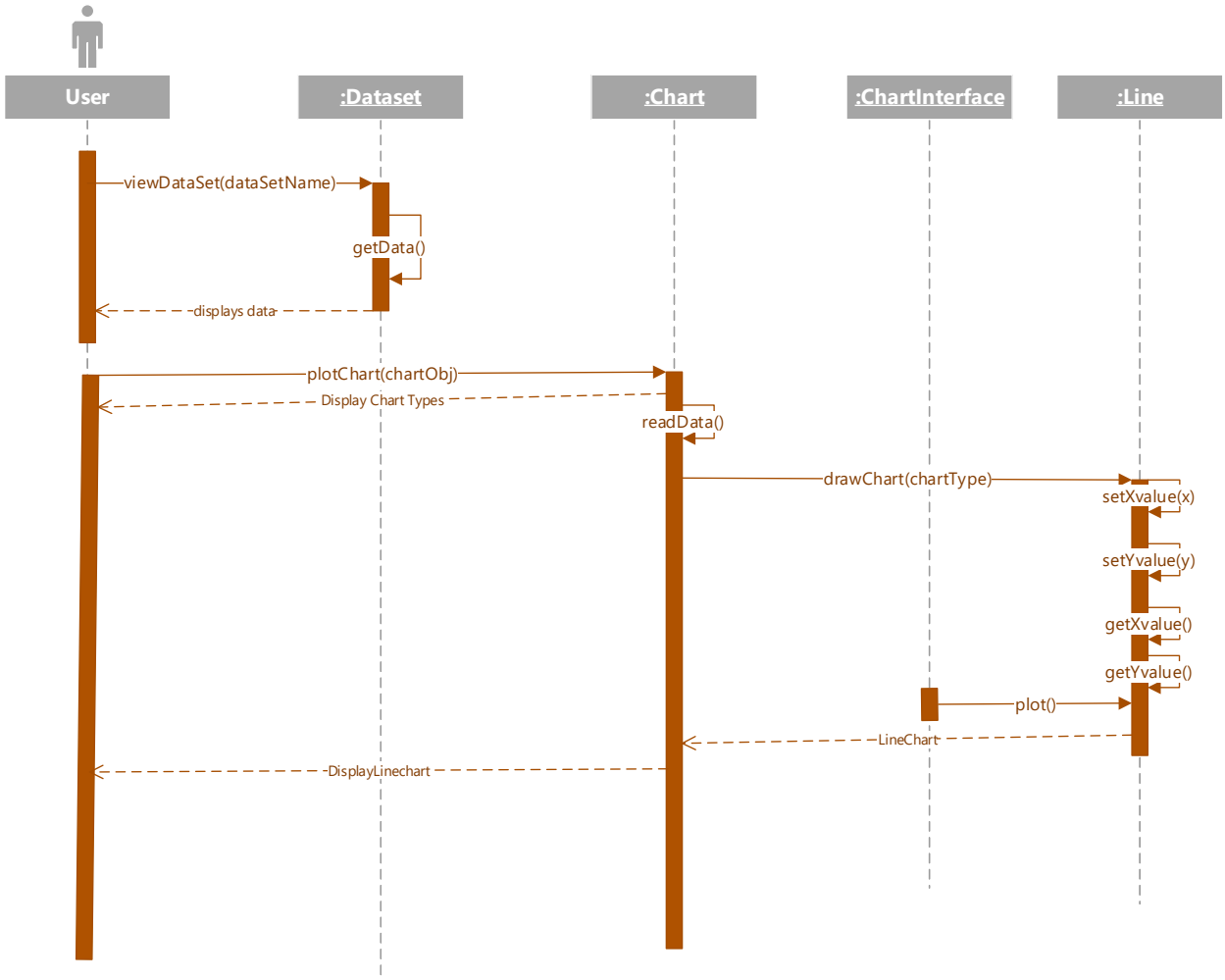
Chapter 10 Sequence Diagrams

Following are the Sequence Diagrams for the Dash Board Project

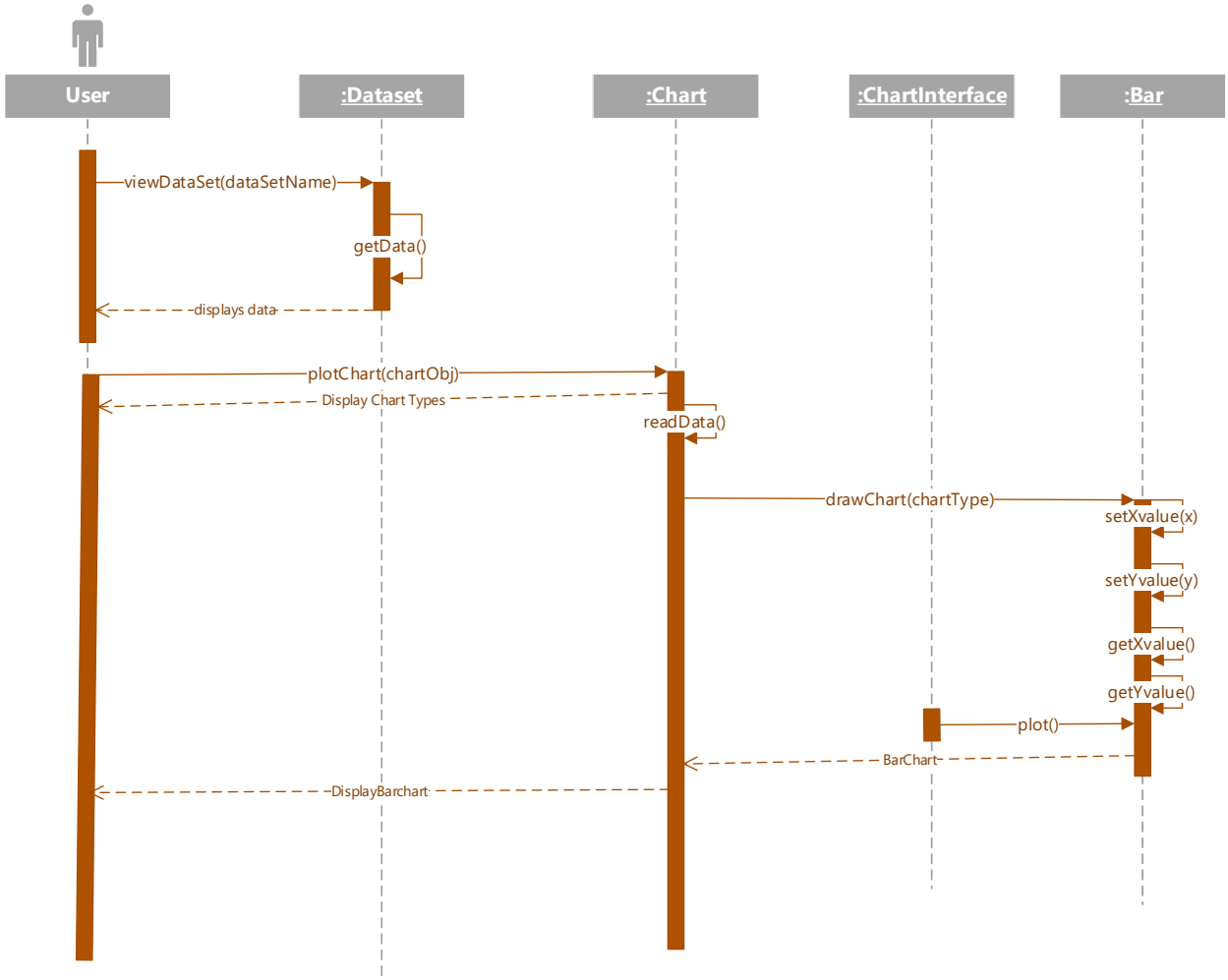
View Data set



Line Chart


User
:Dataset
:Chart
:ChartInterface
:Line
viewDataSet(dataSetName)
getData()
displays data
plotChart(chartObj)
Display Chart Types
readData()
drawChart(chartType)
setXvalue(x)
setYvalue(y)
getXvalue()
getYvalue()
plot()
LineChart
DisplayLinechart

Bar Chart


User
:Dataset
:Chart
:ChartInterface
:Bar
viewDataSet(dataSetName)
getData()
displays data
plotChart(chartObj)
Display Chart Types
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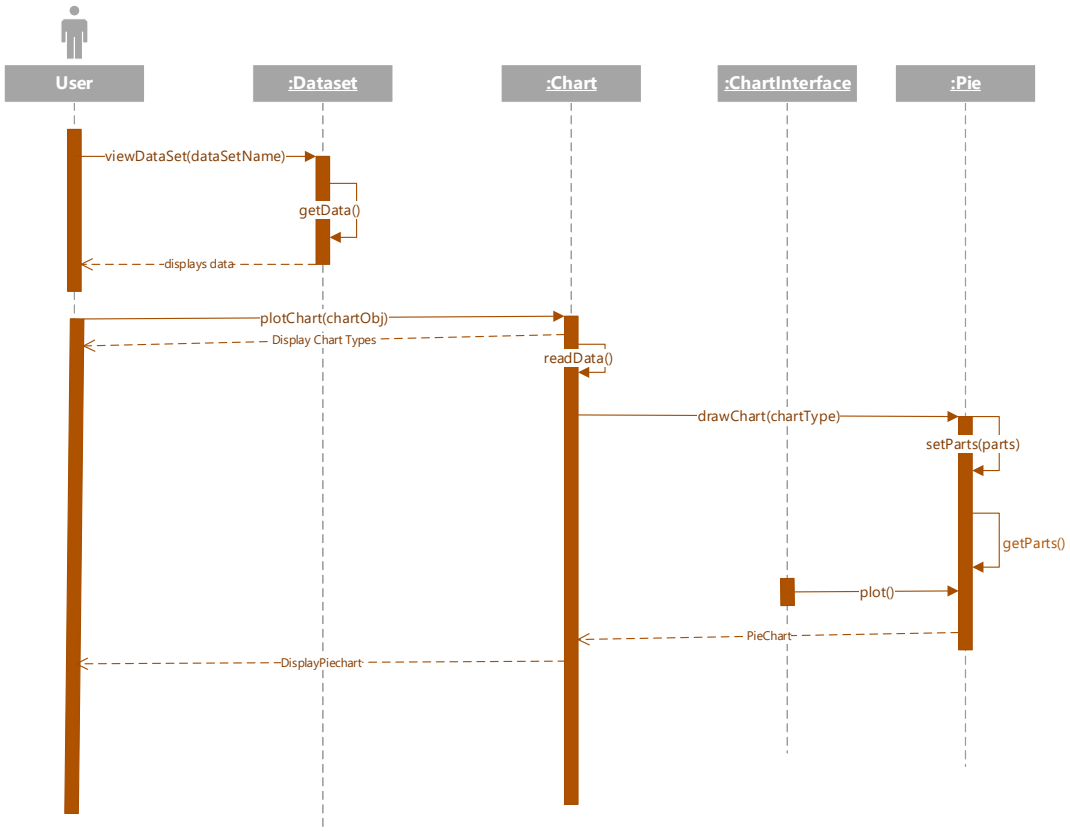
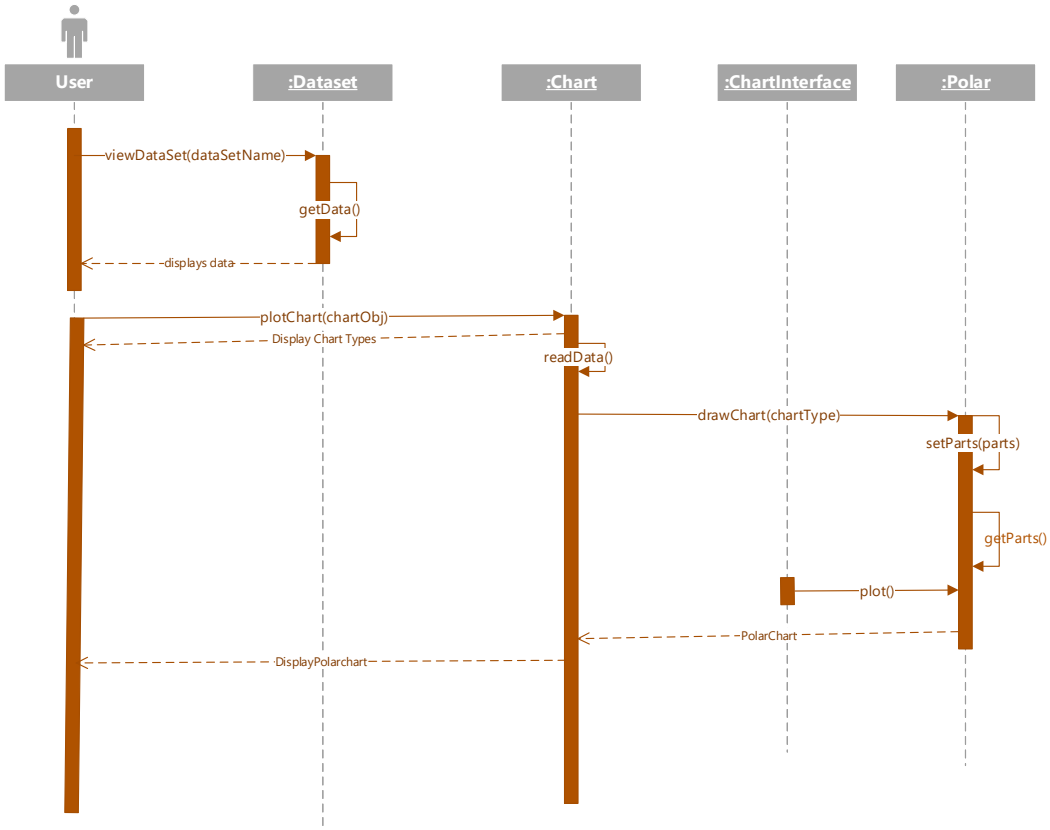
setXvalue(x)
setYvalue(y)
getXvalue()
getYvalue()
plot()
BarChart
DisplayBarchart

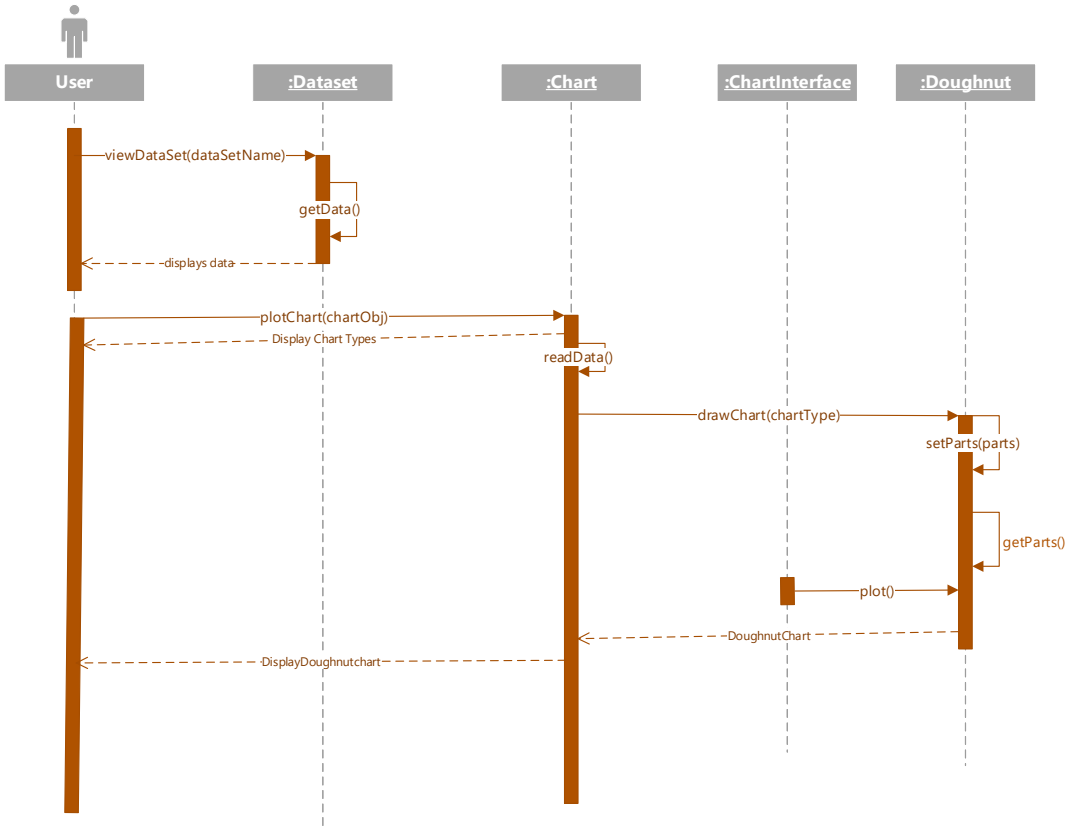
Pie Chart


User
:Dataset
:Chart
:ChartInterface
:Pie
viewDataSet(dataSetName)
getData()
displays data
plotChart(chartObj)
Display Chart Types
readData()
drawChart(chartType)
setParts(parts)
getParts()
plot()
PieChart
DisplayPiechart

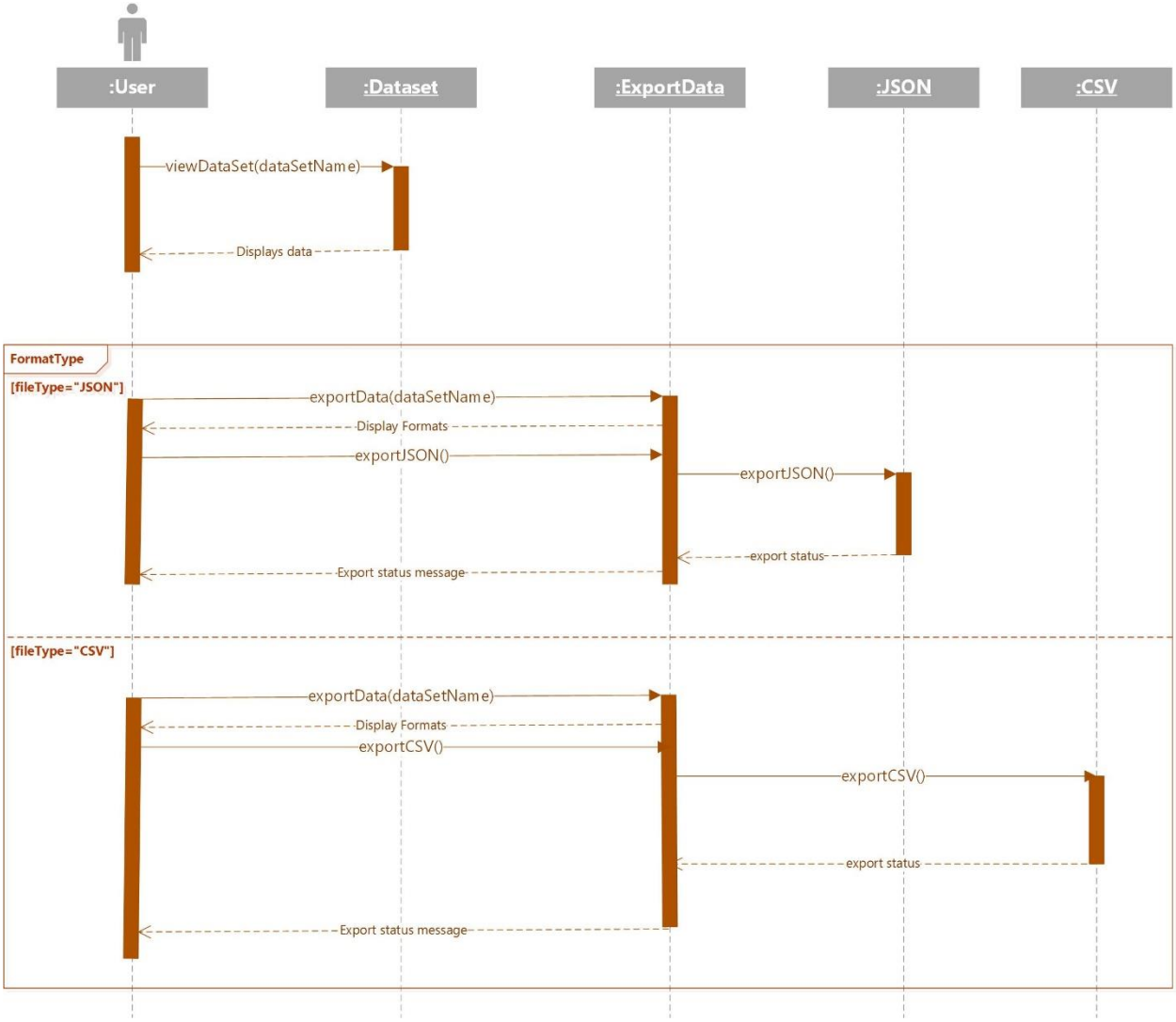
Polar Area Chart



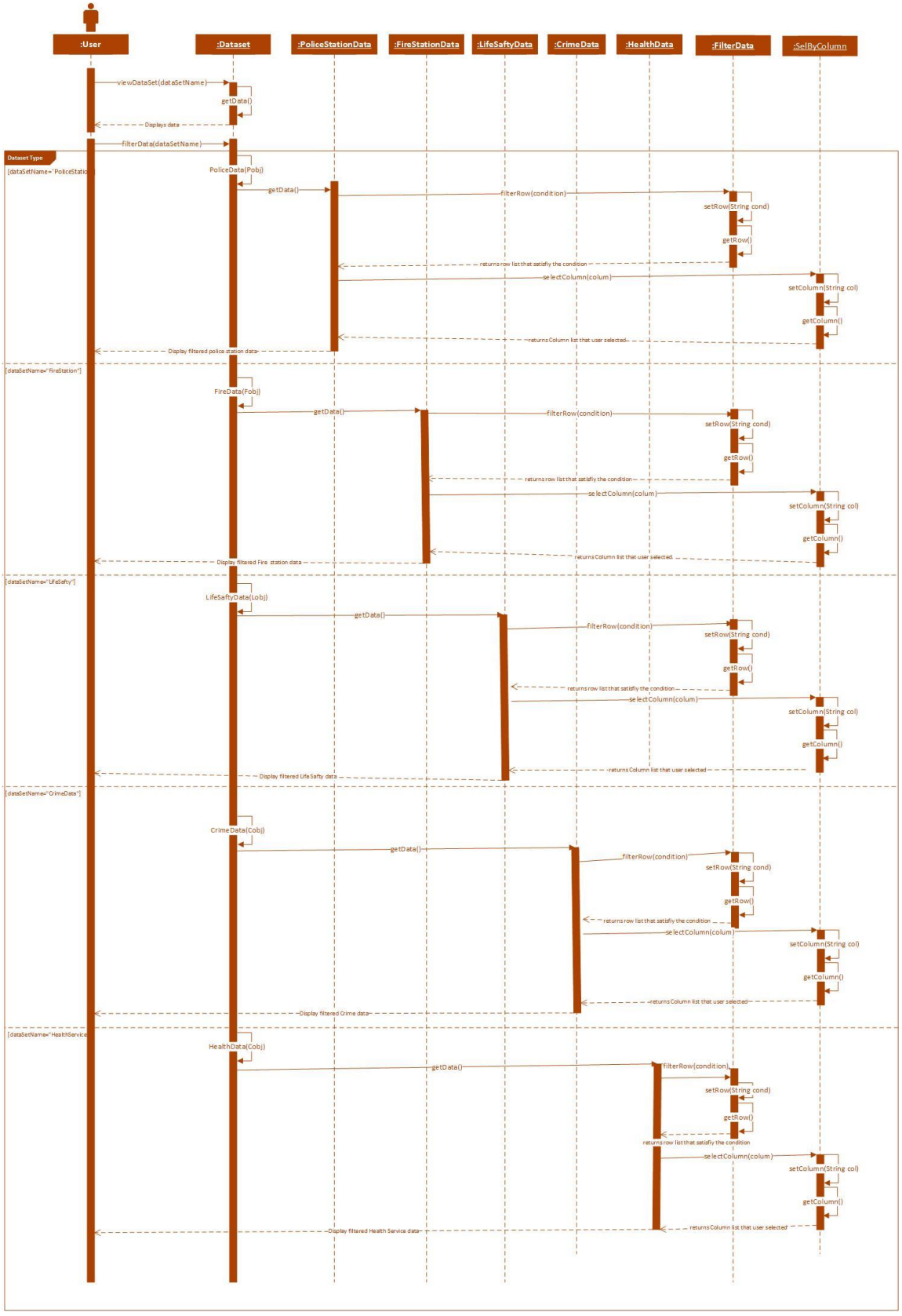
Doughnut Chart



Export Data Set



Filter Dataset



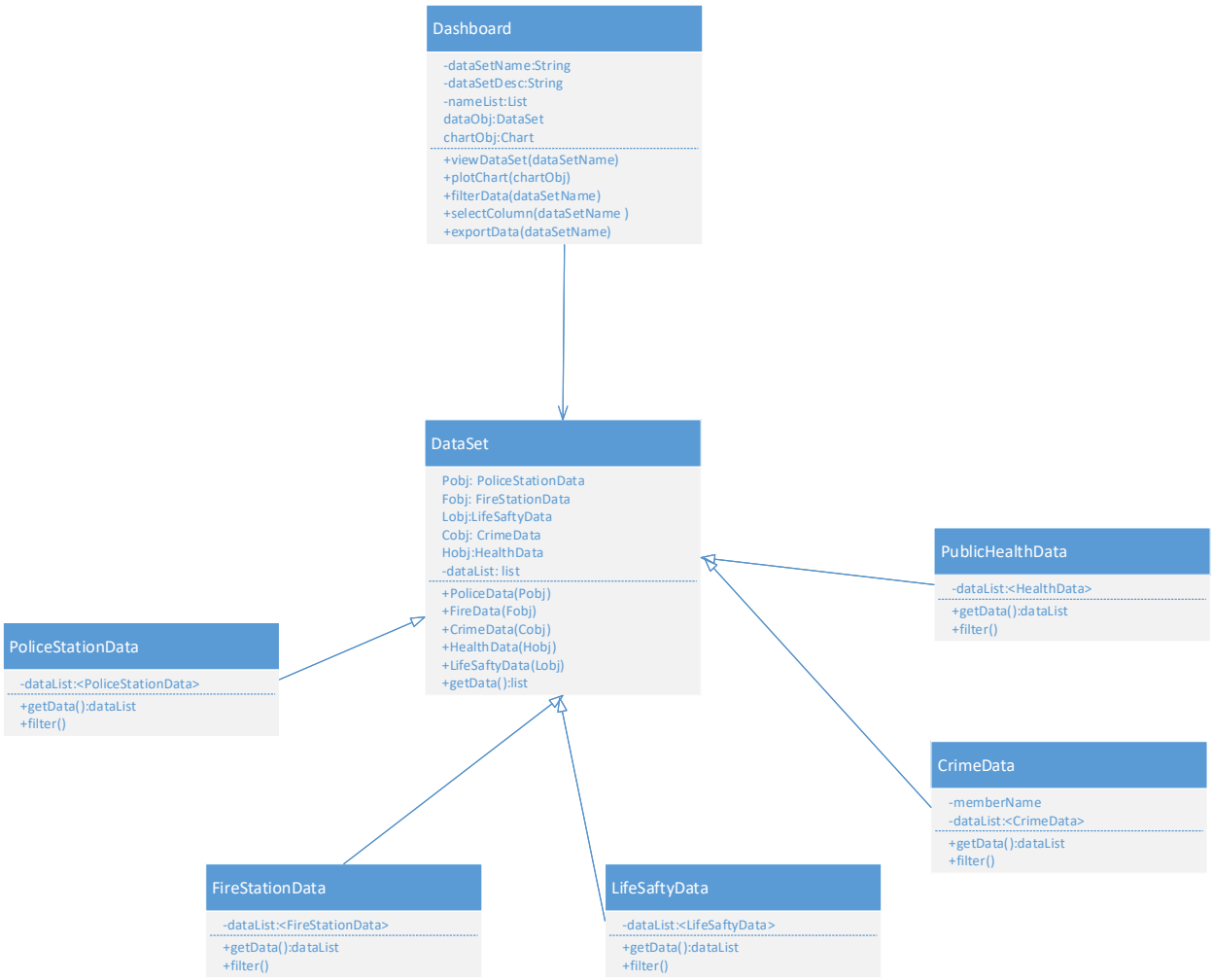
Chapter 11 Design Patterns Documentation

1. Observer Design Pattern

Object Oriented Goal: Favoring Composition over Inheritance, Programming to interface and not implementation, maintaining loosely coupled designs between the objects that interact.

Definition: The Observer Pattern defines a One-to-Many dependency between objects so that when one object changes state, its dependents are notified and updated automatically.

Usage in Project: In our project Dashboard class will act as subject which displays the data. When user clicks to view particular dataset data the dashboard will display it and when user filters the column the notification from respective dataset class will be sent to dashboard so that only selected columns will be displayed to user.



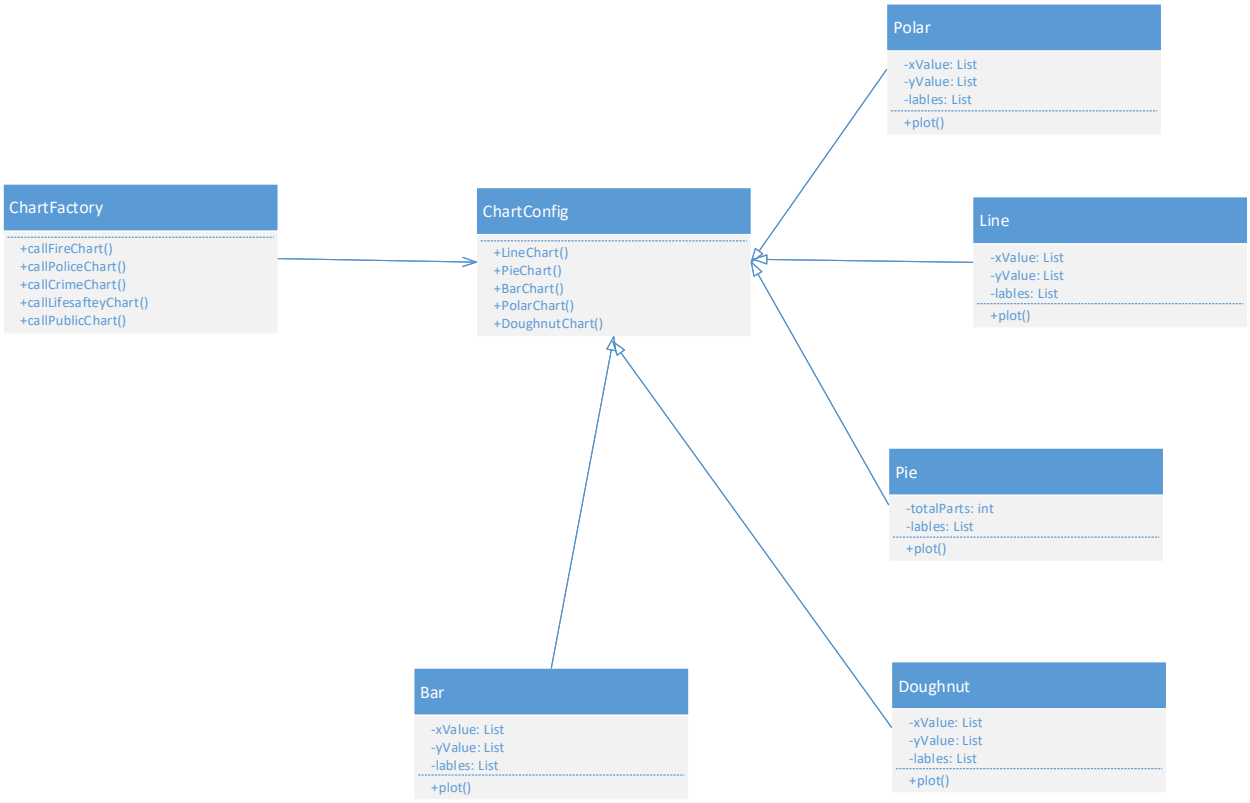
2. Factory Method Design Pattern

In class-based programming, the factory method pattern is a creational pattern that uses factory methods to deal with the problem of creating objects without having to specify the exact class of the object that will be created. This is done by creating objects by calling a factory method—either specified in an interface and implemented by child classes, or implemented in a base class and optionally overridden by derived classes—rather than by calling a constructor.

Definition: Creating an object often requires complex processes not appropriate to include within a composing object. The object's creation may lead to a significant duplication of code, may require information not accessible to the composing object, may not provide a sufficient level of abstraction, or may otherwise not be part of the composing object's concerns. The factory method design pattern handles these problems by defining a separate method for creating the objects, which subclasses can then override to specify the derived type of product that will be created.

The factory method pattern relies on inheritance, as object creation is delegated to subclasses that implement the factory method to create objects.

Usage in Project: The ChartFactory class will create a chart object depending on the user selected chart type and calls ChartConfig class. Later ChartConfig class will config the chart by loading the data from file and calls respective chart class to display chart.



3. Singleton Design Pattern

Singleton pattern restricts the instantiation of a class and ensures that only one instance of the class exists in the java virtual machine. The singleton class must provide a global access point to get the instance of the class. Singleton pattern is used for logging, drivers objects, caching and thread pool. Singleton should be considered only if all three of the following criteria are satisfied:

1) Ownership of the single instance cannot be reasonably assigned

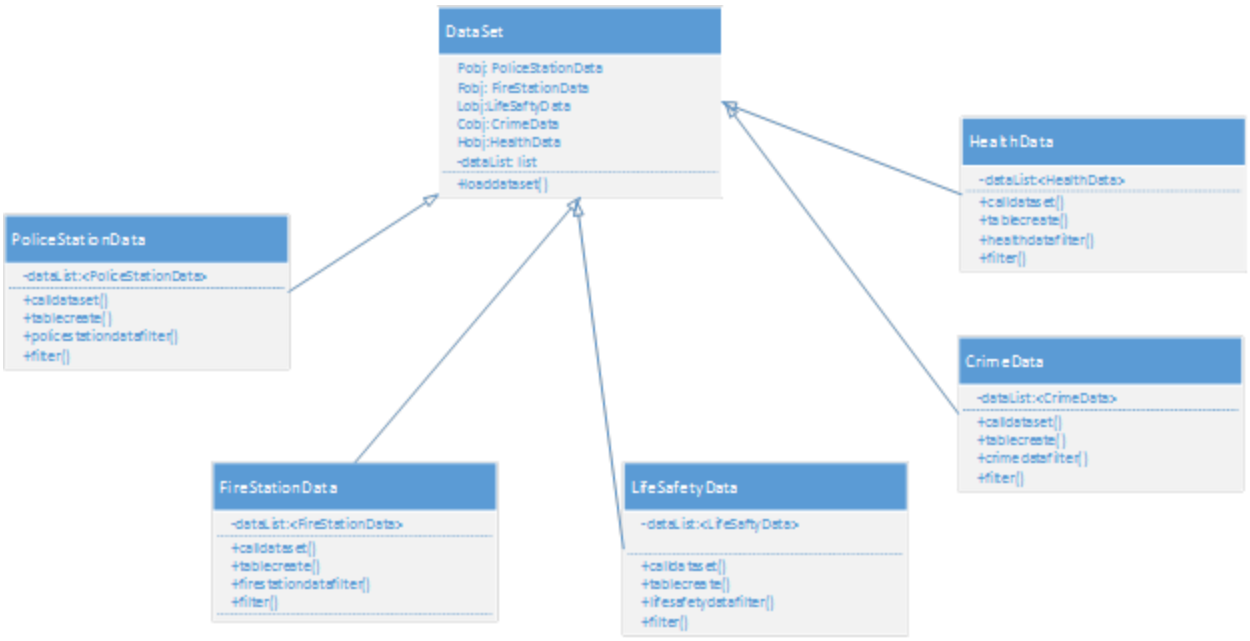
2)Lazy initialization is desirable

3)Global access is not otherwise provided for

If ownership of the single instance, when and how initialization occurs, and global access are not issues, Singleton is not sufficiently interesting.

The Singleton pattern can be extended to support access to an application-specific number of instances.

In our case all datasets in out case is extending main dataset class.



4. Template Design Pattern

In Template pattern, an abstract class exposes ways to execute its methods. Its subclasses can override the method implementation as per need and the requirement. This pattern comes under behavior pattern category.

Usage in the Project: Here in this class diagram Export is an abstract class and JSON and CSV are the concrete classes.