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*title: "Water Retaining Facilities Analysis"*

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*date: "2024-07-13"*

*output: html\_document*

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This section sets up the metadata for the R Markdown document. It specifies the title of the document, the authors (your name and the professor's name), the date, and the output format (HTML document).

```{r setup, include=FALSE}

*knitr::opts\_chunk$set(echo = TRUE)*

*library(rmarkdown)*

*setwd("D:/datascience/Spatial Data Science")*

*getwd()*

```

This code chunk is for setup purposes. It does the following:

* Sets global options for the R Markdown chunks using knitr::opts\_chunk$set(). Here, echo = TRUE means that the R code will be displayed in the final document.
* Loads the rmarkdown library.
* Sets the working directory to "D:/datascience/Spatial Data Science".
* Retrieves and prints the current working directory.

```{r}

*WaterRetaining = read.csv("WaterRetainingFacilities.csv", sep = ",", header = TRUE)*

*summary(WaterRetaining)*

```

This chunk reads the data from a CSV file named "WaterRetainingFacilities.csv" into a dataframe called WaterRetaining. It then displays summary statistics for each variable in the dataset using the summary() function.

```{r}

*# Histogram of ImpoundmentLevel*

*hist(WaterRetaining$ImpoundmentLevel,*

*main = "Histogram of ImpoundmentLevel",*

*xlab = "ImpoundmentLevel (mams)",*

*col = "blue")*

```

This chunk creates a histogram of the ImpoundmentLevel variable from the WaterRetaining dataset. It sets the main title of the histogram, the x-axis label, and the color of the bars to blue.

```{r}

*# Scatter plot of ImpoundmentLevel vs DamHeight*

*plot(WaterRetaining$DamHeight, WaterRetaining$ImpoundmentLevel,*

*main = "ImpoundmentLevel vs DamHeight",*

*xlab = "Dam Height (m)",*

*ylab = "Impoundment Level (mams)",*

*col = "red",*

*pch = 19)*

```

This chunk creates a scatter plot of ImpoundmentLevel against DamHeight. It sets the main title, x-axis label, y-axis label, point color (red), and point shape (pch = 19).

```{r}

*# Calculate mean and weighted mean centre for ImpoundmentLevel*

*mean\_impoundment = mean(WaterRetaining$ImpoundmentLevel, na.rm = TRUE)*

*weighted\_mean\_impoundment = sum(WaterRetaining$ImpoundmentLevel \* WaterRetaining$StorageLevel, na.rm = TRUE) / sum(WaterRetaining$StorageLevel, na.rm = TRUE)*

*mean\_impoundment*

*weighted\_mean\_impoundment*

```

This chunk calculates the mean and weighted mean of the ImpoundmentLevel variable:

* mean\_impoundment calculates the mean of ImpoundmentLevel, excluding any missing values (na.rm = TRUE).
* weighted\_mean\_impoundment calculates the weighted mean of ImpoundmentLevel using StorageLevel as weights.
* The calculated means are then displayed.