FACULTY OF ENGINEERING AND TECHNOLOGY

A REPORT ON IMPORTING DATA INTO MATLAB & STORING EACH MEMEBERS ATRIBUTES IN TO SINGLE VARIABLE

BY GROUP 19

COURSE UNIT: COMPUTOR PROGRAMING

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ACKNOWLEDGEMENT

First and foremost, we would like to thank the Almighty God for giving us the strength to carry on with our research in group 19. We would love to extend our gratitude to all the persons with whose help we managed to make it this far. The willingness of each one of us to invest time and provide constructive feedback has been immensely valuable in this assignment. We wish to extend our gratitude to our lecturer for his consistent guidance and valuable insights throughout this assignment. His teaching and encouragement made it possible for us to understand and practically apply concepts of data importing, organization, and storage in MATLAB.

We also thank our group members for their cooperation and contribution. Each member actively participated in research, coding, and report writing, which ensured the success of this work. Finally, we would like to express our gratitude to all the sources and references that have been cited in this report

ABSTRACT

We started our first meeting for research on 14th, September, 2025 in the university library out of which we were exposed to various concepts on how to import, extract and feeding in data in to MATLAB as per the assignment which consisted of retrieving excel data from Kaggle.com website ,copying variables of each year to tables, converting tables to structural arrays, outputting each variable in to a single work book and generating a MATLAB code that can store each members' affirmation attributes. We achieved this through division combined efforts, Different members were assigned different tasks in order to ease the work and to save time.

DEDICATION

We dedicate this report to all the individuals especially Group 19 members, who have been there with us in the process of formulating and compiling this report. To our lecturer Mr. Maseruka Benedicto whose guidance and expertise have been invaluable, your mentorship and insightful feedback have shaped our understanding.

DECLARATION

We hereby certify and confirm that the information in this report is out of our own efforts, research and it has never been submitted in any institution for any academic award.

STUDENT NAME	REG.NO	COURSE	SIGNATURE
NTALE JOASH KATEREGA	BU/UG/2024/2595	WAR	
WANYAMA JOSEPH EROGO	BU/UP/2024/1077	WAR	
KAKULU ALFRED	BU/UP/2024/0981	MEB	
OKORI DARIOUS	BU/UP/2024/1061	WAR	
ALITEMA VICTOR	BU/UP/2024/5098	WAR	
AMASO SUSAN	BU/UP/2025/5435	PTI	
SIKUKU BELIZER RUTH	BU/UP/2024/0846	AMI	
TWICHIRIZE FLORENCE	BU/UP/2022/	WAR	
OKWI NICHOLAS	BU/UP/2024/4457	WAR	

APPROVAL

We are presenting this report which has been written and produced under our efforts. We carried out research on converting tables into structural arrays, outputting variables into single workbooks and writing codes that can store affirmation attributes.

DATE OF SUBMISSION: …….

SIGNATURE: ……..

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List OF ACRONYMS/ABBREVIATIONS.

MATLAB –Matrix Laboratory.

GUI – Graphics user interface.

1 CHAPTER 1: INTRODUCTION

1.1 Background

Matrix Laboratory, or just MATLAB, is an interpreted, high-speed programming language and computational environment employed in technical and scientific contexts. It was first developed in the late 1970s by computer science professor, Cleve Moler, who desired to provide his students with access to sets of mathematical software without their having to learn to program in Fortran themselves.

1.2 Historical Development

Early Development: The initial release of MATLAB, in the latter 1970s, as an interactive matrix calculator, was in Fortran. It consisted of rudimentary matrix operations and was built upon two early numerical libraries, LINPACK, for linear algebra computations, and EISPACK, to solve eigenvalue problems.

Commercialization: The program entered commercial status in 1984, when Moler, in conjunction with Jack Little and Steve Bangert, began MathWorks. This release marked an extensive revision, as it was fully implemented in C and considerably increased in features, including user-defined functions, toolboxes, and graphical user interfaces, significantly broadening the ways in which it could be utilized.

Expansion through Toolboxes: Until the late 1980s, MATLAB had expanded considerably beyond its original limits. The introduction of toolboxes enabled having specialist applications in signal processing and control systems, and others. At this point, MathWorks also added Simulink, which also became a graphical environment to model and simulate in a dynamic state systems.

Recent Advances: Since its past updates, MATLAB has also evolved to meet researchers', engineers', and educators' needs as it advances in this direction. New versions have added capabilities, including the Live Editor, which supports combining code, visualizations, and descriptive text in interactive documents. These advances demonstrate how MATLAB has been evolving to become an adaptable infrastructure supporting both research in academics and industrial practice.

2 CHAPTER 2: STUDY METHODOLOGY

2.1 Introduction

It is one of the core competencies in engineering and data science to effectively process and organize data. Powerful tools in MATLAB can import, organize, analyze, and export datasets.

For number one we were provided, in this assignment, a dataset downloaded from Kaggle. It was multi-year water pollution and disease case data. The core assignment was to convert this dataset to an organized format, easily manipulable, analyzable, and retainable for future reference.

The objectives were:

- To read the dataset into MATLAB as a table.
- To split the data into tables for each year.
- To convert these tables into arrays and export them into a single Excel file, with each year stored in a separate sheet.
- To store student descriptive information into a single variable for saving.

This assignment familiarized us with practical data management in MATLAB, and it outlined future uses in visualization and in statistics.

We were able to import, retrieve data from Kaggle.com website, importing it to MATLAB, converting tables in to structural arrays, outputting variables in to a single workbook with each year on separate sheets having clear column headings and sheet names.

2.1.1 Steps involved in obtaining the Kaggle data

Step1: Search for kaggle.com using internet search engine such as Google.

Step2: Create an account either using your Google e-mail or other option you are given and then log into your account.

Step3: Go to main page (dataset or notebook), scroll through or search for the document of your desire (topic of study).

Step4: Look for download button which is shown as downward arrow and tap on it.

Step5: A zip file containing .csv and .pdf will download directly to your computer.

2.2 Design Process

1. We organized several meetings during our available time where we went through lecture notes and modules to come up with possible lines of code to put in our script.
2. We then took time to share our personal information regarding our student lives, education, interests and religious leaning.
3. We inquired from other groups about their progress and refined some of ideas from them.
4. The code for both numbers was written down
5. Debugging was done in the presence of all members that were available to get a better understanding of how it worked.

3 CHAPTER 3: METHODOLOGY

3.1 NUMBER 1

3.1.1 Extracting the table from the file

Here we used "*readtable*(" function to import the dataset

```
wpmain = readtable("water_pollution_disease.csv","ReadVariableNames",true);

disp(wpmain);
```

3.1.2 Separating data for each year into different tables

The dataset included data across multiple years. Using logical indexing, data corresponding to each year was separated into individual tables

```
wp_2000 = wpmain(wpmain.Year == 2000, :);

wp_2001 = wpmain(wpmain.Year == 2001, :);

wp_2002 = wpmain(wpmain.Year == 2002, :);

wp_2003 = wpmain(wpmain.Year == 2003, :);

wp_2004 = wpmain(wpmain.Year == 2004, :);

wp_2005 = wpmain(wpmain.Year == 2005, :);

wp_2006 = wpmain(wpmain.Year == 2006, :);

wp_2007 = wpmain(wpmain.Year == 2007, :);

wp_2008 = wpmain(wpmain.Year == 2008, :);

wp_2009 = wpmain(wpmain.Year == 2009, :);

wp_2010 = wpmain(wpmain.Year == 2010, :);

wp_2011 = wpmain(wpmain.Year == 2011, :);

wp_2012 = wpmain(wpmain.Year == 2012, :);

wp_2013 = wpmain(wpmain.Year == 2013, :);

wp_2014 = wpmain(wpmain.Year == 2014, :);

wp_2015 = wpmain(wpmain.Year == 2015, :);

wp_2016 = wpmain(wpmain.Year == 2016, :);

wp_2017 = wpmain(wpmain.Year == 2017, :);
```

```
wp_2018 = wpmain(wpmain.Year == 2018, :);

wp_2019 = wpmain(wpmain.Year == 2019, :);

wp_2020 = wpmain(wpmain.Year == 2020, :);

wp_2021 = wpmain(wpmain.Year == 2021, :);

wp_2022 = wpmain(wpmain.Year == 2022, :);

wp_2023 = wpmain(wpmain.Year == 2023, :);

wp_2024 = wpmain(wpmain.Year == 2024, :);
```

3.1.3 Constructing strucutural arrays for each year

The tables were then converted into arrays using `table2array`.

```
wp_2000_a = table2struct(wp_2000);

wp_2001_a = table2struct(wp_2001);

wp_2002_a = table2struct(wp_2002);

wp_2003_a = table2struct(wp_2003);

wp_2004_a = table2struct(wp_2004);

wp_2005_a = table2struct(wp_2005);

wp_2006_a = table2struct(wp_2006);

wp_2007_a = table2struct(wp_2007);

wp_2008_a = table2struct(wp_2008);

wp_2009_a = table2struct(wp_2009);

wp_2010_a = table2struct(wp_2010);

wp_2011_a = table2struct(wp_2011);

wp_2012_a = table2struct(wp_2012);

wp_2013_a = table2struct(wp_2013);

wp_2014_a = table2struct(wp_2014);

wp_2015_a = table2struct(wp_2015);

wp_2016_a = table2struct(wp_2016);

wp_2017_a = table2struct(wp_2017);
```

```
wp_2018_a = table2struct(wp_2018);

wp_2019_a = table2struct(wp_2019);

wp_2020_a = table2struct(wp_2020);

wp_2021_a = table2struct(wp_2021);

wp_2022_a = table2struct(wp_2022);

wp_2023_a = table2struct(wp_2023);

wp_2024_a = table2struct(wp_2024);
```

3.1.4 Converting the arrays into tables for export

```
wp_2000_2 = struct2table(wp_2000_a);

wp_2001_2 = struct2table(wp_2001_a);

wp_2002_2 = struct2table(wp_2002_a);

wp_2003_2 = struct2table(wp_2003_a);

wp_2004_2 = struct2table(wp_2004_a);

wp_2005_2 = struct2table(wp_2005_a);

wp_2006_2 = struct2table(wp_2006_a);

wp_2007_2 = struct2table(wp_2007_a);

wp_2008_2 = struct2table(wp_2008_a);

wp_2009_2 = struct2table(wp_2009_a);

wp_2010_2 = struct2table(wp_2010_a);

wp_2011_2 = struct2table(wp_2011_a);

wp_2012_2 = struct2table(wp_2012_a);

wp_2013_2 = struct2table(wp_2013_a);

wp_2014_2 = struct2table(wp_2014_a);

wp_2015_2 = struct2table(wp_2015_a);

wp_2016_2 = struct2table(wp_2016_a);

wp_2017_2 = struct2table(wp_2017_a);
```

```
wp_2018_2 = struct2table(wp_2018_a);

wp_2019_2 = struct2table(wp_2019_a);

wp_2020_2 = struct2table(wp_2020_a);

wp_2021_2 = struct2table(wp_2021_a);

wp_2022_2 = struct2table(wp_2022_a);

wp_2023_2 = struct2table(wp_2023_a);

wp_2024_2 = struct2table(wp_2024_a);
```

3.1.5 Output of each of the variables into a single workbook with each year on separate worksheets

```
writetable(wp_2000_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2000","WriteVariableNames",true);

writetable(wp_2001_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2001","WriteVariableNames",true);

writetable(wp_2002_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2002","WriteVariableNames",true);

writetable(wp_2003_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2003","WriteVariableNames",true);

writetable(wp_2004_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2004","WriteVariableNames",true);

writetable(wp_2005_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2005","WriteVariableNames",true);

writetable(wp_2006_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2006","WriteVariableNames",true);

writetable(wp_2007_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2007","WriteVariableNames",true);

writetable(wp_2008_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2008","WriteVariableNames",true);

writetable(wp_2009_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2009","WriteVariableNames",true);

writetable(wp_2010_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2010","WriteVariableNames",true);
```

```
writetable(wp_2011_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2011","WriteVariableNames",true);

writetable(wp_2012_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2012","WriteVariableNames",true);

writetable(wp_2013_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2013","WriteVariableNames",true);

writetable(wp_2014_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2014","WriteVariableNames",true);

writetable(wp_2015_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2015","WriteVariableNames",true);

writetable(wp_2016_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2016","WriteVariableNames",true);

writetable(wp_2017_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2017","WriteVariableNames",true);

writetable(wp_2018_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2018","WriteVariableNames",true);

writetable(wp_2019_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2019","WriteVariableNames",true);

writetable(wp_2020_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2020","WriteVariableNames",true);

writetable(wp_2021_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2021","WriteVariableNames",true);

writetable(wp_2022_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2022","WriteVariableNames",true);

writetable(wp_2023_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2023","WriteVariableNames",true);

writetable(wp_2024_2,"Water Pollution Assignment 1
output.xlsx","Sheet","2024","WriteVariableNames",true)
```

This created a well-structured output file where each sheet represented a year with proper column headings.

3.2 NUMBER TWO
Group 19 Member Data

3.2.1 Entry of Data
A MATLAB struct was used to store details of group members:

3.2.1.1 Student 1
```
Member(1).Name = 'NTALE JOASH';

Member(1).Age = 20;

Member(1).DOB = datetime(2005,2,6);

Member(1).SEX = 'M';

Member(1).Course = 'WAR';

Member(1).Registration_Number = 'BU/UG/2024/2595';

Member(1).Facial_Representation = imread("NTALE.jpg");

Member(1).Religion = 'ANGLICAN';

Member(1).Nationality = 'UGANDAN';

Member(1).Region = 'CENTRAL';

Member(1).Home_District = 'WAKISO';

Member(1).Village = 'LUWEERO';

Member(1).Interest = 'VIDEO GAMES';
```

3.2.1.2 Student 2
```
Member(2).Name = 'OKORI DARIOUS';

Member(2).Age = 21;

Member(2).DOB = datetime(2003,11,11);

Member(2).SEX = 'M';

Member(2).Course = 'WAR';

Member(2).Registration_Number = 'BU/UP/2024/1061';

Member(2).Facial_Representation = imread("OKORI.jpg");

Member(2).Religion = 'ANGLICAN';
```

```
Member(2).Nationality = 'UGANDAN';

Member(2).Region = 'NORTHERN';

Member(2).Home_District = 'KOLE';

Member(2).Village = 'TE ABOLO';

Member(2).Interest = 'FOOTBALL';
```

3.2.1.3 Student 3

```
Member(3).Name = 'KAKULU ALFRED';

Member(3).Age = 23;

Member(3).DOB = datetime(2003,7,5);

Member(3).SEX = 'M';

Member(3).Course = 'MEB';

Member(3).Registration_Number = 'BU/UP/2024/0981';

Member(3).Facial_Representation = imread("KAKULU.jpg");

Member(3).Religion = 'ANGLICAN';

Member(3).Nationality = 'UGANDAN';

Member(3).Region = 'CENTRAL';

Member(3).Home_District = 'WAKISO';

Member(3).Village = 'NABBINGO';

Member(3).Interest = 'FOOTBALL';
```

3.2.1.4 Student 4

```
Member(4).Name = 'MAATE PHILEMON';

Member(4).Age = 22;

Member(4).DOB = datetime(2002,12,19);

Member(4).SEX = 'M';

Member(4).Course = 'AMI';

Member(4).Registration_Number = 'BU/UP/2024/0830';

Member(4).Facial_Representation = imread("MAATE.jpg");
```

```
Member(4).Religion = 'SDA';

Member(4).Nationality = 'UGANDAN';

Member(4).Region = 'WESTERN';

Member(4).Home_District = 'KASESE';

Member(4).Village = 'KYANDULI';

Member(4).Interest = 'BUSINESS';
```

3.2.1.5 Student 5

```
Member(5).Name = 'AMASO SUSAN';

Member(5).Age = 23;

Member(5).DOB = datetime(2002,4,7);

Member(5).SEX = 'F';

Member(5).Course = 'PTI';

Member(5).Registration_Number = 'BU/UP/2025/5435';

Member(5).Facial_Representation = imread("AMASO.jpg");

Member(5).Religion = 'CATHOLIC';

Member(5).Nationality = 'UGANDAN';

Member(5).Region = 'EASTERN';

Member(5).Home_District = 'AMURIA';

Member(5).Village = 'ODEKERE';

Member(5).Interest = 'SINGING';
```

3.2.1.6 Student 6

```
Member(6).Name = 'ALITEMA VICTOR';

Member(6).Age = 25;

Member(6).DOB = datetime(2000,12,19);

Member(6).SEX = 'M';

Member(6).Course = 'WAR';

Member(6).Registration_Number = 'BU/UP/2024/5098';
```

```
Member(6).Facial_Representation = imread("ALITEMA.jpg");

Member(6).Religion = 'CATHOLIC';

Member(6).Nationality = 'UGANDAN';

Member(6).Region = 'WEST NILE';

Member(6).Home_District = 'ARUA';

Member(6).Village = 'ACIVU';

Member(6).Interest = 'EXCELLENCE';
```

3.2.1.7 Student 7

```
Member(7).Name = 'OKWI NICHOLAS';

Member(7).Age = 21;

Member(7).DOB = datetime(2004,10,9);

Member(7).SEX = 'M';

Member(7).Course = 'WAR';

Member(7).Registration_Number = 'BU/UP/2024/4457';

Member(7).Facial_Representation = imread("OKWI.jpg");

Member(7).Religion = 'BORN AGAIN';

Member(7).Nationality = 'UGANDAN';

Member(7).Region = 'EASTERN';

Member(7).Home_District = 'BUKEDEA';

Member(7).Village = 'KACHUMBALA';

Member(7).Interest = 'MUSIC';
```

3.2.1.8 Student 8

```
Member(8).Name = 'SIKUKU BELIZER RUTH';

Member(8).Age = 21;

Member(8).DOB = datetime(2003,12,27);

Member(8).SEX = 'F';

Member(8).Course = 'AMI';
```

```
Member(8).Registration_Number = 'BU/UP/2024/0846';

Member(8).Facial_Representation = imread("SIKUKU.jpg");

Member(8).Religion = 'ANGLICAN';

Member(8).Nationality = 'UGANDAN';

Member(8).Region = 'EASTERN';

Member(8).Home_District = 'KWEEN';

Member(8).Village = 'CHEMWANIA';

Member(8).Interest = 'FOOD';
```

3.2.1.9 Student 9

```
Member(9).Name = 'WANYAMA JOSEPH EROGO';

Member(9).Age = 21;

Member(9).DOB = datetime(2004,9,13);

Member(9).SEX = 'M';

Member(9).Course = 'WAR';

Member(9).Registration_Number = 'BU/UP/2024/1077';

Member(9).Facial_Representation = imread("WANYAMA.jpg");

Member(9).Religion = 'ANGLICAN';

Member(9).Nationality = 'UGANDAN';

Member(9).Region = 'CENTRAL';

Member(9).Home_District = 'WAKISO';

Member(9).Village = 'MUNYONYO';

Member(9).Interest = 'BASKETBALL'
```

The struct was then saved using "*save*"

4 RESULTS AND CONCLUSIONS

The dataset was successfully imported and separated by years. Each year's data was organized into a clean table and converted into arrays. These were exported into an Excel workbook with clearly labeled sheets.

The process demonstrated the usefulness of MATLAB in handling large datasets efficiently. The struct variable containing group member attributes provided a compact way of storing information, which could later be returned for statistical or visual analysis.

Challenges faced included heavy amount of data that made dealing with separation into years quite difficult. We also struggled with how to import an image under the facial recognition column in the struct but eventually overcame with perseverance.

5 REFERENCES

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