

**BUSITEMA
UNIVERSITY**

Faculty of Engineering & Technology
Group J

MATLAB Group Assignment
Mr. Ben Maseruka

Group J

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Group J

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Exercise 1

Retrieve a unique data set from kaggle.com in Excel format.

Write a single MATLAB script to:

1. Read the dataset into MATLAB
2. Copy variables for each year
3. Display data for each year in separate tables
4. Convert the tables from (3) into structural arrays
5. Output the variables from the structural arrays into one Excel workbook and separate sheets for data of each year with clear column headings

In simple terms



Group J

Exercise 1

Exercise 2

Each group has different members from different backgrounds, home districts , religions , tribes , villages, courses , interests, ages, names and facial representations.

Write a MATLAB code that can store each members attributes into a single variable. Ensure the code saves the value.

Group J

Exercise 2

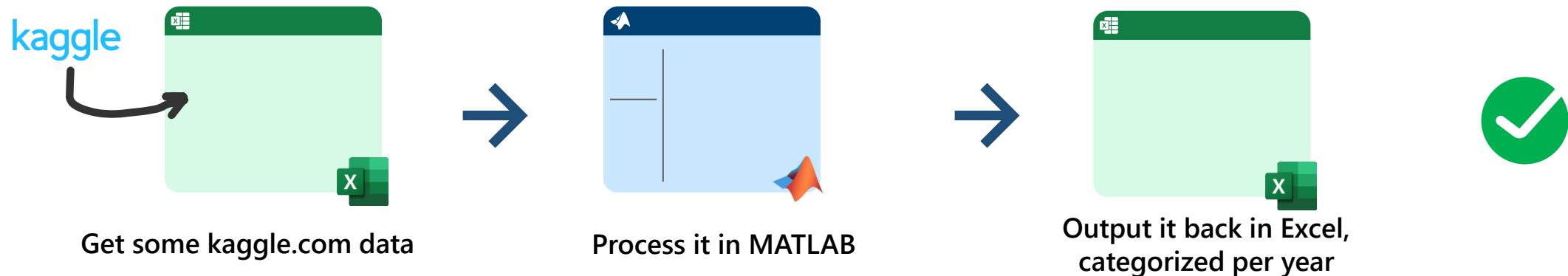
Exercise 1

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In simple terms

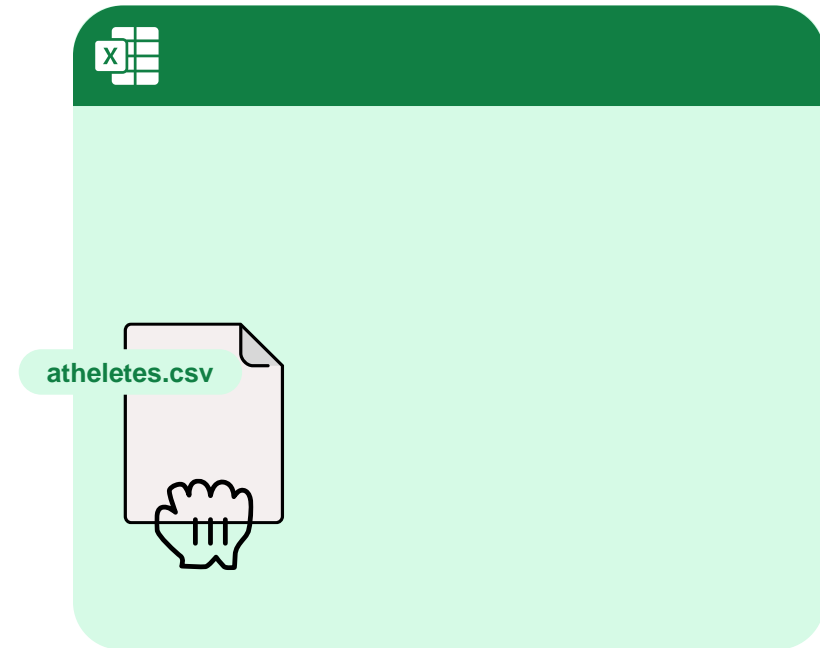


Our task for Exercise 1

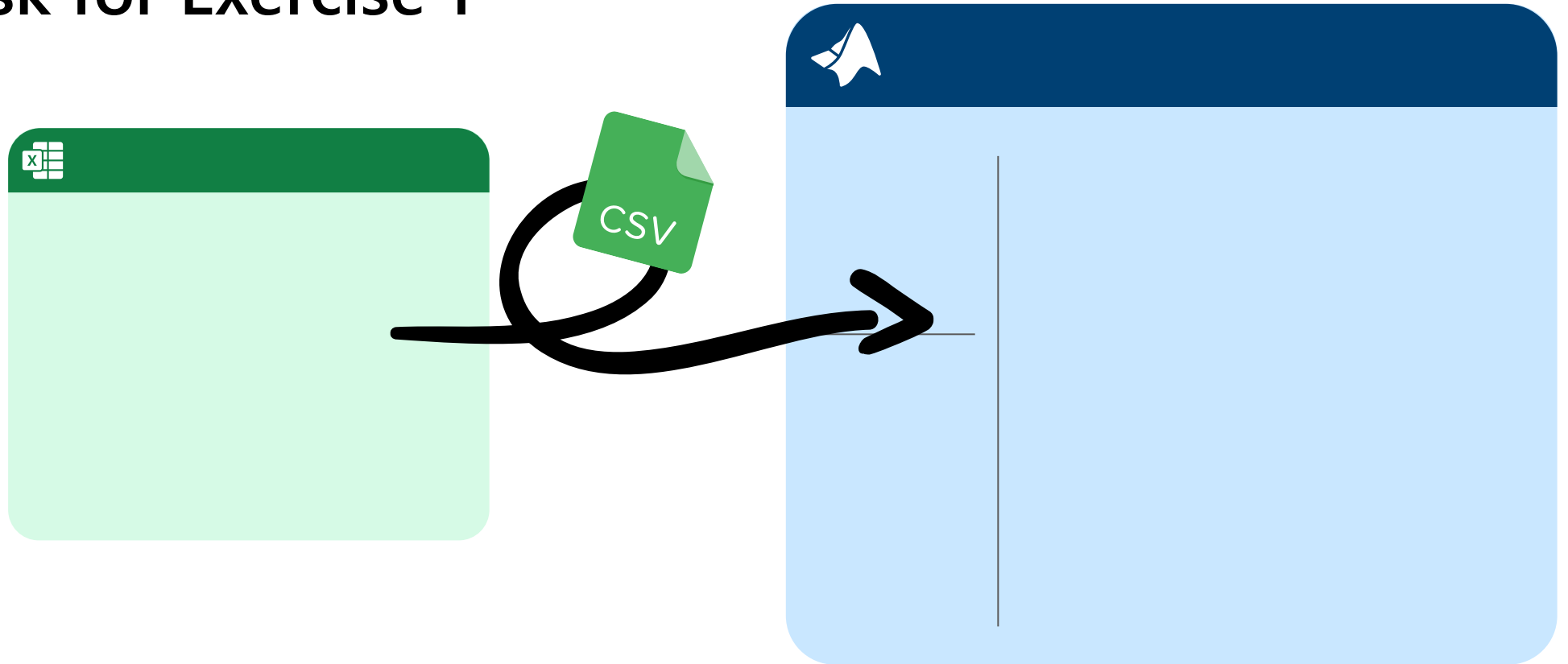
kaggle

First get a dataset
from [kaggle.com](https://www.kaggle.com) in
Excel format

We cleaned it to
remove missing
values and errors



Our task for Exercise 1



Import the excel file into MATLAB for processing using a script

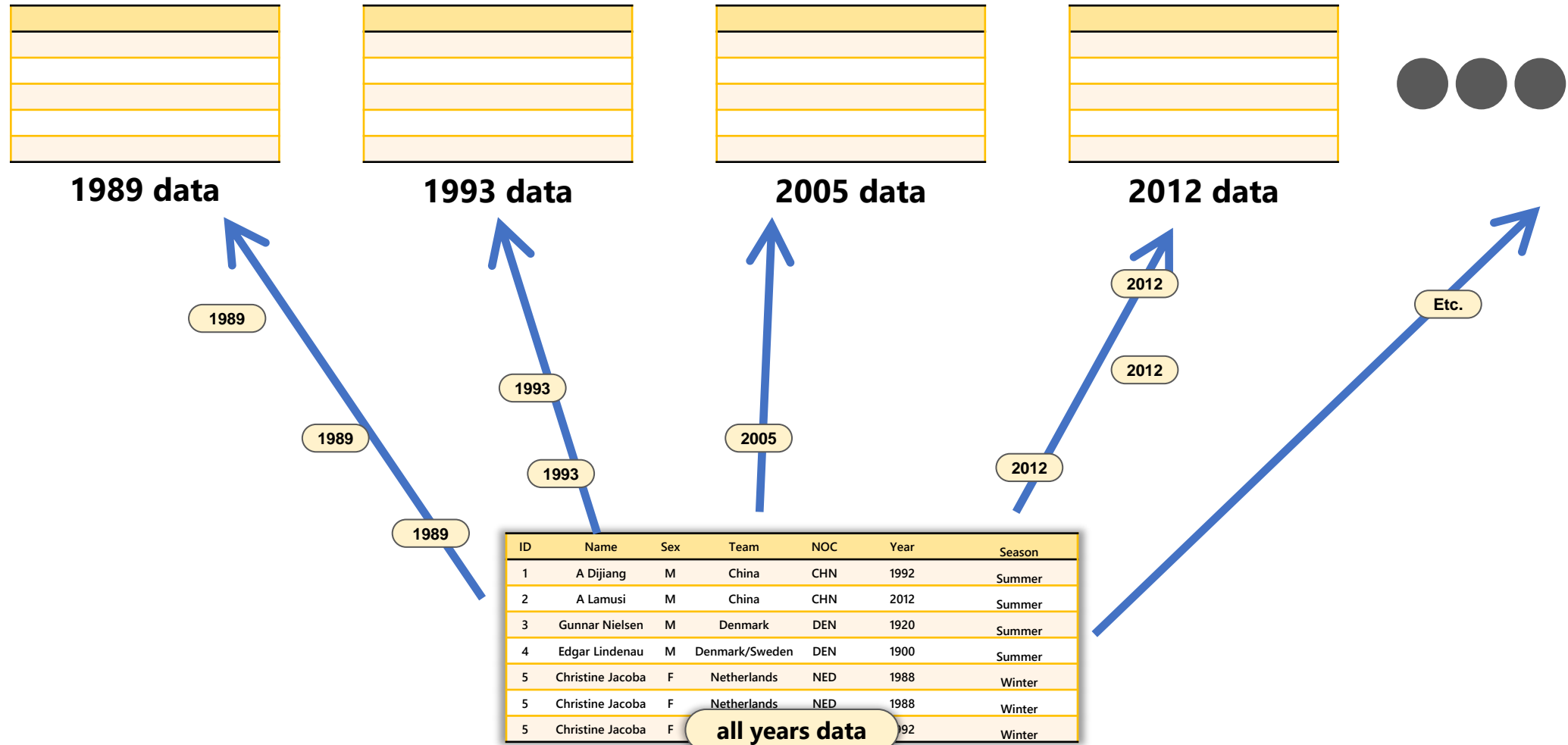
Our task for Exercise 1

Part of **athletes.csv**

ID	Name	Sex	Team	NOC	Year	Season
1	A Dijiang	M	China	CHN	1992	Summer
2	A Lamusi	M	China	CHN	2012	Summer
3	Gunnar Nielsen	M	Denmark	DEN	1920	Summer
4	Edgar Lindenau	M	Denmark/Sweden	DEN	1900	Summer
5	Christine Jacoba	F	Netherlands	NED	1988	Winter
5	Christine Jacoba	F	Netherlands	NED	1988	Winter
5	Christine Jacoba	F	Netherlands	NED	1992	Winter

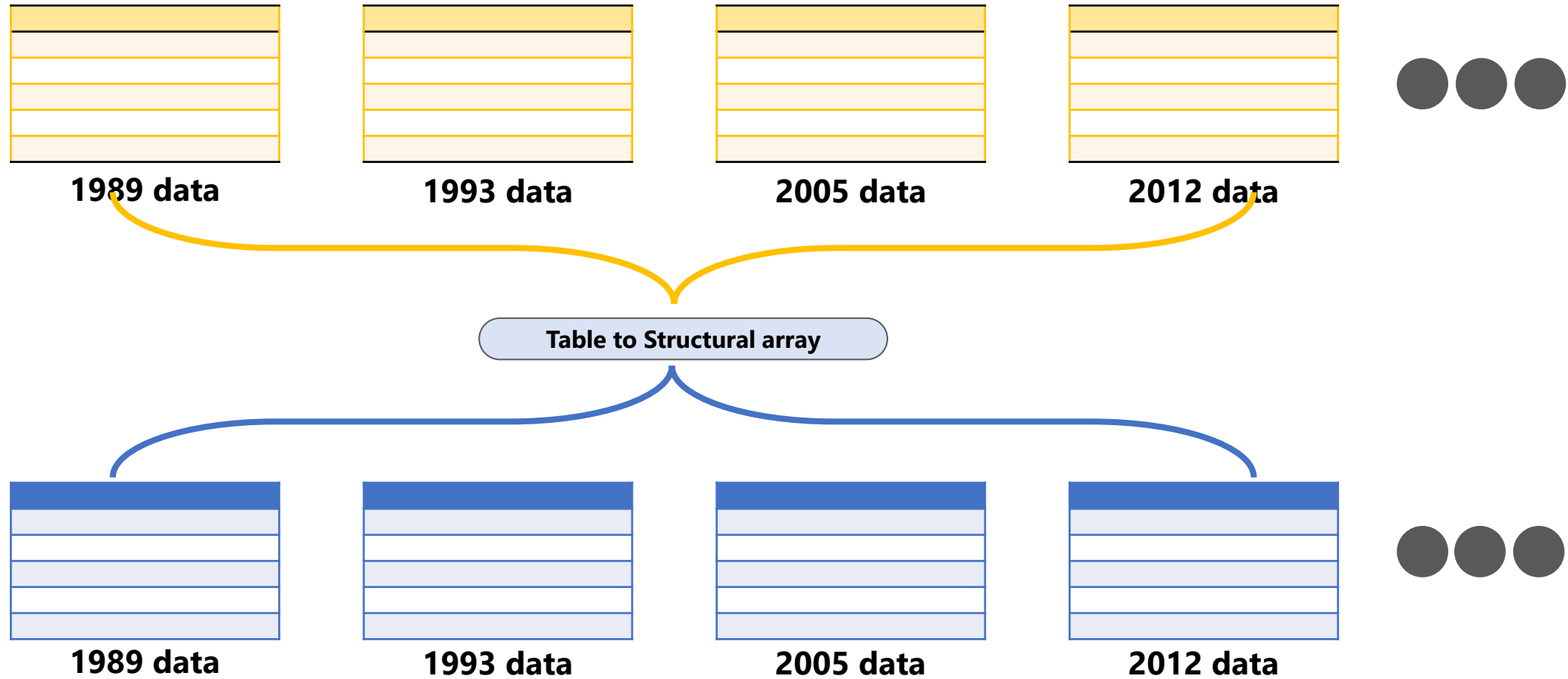
Sort them by the Year value and isolate the records of data by Year ...

Our task for Exercise 1



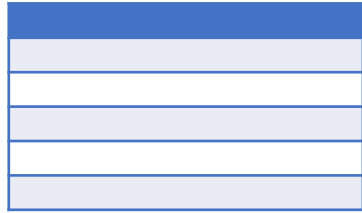
Put each year's data records into separate respective tables

Our task for Exercise 1

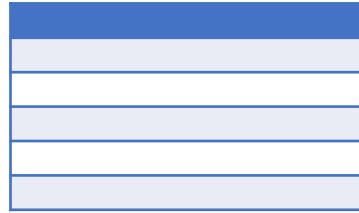


Convert the tables to structural arrays

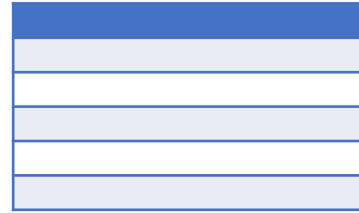
Our task for Exercise 1

A small icon representing a table with a blue header row and five light blue data rows.

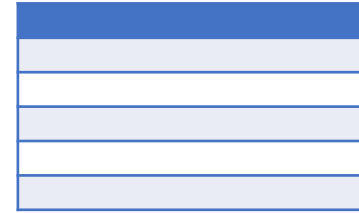
1989 data

A small icon representing a table with a blue header row and five light blue data rows.

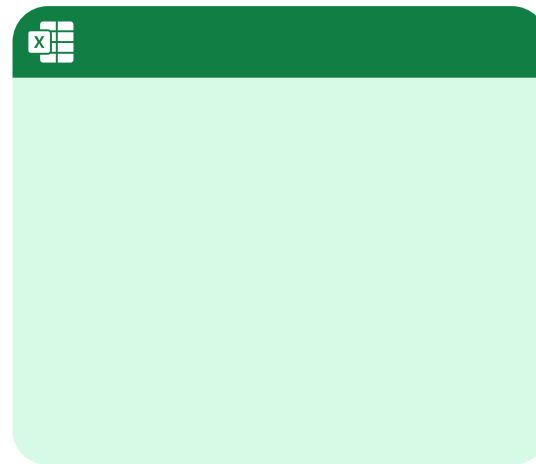
1993 data

A small icon representing a table with a blue header row and five light blue data rows.

2005 data

A small icon representing a table with a blue header row and five light blue data rows.

2012 data



Add each year's data into an Excel workbook, with separate sheets for each year

Our code for Exercise 1

```
1 % Input and output file paths
2 kaggle_data_file = "C:\Users\Cp9-30\Desktop\exercise one\athlete_events.csv";
3 output_file = "C:\Users\Cp9-30\Desktop\exercise one\output.xlsx";
4
5 % Load data and initialize structure
6 kaggle_data = readtable(kaggle_data_file);
7 struct_arrays = struct();
8 unique_years = unique(kaggle_data.Year);
9
10 % Process data for each year
11 for i = 1:length(unique_years)
12     year = unique_years(i);
13     year_data = kaggle_data(kaggle_data.Year == year, :);
14     currentYear = sprintf('Year_%d', year);
15
16     % Store data in struct and Excel
```

Our code for Exercise 1

```
1 % Input and output file paths
2 kaggle_data_file = "C:\Users\Cp9-30\Desktop\exercise one\athlete_events.csv";
3 output_file = "C:\Users\Cp9-30\Desktop\exercise one\output.xlsx";
4
```

Here we setup the files we will utilize by declaring their paths in the local computer where our MATLAB environment is installed

Our code for Exercise 1

```
5 % Load data and initialize structure
6 kaggle_data = readtable(kaggle_data_file);
7 struct_arrays = struct();
8 unique_years = unique(kaggle_data.Year);
9
```

Here we load the dataset as a table in line 6

Create the empty parent structural array in line 7

And create an array of the unique years in our dataset

Our code for Exercise 1

```
10 % Process data for each year
11 for i = 1:length(unique_years)
12     year = unique_years(i);
13     year_data = kaggle_data(kaggle_data.Year == year, :);
14     currentYear = sprintf('Year_%d', year);
15
16     % Store data in struct and Excel
17     S = table2struct(year_data);
18     struct_arrays(i).(currentYear) = S;
19     writetable(year_data, output_file, 'Sheet', currentYear);
20 end
21
```

Our code for Exercise 1

This block of code runs the loop that performs the core operation

For each year; it runs through the dataset and picks out rows that have that year, saves them to a new filtered table, converts the table to a structural array and puts the array into a sheet in Excel

Until all years are done through!

```
10 % Process data for each year
11 for i = 1:length(unique_years)
12     year = unique_years(i);
13     year_data = kaggle_data(kaggle_data.Year == year);
14     currentYear = sprintf('Year_%d', year);
15
16     % Store data in struct and Excel
17     S = table2struct(year_data);
18     struct_arrays(i).(currentYear) = S;
19     writetable(year_data, output_file, 'Sheet_' + currentYear);
20 end
21
```


Our code for Exercise 1

```
22 % Display results
23 disp('Loop finished. Displaying the final struct:');
24 disp(struct_arrays);
25 disp('All field names in the struct:');
26 disp(fieldnames(struct_arrays));
27 disp('Data has been written to Excel file.');
```

This part of the code displays the result to the console simply for verification

Our result for Exercise 1

output - Excel

File Home Tell me what you want to do

Share

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	ID	Athlete	Gender	Age	Height	Weight	Country	Code	Year	Season	City		
2	7750	Ren Barbi	M	37	175	70	France	FRA	1928	Summer	Amsterdam		
3	8251	Hugo Bart	M	24	176	78	Germany	GER	1928	Summer	Amsterdam		
4	16268	Jzef Bujak	M	29	168	70	Poland	POL	1928	Winter	Sankt Moritz		
5	16268	Jzef Bujak	M	29	168	70	Poland	POL	1928	Winter	Sankt Moritz		
6	25928	Jean De E	M	36	184	80	Belgium	BEL	1928	Summer	Amsterdam		
7	36400	Czesaw F	M	23	176	68	Poland	POL	1928	Summer	Amsterdam		
8	50704	Erwin Hub	M	21	180	80	Germany	GER	1928	Summer	Amsterdam		
9	50909	Fritz Huhn	M	27	168	65	Germany	GER	1928	Summer	Amsterdam		
10	53754	Joko Ja	M	27	168	67	Yugoslavia	YUG	1928	Winter	Sankt Moritz		
11	53754	Joko Ja	M	27	168	67	Yugoslavia	YUG	1928	Winter	Sankt Moritz		
12	62002	Otto Kohn	M	20	172	65	Germany	GER	1928	Summer	Amsterdam		
13	62672	Fritz Kpke	M	26	180	78	Germany	GER	1928	Summer	Amsterdam		
14	62952	Jozef Koa	M	24	172	70	Czechoslovakia	TCH	1928	Summer	Amsterdam		
15	65624	Karl Laas	M	20	164	60	Estonia	EST	1928	Summer	Amsterdam		
16	66428	Jzef Lange	M	31	165	70	Poland	POL	1928	Summer	Amsterdam		
17	66428	Jzef Lange	M	31	165	70	Poland	POL	1928	Summer	Amsterdam		
18	72136	Olaf Luiga	M	19	178	85	Estonia	EST	1928	Summer	Amsterdam		

1904 1906 1908 1912 1920 1924 1928

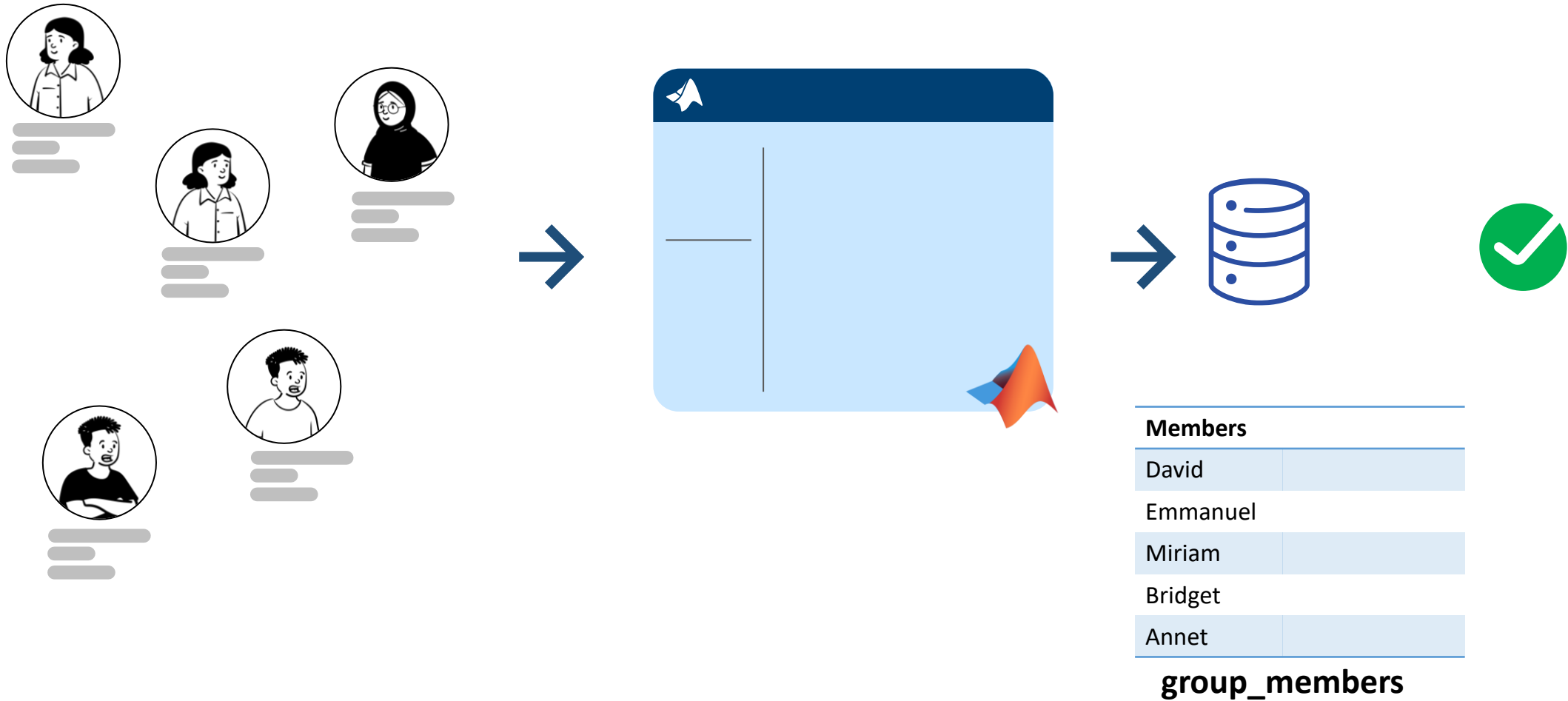
100%

Exercise 2

Each group has different members from different backgrounds, home districts , religions , tribes , villages, courses , interests, ages, names and facial representations.

Write a MATLAB code that can store each members attributes into a single variable. Ensure the code saves the value.

Our task for Exercise 2



Our code for Exercise 2

```
%designingstruct
members=struct('name', {}, 'age', {}, 'course', {}, 'district', {}, 'tribe', {},
'village', {}, 'religion', {}, 'interest', {}, 'facialrepresentation', {});

%member(1)
members(1).name='gift_emmanuel';
members(1).age='20';
members(1).course='war';
members(1).district='koboko';
members(1).tribe='kakwa';
members(1).village='keri';
members(1).religion='anglican';
members(1).interest='prayers';
members(1).facialrepresentation=imread('ngc6543a.jpg');

%members(2)
members(2).name='ahaisibwe_christopher';
members(2).age='22';
members(2).course='ami';
members(2).district='wakiso';
members(2).tribe='munyankole';
members(2).village='bujjuuko';
members(2).religion='catholic';
members(2).interest='swimming';
members(2).faci

%members(3)
members(3).name='...';
members(3).age='21';
```



Continues for every member

Our code for Exercise 2

```
1 %%designingstruct
2 members=struct('name',{},'age',{},'course',{},'district',{},'tribe',{},'village',{},'religion',{},'interest',
  {},'facialrepresentation',{});
3
```

In these lines, we create an empty structural array to contain all the members' attributes; we create the field labels as well to have it store the different attributes we are interested in

Our code for Exercise 2

```
3  
4 %member(1)  
5 members(1).name='gift_emmanuel';  
6 members(1).age='20';  
7 members(1).course='war';  
8 members(1).district='koboko';  
9 members(1).tribe='kakwa';  
10 members(1).village='keri';  
11 members(1).religion='anglican';  
12 members(1).interest='prayers';  
13 members(1).facialrepresentation=imread('ngc6543a.jpg');  
14
```

Our code for Exercise 2

This portion of the code enters the attributes of one member of the group.

And stores them appropriately in the fields of the struct where they belong.

The rest of the code, does the same; for the different members

```
3
4 %member(1)
5 members(1).name='gifi'
6 members(1).age='20';
7 members(1).course='w'
8 members(1).district=
9 members(1).tribe='ka
10 members(1).village='
11 members(1).religion=
12 members(1).interest=
13 members(1).facialrep
14
```


Our result for Exercise 2

The image shows the MATLAB R2024a interface. The main window displays a 1x20 struct array named 'members' with 9 fields. The fields are: name, age, course, district, tribe, village, religion, interest, and facialrepresentation. The data is as follows:

Fields	name	age	course	district	tribe	village	religion	interest	facialrepresentation
1	'gift_emma...	'20'	'war'	'koboko'	'kakwa'	'keri'	'anglican'	'prayers'	650x600x3 uint8
2	'ahaisibwe_...	'22'	'ami'	'wakiso'	'munyankole'	'bujjuuko'	'catholic'	'swimming'	650x600x3 uint8
3	'arach_glad...	'21'	'war'	'gulu'	'acholi'	'bardege'	[]	'music'	650x600x3 uint8
4	'adwong_ca...	'22'	'meb'	'tororo'	'japadhola'	'paya'	'born_again'	'basketball'	650x600x3 uint8
5	'rose_miriam'	'22'	'war'	'trinyi'	'bugwere'	'kibuku'	'pentacostal'	'dancing'	650x600x3 uint8
6	'posh'	'23'	'war'	'tororo'	'japadhola'	'kisoko'	'catholic'	'gaming'	650x600x3 uint8
7	'amaso_sus...	'23'	'pti'	'amuria'	'iteso'	'odekere'	'catholic'	'learning'	650x600x3 uint8
8	'opoka_vinc...	'22'	'ami'	'lamwo'	'acholi'	'lugu'	'catholic'	'football'	650x600x3 uint8
9	'ahereza_fai...	'22'	'ape'	'isingiro'	'munyankole'	'watching'	'anglican'	'music'	650x600x3 uint8
10	'wangusi_d...	'21'	'meb'	'busia'	'samia'	'mayombe'	'catholic'	'football'	650x600x3 uint8
11	'twale_josh...	'2'	'ape'	'mbale'	'gishu'	'namakwek...	'catholic'	'football'	650x600x3 uint8
12	'acipa_brid...	'21'	'war'	'lira'	'langi'	'bardege'	'catholic'	'music'	650x600x3 uint8
13	'oule_saddo...	'22'	'meb'	'busia'	'samia'	'bukedi'	'catholic'	'travelling'	650x600x3 uint8
14	'nabukeera_...	'21'	'ami'	'jinja'	'musoga'	'town'	'catholic'	'reading'	650x600x3 uint8
15	'muvubya_...	'23'	'war'	'kampala'	'mugandan'	'busega'	'born_again'	'prayers'	650x600x3 uint8
16	'akello_barb...	'22'	'war'	'busia'	'samia'	'shaule'	'catholic'	'business'	650x600x3 uint8
17	'atati_edwine'	'25'	'ami'	'maracha'	'lugbara'	'nyandi'	'anglican'	'gym'	650x600x3 uint8
18	'ocaa_eli'	'21'	'war'	'lira'	'langi'	'town'	'catholic'	'singimg'	650x600x3 uint8
19	'awene_sol...	'24'	'war'	'lira'	'langi'	'bardege'	'catholic'	'riding'	650x600x3 uint8
20	'buluma_da...	'23'	'ami'	'busia'	'samia'	'nvandi'	'anagican'	'readin'	650x600x3 uint8

Our result for Exercise 2

members										
1x20 struct with 9 fields										
Fields	name	age	course	district	tribe	village	religion	interest	facialrepresentation	
1	'gift_emma...	'20'	'war'	'koboko'	'kakwa'	'keri'	'anglican'	'prayers'	650x600x3 uint8	
2	'ahaisibwe_...	'22'	'ami'	'wakiso'	'munyankole'	'bujjuuko'	'catholic'	'swimming'	650x600x3 uint8	
3	'arach_glad...	'21'	'war'	'gulu'	'acholi'	'bardege'	[]	'music'	650x600x3 uint8	
4	'adwong_ca...	'22'	'meb'	'tororo'	'japadhola'	'paya'	'born_again'	'basketball'	650x600x3 uint8	
5	'rose_miriam'	'22'	'war'	'trinyi'	'bugwere'	'kibuku'	'pentacostal'	'dancing'	650x600x3 uint8	
6	'posh'	'23'	'war'	'tororo'	'japadhola'	'kisoko'	'catholic'	'gaming'	650x600x3 uint8	
7	'amaso_sus...	'23'	'pti'	'amuria'	'iteso'	'odekere'	'catholic'	'learning'	650x600x3 uint8	
8	'opoka_vinc...	'22'	'ami'	'lamwo'	'acholi'	'lugu'	'catholic'	'football'	650x600x3 uint8	
9	'ahereza_fai...	'22'	'ape'	'isingiro'	'munyankole'	'watching'	'anglican'	'music'	650x600x3 uint8	
10	'wangusi_d...	'21'	'meb'	'busia'	'samia'	'mayombe'	'catholic'	'football'	650x600x3 uint8	
11	'twale_josh...	'2'	'ape'	'mbale'	'gishu'	'namakwek...	'catholic'	'football'	650x600x3 uint8	
12	'acipa_brid...	'21'	'war'	'lira'	'langi'	'bardege'	'catholic'	'music'	650x600x3 uint8	
13	'oule_saddo...	'22'	'meb'	'busia'	'samia'	'bukedi'	'catholic'	'travelling'	650x600x3 uint8	
14	'nabukeera_...	'21'	'ami'	'jinja'	'musoga'	'town'	'catholic'	'reading'	650x600x3 uint8	
15	'muwubya_...	'23'	'war'	'kampala'	'mugandan'	'busega'	'born_again'	'prayers'	650x600x3 uint8	
16	'akello_barb...	'22'	'war'	'busia'	'samia'	'shaule'	'catholic'	'business'	650x600x3 uint8	
17	'atati_edwine'	'25'	'ami'	'maracha'	'lugbara'	'nyandi'	'anglican'	'gym'	650x600x3 uint8	
18	'ocaa_eli'	'21'	'war'	'lira'	'langi'	'town'	'catholic'	'singimg'	650x600x3 uint8	
19	'awene_sol...	'24'	'war'	'lira'	'langi'	'bardege'	'catholic'	'riding'	650x600x3 uint8	
20	'buluma da...	'23'	'ami'	'busia'	'samia'	'nvandi'	'anglican'	'readin'	650x600x3 uint8	

In conclusion

CHALLENGES

- Limited references on the internet
- Disturbances of the eduroam network

ACHIEVEMENTS

- We learnt new academic websites like Kaggle.com
- We had a new knowledge about the use of MATLAB

CONCLUSION

We hope to have a deeper insight on the use of the MATLAB

**We appreciate you
listening**

Group J