But who's COUNTing?

DATA ANALYSIS IN EXCEL

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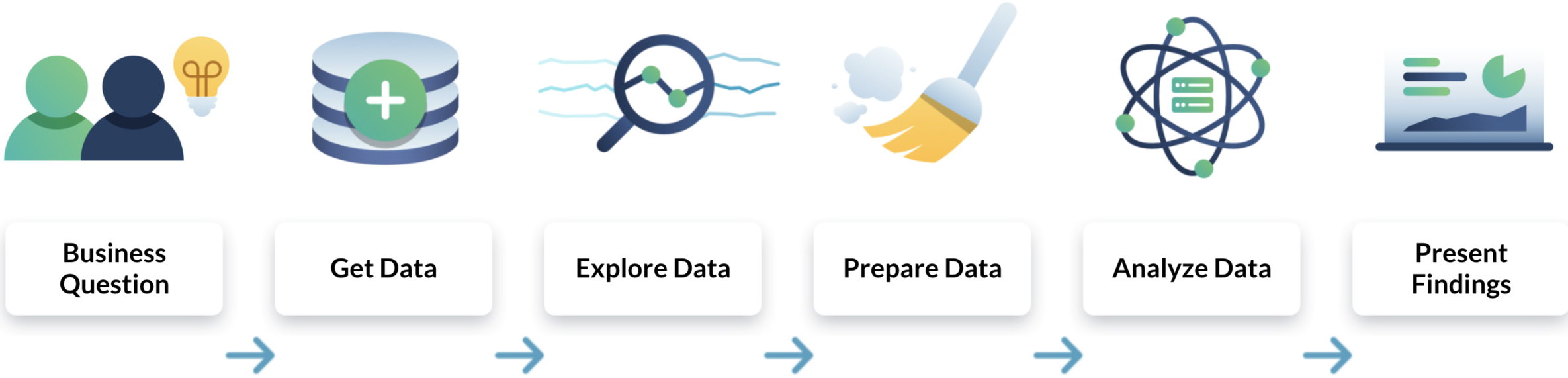
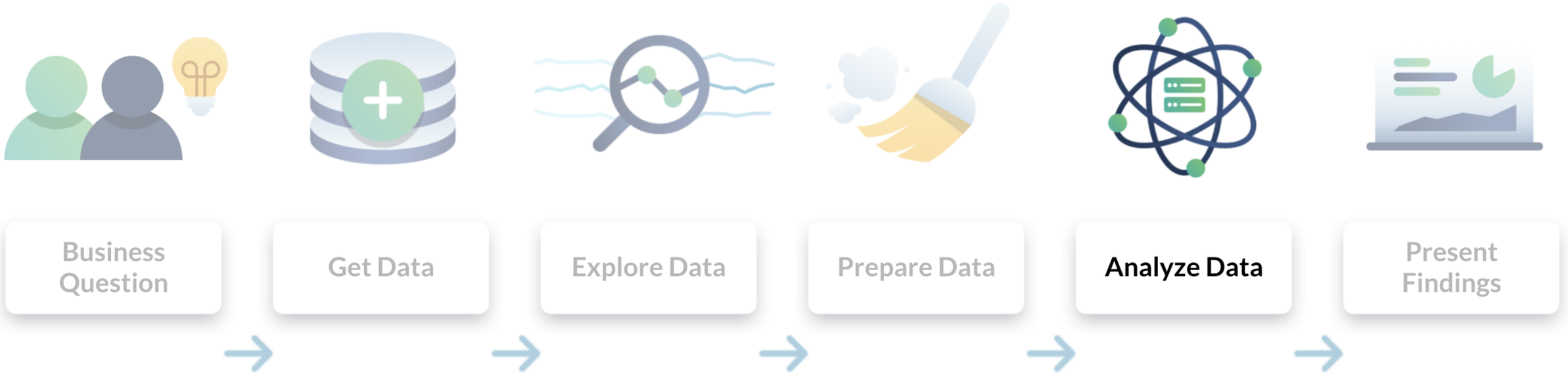
Data analysis process review



Data analysis process review



Counting in Excel

- Count the number of cells
- A few variations of `COUNT()`
  - `COUNT()`
  - `COUNTA()`
  - `COUNTBLANK()`

COUNT() function explained

Counts the number of cells that contains **numeric** values in a range

Syntax:

```
=COUNT(value_range)
```

Example:

```
=COUNT(M2:N11)
```

COUNTA() function explained

Counts all non-blank cells in a range **regardless of data type**

Syntax:

```
=COUNTA(value_range)
```

Example:

```
=COUNTA(M2:N11)
```

COUNTBLANK() function explained

Counts all **blank cells** in a range

Syntax:

```
=COUNTBLANK(value_range)
```

Example:

```
=COUNTBLANK(M2:N11)
```

Notes:

- *Cells with formulas that return* `""` *are counted*
- *Cells with zero values are not counted*

Output

	M	N	O	P	Q	R
1	goal	city		COUNT	COUNTA	COUNTBLANK
2	75000	Salt Lake City		8	19	1
3	90000					
4	75000	Cambridge				
5	50000	Palo Alto				
6	365	Toronto				
7		Reading				
8	50000	Captain Cook				
9	10000					
10	22500	San Diego				
11		Phoenix				

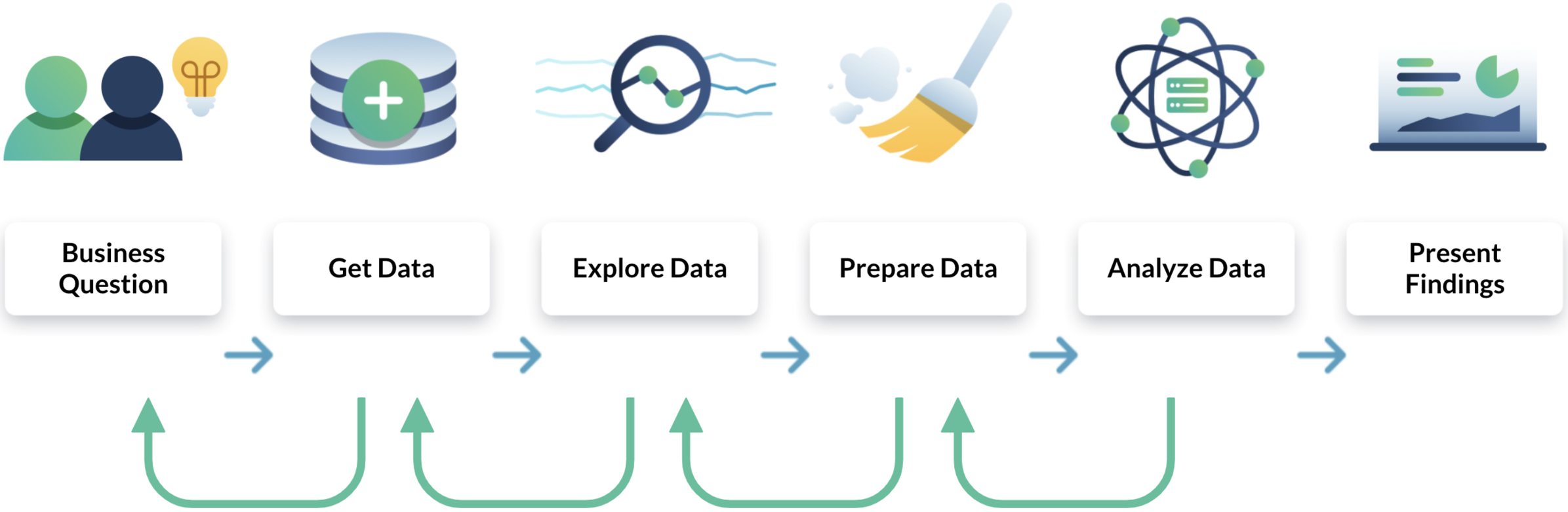
Output

	M	N	O	P	Q	R
1	goal	city		COUNT	COUNTA	COUNTBLANK
2	75000	Salt Lake City		8	19	1
3	90000					
4	75000	Cambridge				
5	50000	Palo Alto				
6	365	Toronto				
7		Reading				
8	50000	Captain Cook				
9	10000					
10	22500	San Diego				
11		Phoenix				

Output

	M	N	O	P	Q	R
1	goal	city		COUNT	COUNTA	COUNTBLANK
2	75000	Salt Lake City		8	16	4
3	90000					
4	75000	Cambridge				
5	50000	Palo Alto				
6	365	Toronto				
7		Reading				
8	50000	Captain Cook				
9	10000					
10	22500	San Diego				
11		Phoenix				

Cleaning data revisited



Let's practice!

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Excel the great calculator

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Performing calculations in Excel

$$2 + 2 = 4$$

Generic syntax

Generic Syntax:

```
=FUNCTION(data_range)
```

	M
1	goal
2	75000
3	90000
4	75000
5	50000
6	365
7	5000
8	50000
9	10000
10	22500
11	50000
12	62000
13	50000

SUM() function

Syntax:

```
=SUM(data_range)
```

Example:

```
=SUM(A2:A104)
```

Notes:

- *Cells that contain text or dates aren't taken into account*
- *There is a difference between* `SUM()` *and* `COUNT()`

	A	B	C
1	goal		SUM
2	75000		11580896
3	90000		
4	75000		
5	50000		
6	365		
7	5000		
8	50000		
9	10000		
10	22500		
11	50000		
12	62000		
13	50000		

MIN() and MAX() functions

Syntax:

`=MIN(data_range)` and `=MAX(data_range)`

Example:

`=MIN(A2:A104)` and `=MAX(A2:A104)`

Notes:

- *If the range doesn't contain any numbers, both of these functions will return zero*

	A	B	C
1	goal		MIN
2	75000		365
3	90000		
4	75000		MAX
5	50000		5000000
6	365		
7	5000		
8	50000		
9	10000		
10	22500		
11	50000		
12	62000		
13	50000		

AVERAGE() function

Syntax:

```
=AVERAGE(data_range)
```

Example:

```
=AVERAGE(A2:A104)
```

Notes:

- *Blank cells will not be included in calculation*

	A	B	C
1	goal		AVERAGE
2	75000		112435.9
3	90000		
4	75000		
5	50000		
6	365		
7	5000		
8	50000		
9	10000		
10	22500		
11	50000		
12	62000		
13	50000		

MEDIAN() function

Syntax:

```
=MEDIAN(data_range)
```

Example:

```
=MEDIAN(A2:A104)
```

Notes:

- *Used as a point of comparison to average*

	A	B	C
1	goal		MEDIAN
2	75000		25000
3	90000		
4	75000		
5	50000		
6	365		
7	5000		
8	50000		
9	10000		
10	22500		
11	50000		
12	62000		
13	50000		

[1] https://www.clinfo.eu/mean-median/

Let's practice!

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Logic functions

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Intro to logic functions

Intro to logic functions

Projects with more than 50 backers

	A
1	backers_count
2	15
3	942
4	1202
5	18
6	7
7	64
8	5
9	9
10	25
11	101
12	1
13	0

Projects from the United Kingdom

	C
1	country
2	United States
3	United States
4	United States
5	United States
6	Canada
7	United Kingdom
8	United States
9	Hong Kong
10	United States
11	United States
12	United States
13	United States

IF() function syntax explained

Syntax:

```
=IF(logical_test, [value_if_true], [value_if_false])
```

- `logical_test` : criteria you want to test
- `value_if_true` : value that you want returned if the result is TRUE
- `value_if_false` : value that you want returned if the result is FALSE

IF() function syntax applied

Example:

```
=IF(I2>J2,"Successful Project","Failed Project")
```

	I	J	K
1	usd_pledged	goal	IF
2	1748	75000	=IF(I2>J2,"Successful Project","Failed Project")
3	123817	90000	Successful Project
4	183449	75000	Successful Project
5	1529	50000	Failed Project
6	32	365	Failed Project
7	8576	5000	Successful Project
8	96	50000	Failed Project

IF() function syntax applied

Example:

```
=IF(I2>J2,I2-J2,I2-J2)
```

	I	J	K
1	usd_pledged	goal	IF
2	1748	75000	=IF(I2>J2,I2-J2,I2-J2)
3	123817	90000	33817.49
4	183449	75000	108449.14
5	1529	50000	-48471
6	32	365	-332.5783668
7	8576	5000	3575.53042
8	96	50000	-49904

AND() and OR() functions explained

Syntax:

```
=AND(logical_test1, logical_test2, ...)
```

- `TRUE` if **all** arguments evaluate to `TRUE`
- `FALSE` if **one or more** arguments evaluate to `FALSE`

Syntax:

```
=OR(logical_test1, logical_test2, ...)
```

- `TRUE` if **any** of the arguments evaluate to `TRUE`
- `FALSE` if **all** of the arguments evaluate to `FALSE`

Testing multiple criteria

- Nest `AND()` and `OR()` in the arguments of `IF()`
  - `AND()` : when you need all the criteria to be `TRUE`
  - `OR()` : when you need only one of the criteria to be `TRUE`

Nested IF(), AND(), and OR() functions

Example:

```
=IF(AND(N5="United Kingdom",I5>1000),"YES","NO")
```

	I	J	K	N
1	usd_pledged	goal	Nested IF	country
2	1748	75000	=IF(AND(N2="United Kingdom",I2>1000),"YES","NO")	United States
3	123817	90000	NO	United States
4	183449	75000	NO	United States
5	1529	50000	NO	United States
6	32	365	NO	Canada
7	8576	5000	YES	United Kingdom
8	96	50000	NO	United States
9	726	10000	NO	Hong Kong
10	6473	22500	NO	United States
11	3863	50000	NO	United States

Let's practice!

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Conditional aggregations

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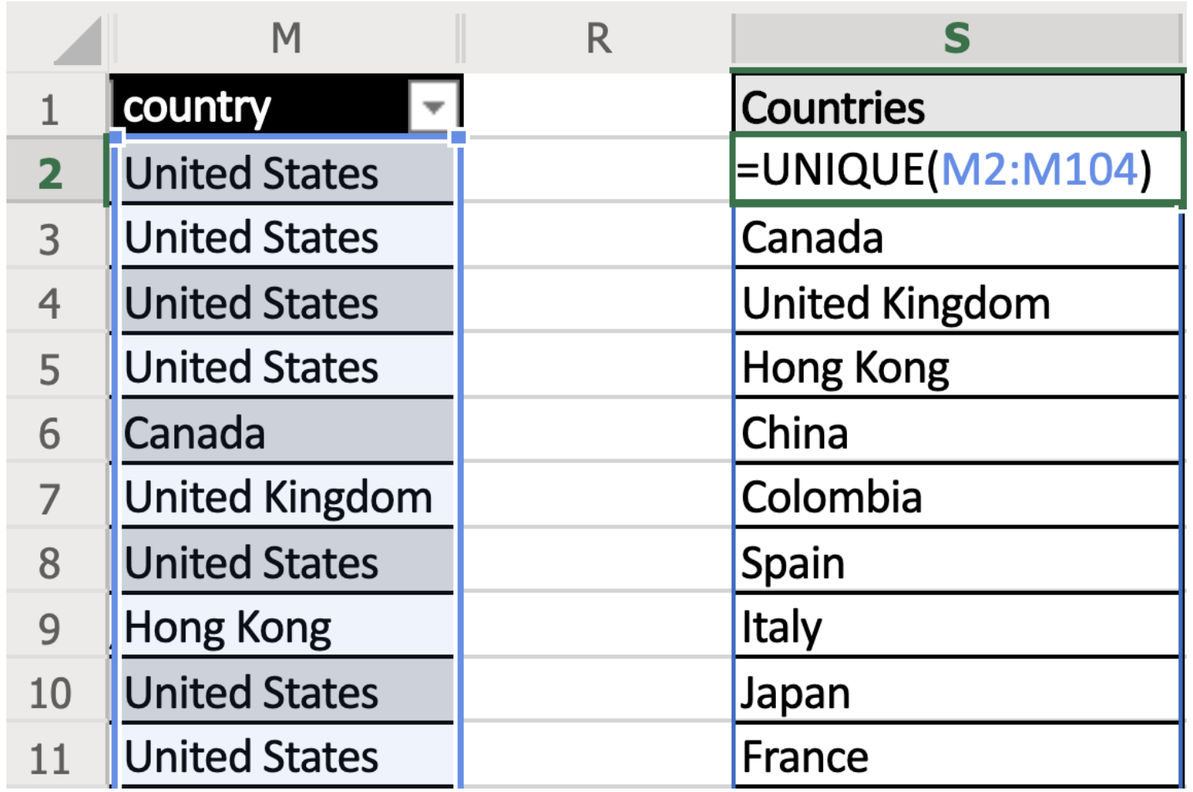
UNIQUE() function

Syntax:

```
=UNIQUE(array)
```

Example:

```
=UNIQUE(M2:M104)
```



	M	R	S
1	country		Countries
2	United States		=UNIQUE(M2:M104)
3	United States		Canada
4	United States		United Kingdom
5	United States		Hong Kong
6	Canada		China
7	United Kingdom		Colombia
8	United States		Spain
9	Hong Kong		Italy
10	United States		Japan
11	United States		France

UNIQUE() and SORT() functions combined

	M	R	S
1	country		Countries
2	United States		=SORT(UNIQUE(M2:M104))
3	United States		Canada
4	United States		China
5	United States		Colombia
6	Canada		Czech Republic
7	United Kingdom		France
8	United States		Germany
9	Hong Kong		Hong Kong
10	United States		Italy
11	United States		Japan

COUNTIF() function

Syntax:

```
=COUNTIF(range, criteria)
```

Example:

```
=COUNTIF(M:M,S2)
```

	M	R	S	T
1	country		Countries	COUNTIF
2	United States		Austria	=COUNTIF(M:M,S2)
3	United States		Canada	9
4	United States		China	1
5	United States		Colombia	1
6	Canada		Czech Republic	1
7	United Kingdom		France	3
8	United States		Germany	3
9	Hong Kong		Hong Kong	3
10	United States		Italy	2
11	United States		Japan	3
12	United States		Mexico	2
13	United States		Netherlands	1
14	United States		Singapore	1

SUMIF() and AVERAGEIF() functions

Syntax:

```
=SUMIF(range, criteria, [sum_range])
```

```
=AVERAGEIF(range, criteria,
[average_range])
```

Example:

```
=SUMIF(M:M,S2,I:I)
```

```
=AVERAGEIF(M:M,S2,I:I)
```

	M	R	S	T	U
1	country		Countries	SUMIF	AVERAGEIF
2	United States		Austria	=SUMIF(M:M,S2,I:I)	52189.0211
3	United States		Canada	28235.9555	3137.328389
4	United States		China	31655	31655
5	United States		Colombia	418	418
6	Canada		Czech Republic	4749	4749
7	United Kingdom		France	125087.3403	41695.78011
8	United States		Germany	27103.03294	9034.344315
9	Hong Kong		Hong Kong	50785.5899	16928.52997
10	United States		Italy	104641.919	52320.9595
11	United States		Japan	350706.4634	116902.1545
12	United States		Mexico	852.232403	426.1162015
13	United States		Netherlands	1389.39671	1389.39671
14	United States		Singapore	90584	90584

AVERAGEIFS() function

Syntax:

```
=AVERAGEIFS(average_range, criteria_range1, criteria1, criteria_range2, criteria2, ...)
```

Example:

```
=AVERAGEIFS(I:I,M:M,S2,P:P,"successful")
```

AVERAGEIFS() function

Syntax:

```
=AVERAGEIFS(average_range, criteria_range1, criteria1, criteria_range2, criteria2)
```

	M	R	S	T
1	country		Countries	AVERAGEIFS
2	United States		Austria	=AVERAGEIFS(I:I,M:M,S2,P:P,"successful")
3	United States		Canada	12219.23787
4	United States		China	31655
5	United States		Colombia	#DIV/0!
6	Canada		Czech Republic	#DIV/0!
7	United Kingdom		France	41695.78011
8	United States		Germany	#DIV/0!
9	Hong Kong		Hong Kong	43547.5899
10	United States		Italy	104641.919
11	United States		Japan	174788
12	United States		Mexico	#DIV/0!
13	United States		Netherlands	#DIV/0!
14	United States		Singapore	90584

Let's practice!

DATA ANALYSIS IN EXCEL

Wrap-up

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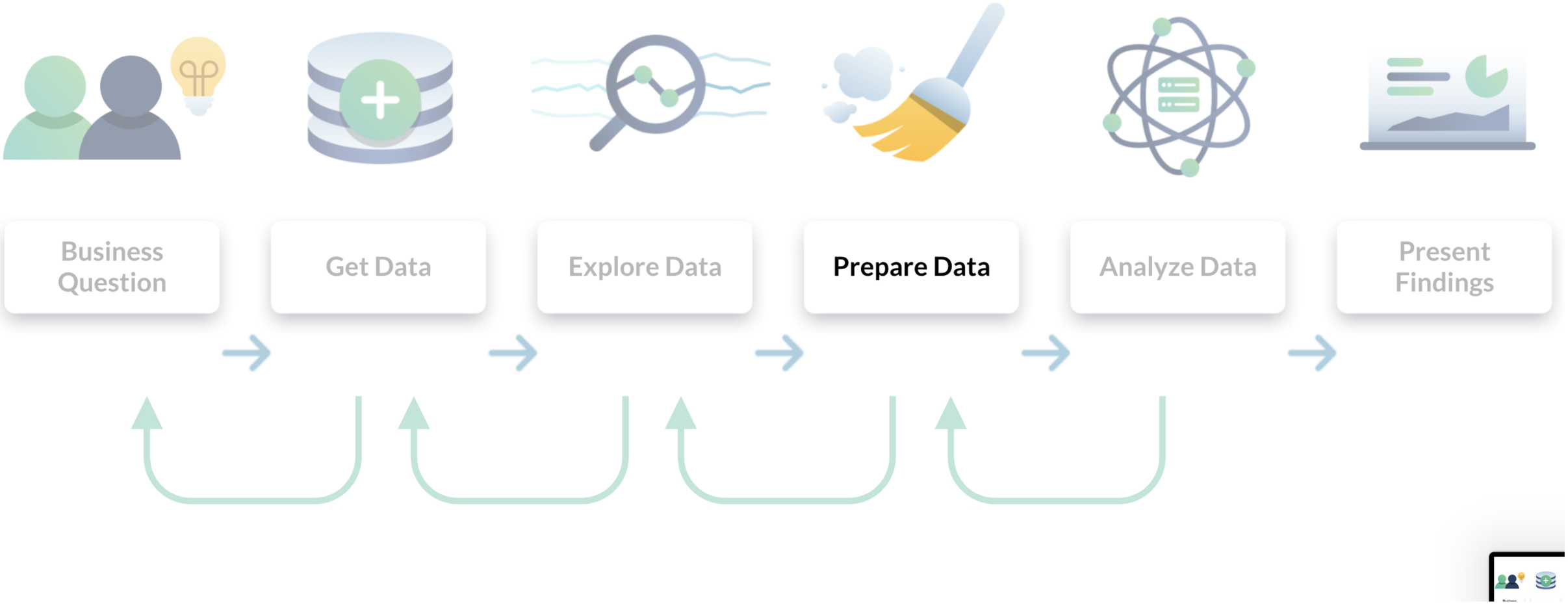
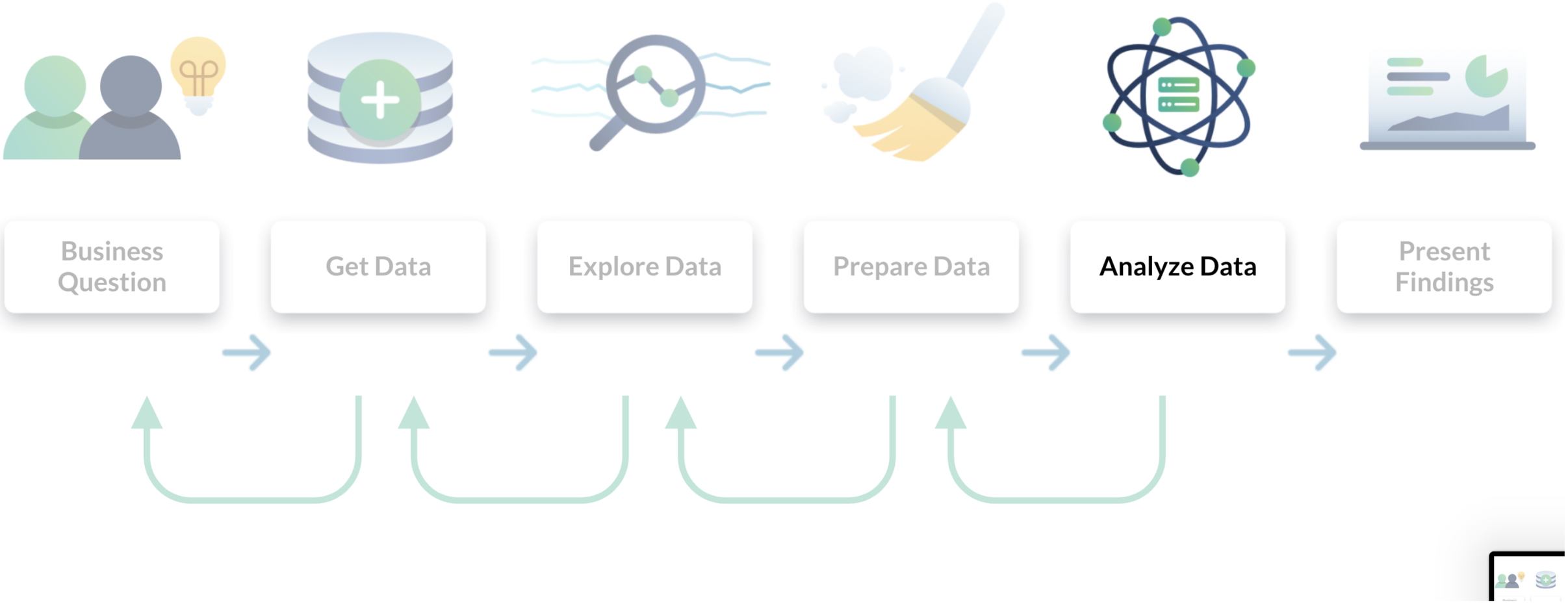
Chapter 1 - Explore

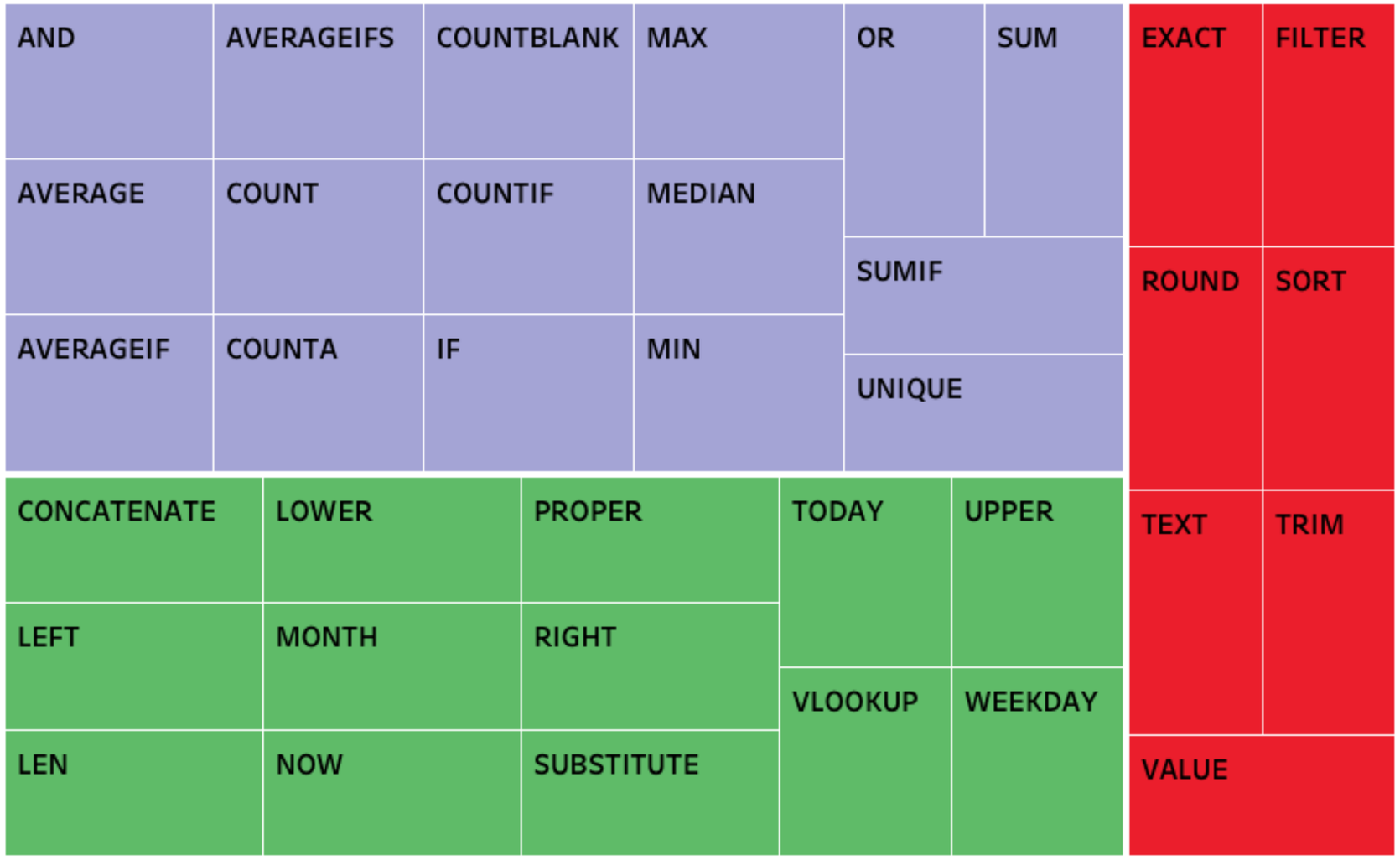
Chapter 2 - Prepare



Chapter 3 - Analyze



Excel function review



Thank you!

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