COMP1022Q
Introduction to Computing with Excel VBA

Handling Cell Formula Errors

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This Presentation

- In this presentation, we look at some common types of cell formula errors:
    1. Invalid reference error   `#REF!`
    2. Invalid value error   `#VALUE!`
    3. Division by zero error   `#DIV/0!`
    4. Not available error   `#N/A`

- We discuss the situation when these errors occur and how to handle them using the following functions:
    - `ISERROR()`
    - `ISNA()`

A Quick Note on The Display of Hashes ('#') in Cells

- You may have seen this already

- A cell shows lots of '#', like the one shown on the right:

Cost per year	6,000
Number of years	40
Total cost	#######

- It looks like an error, but it isn't!

- This is a way Excel uses to say 'I do not have enough space to display the content of the cell'

wider ⟹

- To solve this problem, you can simply make the column wider by clicking and dragging:

Cost per year	6,000
Number of years	40
Total cost	240,000

1) Invalid Reference Error

- An *Invalid Reference Error* occurs when any cell(s) referred to by a formula have been deleted

- For example, the formula shown in cell C2 on the right uses cell A2 and B2:

	A	B	C
1	A	B	A + B
2		5	10	=A2+B2

- If cell B2 is deleted, for example, by deleting the entire column B, the formula will have `#REF!` displayed in the original position of B2, like this:

	A	B
1	A	A + B
2	5	=A2+#REF!

The entire column B has been deleted so the original column C has become the new column B

2) Invalid Value Error

- If a piece of text is used in a formula which expects a number, an *Invalid Value Error* will be shown in the cell as `#VALUE!`

- For example, when using arithmetic operators you need to use numbers as the operands (inputs)
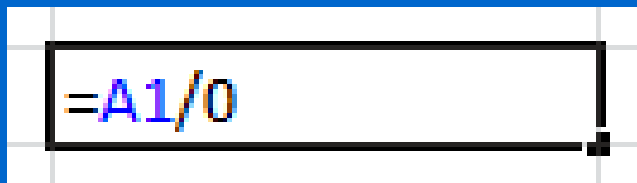
	A	B	C
1	Very	Funny	=A1+B1

The cell A1 and B1 are both text so the formula results in an invalid value error

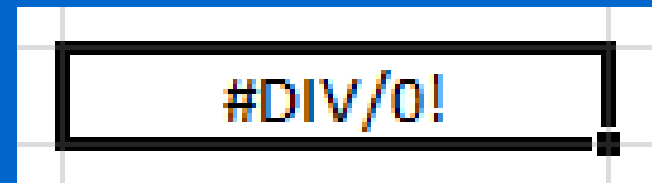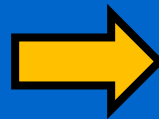|	A	B	C
1	Very	Funny	#VALUE!

3) Division by Zero Error

- If you divide any expression by zero when writing a formula, Excel will show a *Division by Zero Error*

- The error is shown as `#DIV/0!` in the cell containing the formula

- Here is an example:

`=A1/0` ➡ `#DIV/0!`
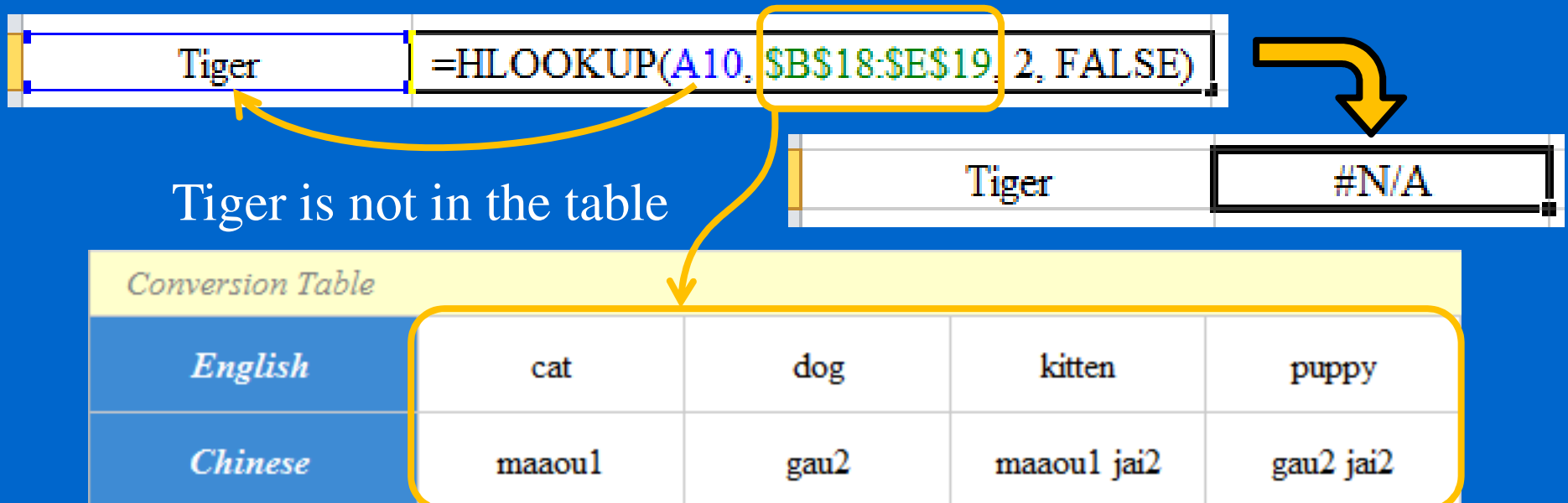
Enter a formula with
a division by zero

A division by zero error
is shown as a result

4) Not Available Error

- When the *Not Available Error* occurs the cell shows #N/A, like this: #N/A

- The error occurs when a cell formula function cannot find the thing it was looking for

- For example, #N/A is returned by lookup functions when the value they are looking for does not exist and approximate matching is not used

| Tiger | =HLOOKUP(A10, $B$18:$E$19, 2, FALSE) |

Tiger is not in the table

| Tiger | #N/A |

Conversion Table				
English	cat	dog	kitten	puppy
Chinese	maaou1	gau2	maaou1 jai2	gau2 jai2

Errors Don't Look Nice

- It does not look good when your cell displays any of the errors

- For example, a weight conversion worksheet has been created using a simple formula, like this:

Please enter your weight in kilograms here:	0
Your weight in pounds is:	=B4 * 2.2

- If you enter a number, it will display the result correctly:

80.00
176.00

- If you enter a piece of text, it will show #VALUE!:

eighty
#VALUE!

- It looks 'scary' and unhelpful

Using ISERROR()

five

Please enter a valid weight.

- We can improve it by using the function `ISERROR()` to detect when an error occurs

- The `ISERROR()` function will return `TRUE` if something generates an error, otherwise it will return `FALSE`

- Here is the improved formula:

```
=IF(ISERROR(B4 * 2.2), "Please enter a valid weight.", B4 * 2.2)
```

Show this message if the formula produces an error

Show the result if the formula does not have an error

Handling the 'Not Available' Error

- `ISERROR()` can handle all types of error

- If you want to detect only the 'not available' error you can use the `ISNA()` function

- The `ISNA()` function is particularly helpful when your worksheet contains lookup functions

- This is because the 'not available' error happens when the lookup functions fail to find the value they are looking for

- The next few slides show an example

Comparing Drink Prices

- An Excel worksheet has been created to show the price comparison of drinks between Starbucks and Pacific Coffee, the two main coffee companies in Hong Kong

- For example, this data would be very useful if you were planning on opening your own coffee shop

	Hot Beverage	Starbucks			Pacific Coffee		
		tall	grande	venti	tall	grande	alto
7	Salted Caramel Mocha	HK$36	HK$39	HK$42	-	-	-
8	Caramel	HK$33	HK$36	HK$39	-	-	-
9	Mocha	HK$33	HK$36	HK$39	HK$33	HK$36	HK$39
10	Latte	HK$30	HK$33	HK$36	HK$30	HK$33	HK$36
11	Cappuccino	HK$30	HK$33	HK$36	HK$30	HK$33	HK$36
12	Americano	HK$26	HK$29	HK$32	HK$26	HK$29	HK$32
13	Espresso	HK$16	HK$19	-	-	-	-
14	Caramel Latte	-	-	-	HK$33	HK$36	HK$39
15	Hazelnut Latte	-	-	-	HK$33	HK$36	HK$39
16	Vanilla Latte	-	-	-	HK$33	HK$36	HK$39
17	Hazelnut Cappuccino	-	-	-	HK$33	HK$36	HK$39
18	Mochaccino	-	-	-	HK$33	HK$36	HK$39
19	Colombian Decaf	-	-	-	HK$23	HK$27	HK$31
20	Hot Chocolate	HK$30	HK$33	HK$36	HK$30	HK$33	HK$36
21	Green Tea Latte	HK$29	HK$32	HK$35	-	-	-
22	English Breakfast Tea Latte	HK$29	HK$32	HK$35	-	-	-
23	Full-Leaf Brewed Tea	HK$20	HK$21	HK$25	-	-	-
24	Steamed Milk	-	-	-	HK$22	HK$26	HK$30
25	English Breakfast	-	-	-	HK$20	HK$23	HK$26
26	Earl Grey	-	-	-	HK$20	HK$23	HK$26

Beverage Prices

- The drink prices are stored in two other separate worksheets for each of Starbucks and Pacific Coffee

	A	B	C	D
1	**Beverage**	**tall**	**grande**	**venti**
2	Salted Caramel Mocha	HK$36	HK$39	HK$42
3	Caramel	HK$33	HK$36	HK$39
4	Mocha	HK$33	HK$36	HK$39
5	Latte	HK$30	HK$33	HK$36
6	Cappuccino	HK$30	HK$33	HK$36
7	Americano	HK$26	HK$29	HK$32
8	Espresso	HK$16	HK$19	-
9	Hot Chocolate	HK$30	HK$33	HK$36
10	Green Tea Latte	HK$29	HK$32	HK$35
11	English Breakfast Tea Latte	HK$29	HK$32	HK$35
12	Full-Leaf Brewed Tea	HK$20	HK$21	HK$25
13				
14				
15				
16				

Coffee Comparison / Starbucks / Pacific Coffee

Ready

	A	B	C	D
1	**Beverage**	**tall**	**grande**	**alto**
2	Latte	HK$30	HK$33	HK$36
3	Cappuccino	HK$30	HK$33	HK$36
4	Mocha	HK$33	HK$36	HK$39
5	Caramel Latte	HK$33	HK$36	HK$39
6	Hazelnut Latte	HK$33	HK$36	HK$39
7	Vanilla Latte	HK$33	HK$36	HK$39
8	Hazelnut Cappuccino	HK$33	HK$36	HK$39
9	Mochaccino	HK$33	HK$36	HK$39
10	Americano	HK$26	HK$29	HK$32
11	Colombian Decaf	HK$23	HK$27	HK$31
12	Hot Chocolate	HK$30	HK$33	HK$36
13	Steamed Milk	HK$22	HK$26	HK$30
14	English Breakfast	HK$20	HK$23	HK$26
15	Earl Grey	HK$20	HK$23	HK$26

Coffee Comparison / Starbucks / Pacific Coffee

Ready

Looking Up the Prices

- The prices of the drinks are then searched in the corresponding company's worksheet using VLOOKUP, like this:

=VLOOKUP($A7,Starbucks!$A$1:$D$12,2,FALSE)

In this example, the formula searches for prices in the 'Starbucks' worksheet   Return the second column   Exact match

- However, if the drink is not found, #N/A will be generated:

		Starbucks			Pacific Coffee		
5							
6		tall	grande	venti	tall	grande	alto
7	Salted Caramel Mocha	HK$36	HK$39	HK$42	#N/A	#N/A	#N/A
8	Caramel	HK$33	HK$36	HK$39	#N/A	#N/A	#N/A
9	Mocha	HK$33	HK$36	HK$39	HK$33	HK$36	HK$39

Using ISNA()

		Starbucks			Pacific Coffee		
		tall	grande	venti	tall	grande	alto
7	Salted Caramel Mocha	HK$36	HK$39	HK$42	-	-	-
8	Caramel	HK$33	HK$36	HK$39	-	-	-
9	Mocha	HK$33	HK$36	HK$39	HK$33	HK$36	HK$39

- To avoid showing #N/A, the formula is changed so that a dash (a hyphen) is shown instead
- We can use ISNA() in a similar way to ISERROR(), like this:

Show a dash if the drink does not exist

```
=IF(ISNA(VLOOKUP($A7,Starbucks!$A$1:$D$12,2,FALSE)), "-",
```

```
VLOOKUP($A7,Starbucks!$A$1:$D$12,2,FALSE))
```

If the drink exists, show the lookup result