COMP1022Q
Introduction to Computing with Excel VBA

More on Cell References

Gibson Lam, Stavros Papadopoulos and David Rossiter

Outcomes

- After completing this presentation, you are expected to be able to:
  1. Write cell references for different ranges of cells such as a single cell, a group of cells, rows of cells, columns of cells and so on
  2. Demonstrate the proper use of absolute and relative references in various situations

Referring to Cells

- An Excel formula may contain a function
- For example, `SUM()`, `MAX()`, and `AVERAGE()`
- Such functions typically perform operations on several different cells i.e. `SUM(A2:B4)`
- In Excel we use the general expression ‘a *range* of cells’ when referring to a group of cells
- Excel provides several ways to refer to ranges of cells, as shown in the following slides

Range References – One Cell

	A	B	C	D	E	F
1	**Referring to a Range of Cells**					
2	*This example shows how you can refer to a range of cells in formulas. The SUM() function is used to demonstrate this by calculating the spending of food*					
3						
4		**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
5	**Breakfast**	HK$18.00	HK$20.00	HK$18.00	HK$17.50	HK$18.00
6	**Lunch**	HK$23.00	HK$30.00	HK$22.00	HK$22.00	HK$21.50
7	**Tea**	HK$17.00	HK$19.00	HK$15.50	HK$20.00	HK$17.50
8	**Dinner**	HK$32.50	HK$43.00	HK$28.00	HK$25.00	HK$36.00
9	**Snack**	HK$12.00	HK$7.00	HK$18.00	HK$6.00	HK$17.00
10						
11	**Your Spending on:**	**Total Spending**	***Description of cell reference***			
12	Monday lunch	HK$23.00	*One cell*			
13	Monday after lunch	HK$61.50	*Part of a column*			
14	Dinner of Tue, Wed and Thur	HK$96.00	*Part of a row*			
15	Entire week	HK$523.50	*Matrix of cells*			
16	Food on or over HK$30	HK$141.50	*Set of unrelated cells*			
17	Wednesday	HK$101.50	*Entire column*			
18	Dinner only	HK$164.50	*Entire row*			
19	Thursday and Friday	HK$200.50	*Multiple columns*			
20	Lunch, tea and dinner	HK$372.00	*Multiple rows*			

`=SUM(B6)`

Range References – Part of a Column

	A	B	C	D	E	F
1	**Referring to a Range of Cells**					
	This example shows how you can refer to a range of cells in formulas.					
2	*The SUM() function is used to demonstrate this by calculating the spending of food*					
3						
4		**Monday**	**Tuesday**	**Wednesda**	**Thursday**	**Friday**
5	**Breakfast**	HK$18.00	HK$20.00	HK$18.00	HK$17.50	HK$18.00
6	**Lunch**	HK$23.00	HK$30.00	HK$22.00	HK$22.00	HK$21.50
7	**Tea**	HK$17.00	HK$19.00	HK$15.50	HK$20.00	HK$17.50
8	**Dinner**	HK$32.50	HK$43.00	HK$28.00	HK$25.00	HK$36.00
9	**Snack**	HK$12.00	HK$7.00	HK$18.00	HK$6.00	HK$17.00
10						
11	**Your Spending on:**	**Total Spending**	***Description of cell reference***			
12	Monday lunch	HK$23.00	*One cell*			
13	Monday after lunch	HK$61.50	*Part of a column*			
14	Dinner of Tue, Wed and Thur	HK$96.00	*Part of a row*			
15	Entire week	HK$523.50	*Matrix of cells*			
16	Food on or over HK$30	HK$141.50	*Set of unrelated cells*			
17	Wednesday	HK$101.50	*Entire column*			
18	Dinner only	HK$164.50	*Entire row*			
19	Thursday and Friday	HK$200.50	*Multiple columns*			
20	Lunch, tea and dinner	HK$372.00	*Multiple rows*			

`=SUM(B7:B9)`

Range References – Part of a Row

	A	B	C	D	E	F
1	**Referring to a Range of Cells**					
2	*This example shows how you can refer to a range of cells in formulas. The SUM() function is used to demonstrate this by calculating the spending of food*					
3						
4		**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
5	**Breakfast**	HK$18.00	HK$20.00	HK$18.00	HK$17.50	HK$18.00
6	**Lunch**	HK$23.00	HK$30.00	HK$22.00	HK$22.00	HK$21.50
7	**Tea**	HK$17.00	HK$19.00	HK$15.50	HK$20.00	HK$17.50
8	**Dinner**	HK$32.50	HK$43.00	HK$28.00	HK$25.00	HK$36.00
9	**Snack**	HK$12.00	HK$7.00	HK$18.00	HK$6.00	HK$17.00
10						
11	**Your Spending on:**	**Total Spending**	***Description of cell reference***			
12	Monday lunch	HK$23.00	*One cell*			
13	Monday after lunch	HK$61.50	*Part of a column*			
14	Dinner of Tue, Wed and Thur	HK$96.00	*Part of a row*			
15	Entire week	HK$523.50	*Matrix of cells*			
16	Food on or over HK$30	HK$141.50	*Set of unrelated cells*			
17	Wednesday	HK$101.50	*Entire column*			
18	Dinner only	HK$164.50	*Entire row*			
19	Thursday and Friday	HK$200.50	*Multiple columns*			
20	Lunch, tea and dinner	HK$372.00	*Multiple rows*			

`=SUM(C8:E8)`

Range References – Matrix of Cells

	A	B	C	D	E	F
1	**Referring to a Range of Cells**					
	This example shows how you can refer to a range of cells in formulas.					
2	*The SUM() function is used to demonstrate this by calculating the spending of food*					
3						
4		**Monday**	**Tuesday**	**Wednesda**	**Thursday**	**Friday**
5	**Breakfast**	HK$18.00	HK$20.00	HK$18.00	HK$17.50	HK$18.00
6	**Lunch**	HK$23.00	HK$30.00	HK$22.00	HK$22.00	HK$21.50
7	**Tea**	HK$17.00	HK$19.00	HK$15.50	HK$20.00	HK$17.50
8	**Dinner**	HK$32.50	HK$43.00	HK$28.00	HK$25.00	HK$36.00
9	**Snack**	HK$12.00	HK$7.00	HK$18.00	HK$6.00	HK$17.00
10						
11	**Your Spending on:**	**Total Spending**	***Description of cell reference***			
12	Monday lunch	HK$23.00	*One cell*			
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15	Entire week	HK$523.50	*Matrix of cells*			
16	Food on or over HK$30	HK$141.50	*Set of unrelated cells*			
17	Wednesday	HK$101.50	*Entire column*			
18	Dinner only	HK$164.50	*Entire row*			
19	Thursday and Friday	HK$200.50	*Multiple columns*			
20	Lunch, tea and dinner	HK$372.00	*Multiple rows*			

Range References – Set of Unrelated Cells

	A	B	C	D	E	F
1	**Referring to a Range of Cells**					
2	*This example shows how you can refer to a range of cells in formulas. The SUM() function is used to demonstrate this by calculating the spending of food*					
3						
4		**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
5	**Breakfast**	HK$18.00	HK$20.00	HK$18.00	HK$17.50	HK$18.00
6	**Lunch**	HK$23.00	HK$30.00	HK$22.00	HK$22.00	HK$21.50
7	**Tea**	HK$17.00	HK$19.00	HK$15.50	HK$20.00	HK$17.50
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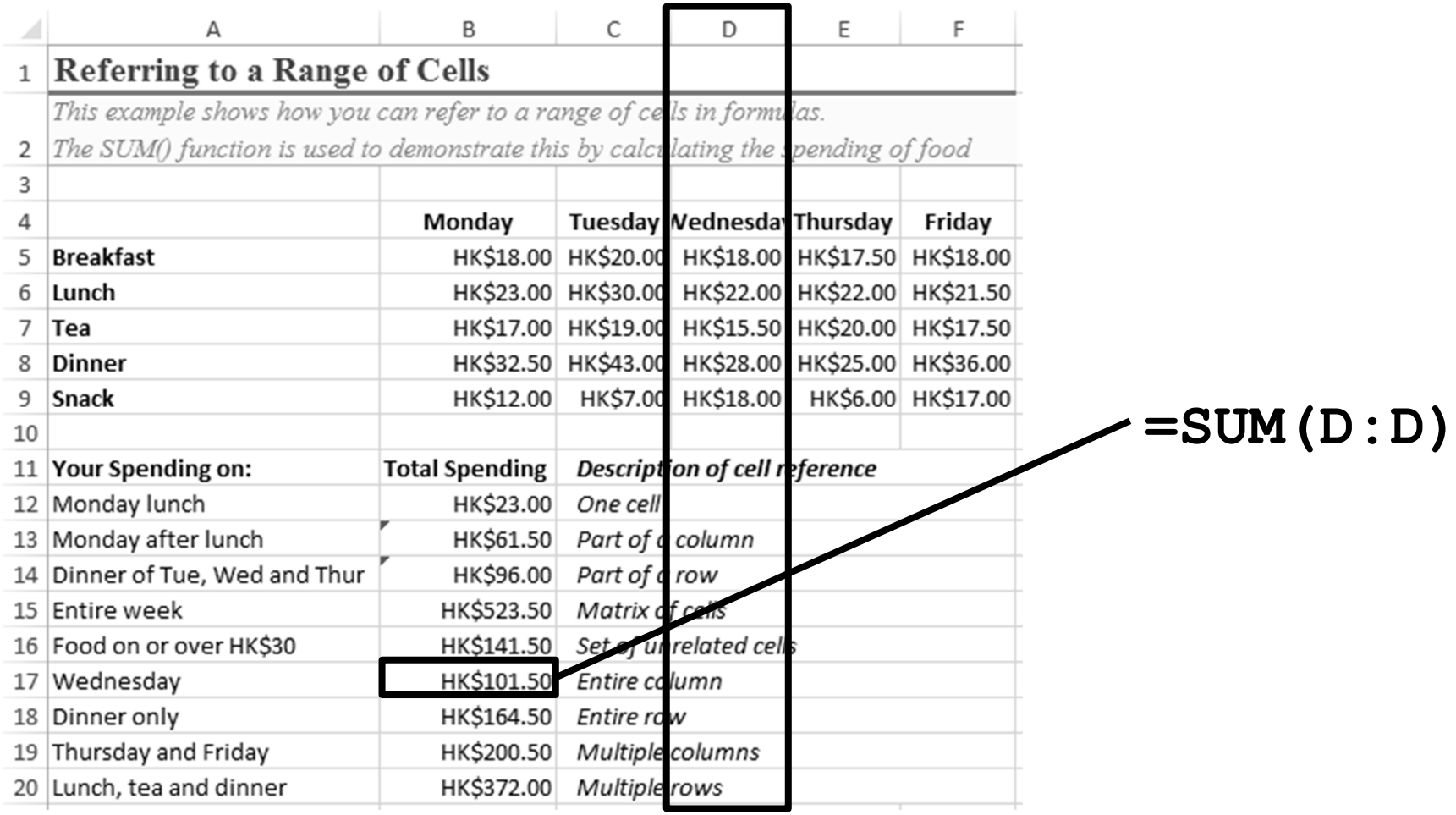
9	**Snack**	HK$12.00	HK$7.00	HK$18.00	HK$6.00	HK$17.00
10						
11	**Your Spending on:**	**Total Spending**	***Description of cell reference***			
12	Monday lunch	HK$23.00	*One cell*			
13	Monday after lunch	HK$61.50	*Part of a column*			
14	Dinner of Tue, Wed and Thur	HK$96.00	*Part of a row*			
15	Entire week	HK$523.50	*Matrix of cells*			
16	Food on or over HK$30	HK$141.50	*Set of unrelated cells*			
17	Wednesday	HK$101.50	*Entire column*			
18	Dinner only	HK$164.50	*Entire row*			
19	Thursday and Friday	HK$200.50	*Multiple columns*			
20	Lunch, tea and dinner	HK$372.00	*Multiple rows*			

```
=SUM(B8,C6,C8,F8)
```

Range References – Entire Column



	A	B	C	D	E	F
1	**Referring to a Range of Cells**					
	This example shows how you can refer to a range of cells in formulas.					
2	*The SUM() function is used to demonstrate this by calculating the spending of food*					
3						
4		**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
5	**Breakfast**	HK$18.00	HK$20.00	HK$18.00	HK$17.50	HK$18.00
6	**Lunch**	HK$23.00	HK$30.00	HK$22.00	HK$22.00	HK$21.50
7	**Tea**	HK$17.00	HK$19.00	HK$15.50	HK$20.00	HK$17.50
8	**Dinner**	HK$32.50	HK$43.00	HK$28.00	HK$25.00	HK$36.00
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10						
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18	Dinner only	HK$164.50	*Entire row*			
19	Thursday and Friday	HK$200.50	*Multiple columns*			
20	Lunch, tea and dinner	HK$372.00	*Multiple rows*			

Range References – Entire Row

	A	B	C	D	E	F
1	**Referring to a Range of Cells**					
	This example shows how you can refer to a range of cells in formulas.					
2	*The SUM() function is used to demonstrate this by calculating the spending of food*					
3						
4		**Monday**	**Tuesday**	**Wednesda**	**Thursday**	**Friday**
5	**Breakfast**	HK$18.00	HK$20.00	HK$18.00	HK$17.50	HK$18.00
6	**Lunch**	HK$23.00	HK$30.00	HK$22.00	HK$22.00	HK$21.50
7	**Tea**	HK$17.00	HK$19.00	HK$15.50	HK$20.00	HK$17.50
8	**Dinner**	HK$32.50	HK$43.00	HK$28.00	HK$25.00	HK$36.00
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17	Wednesday	HK$101.50	*Entire column*			
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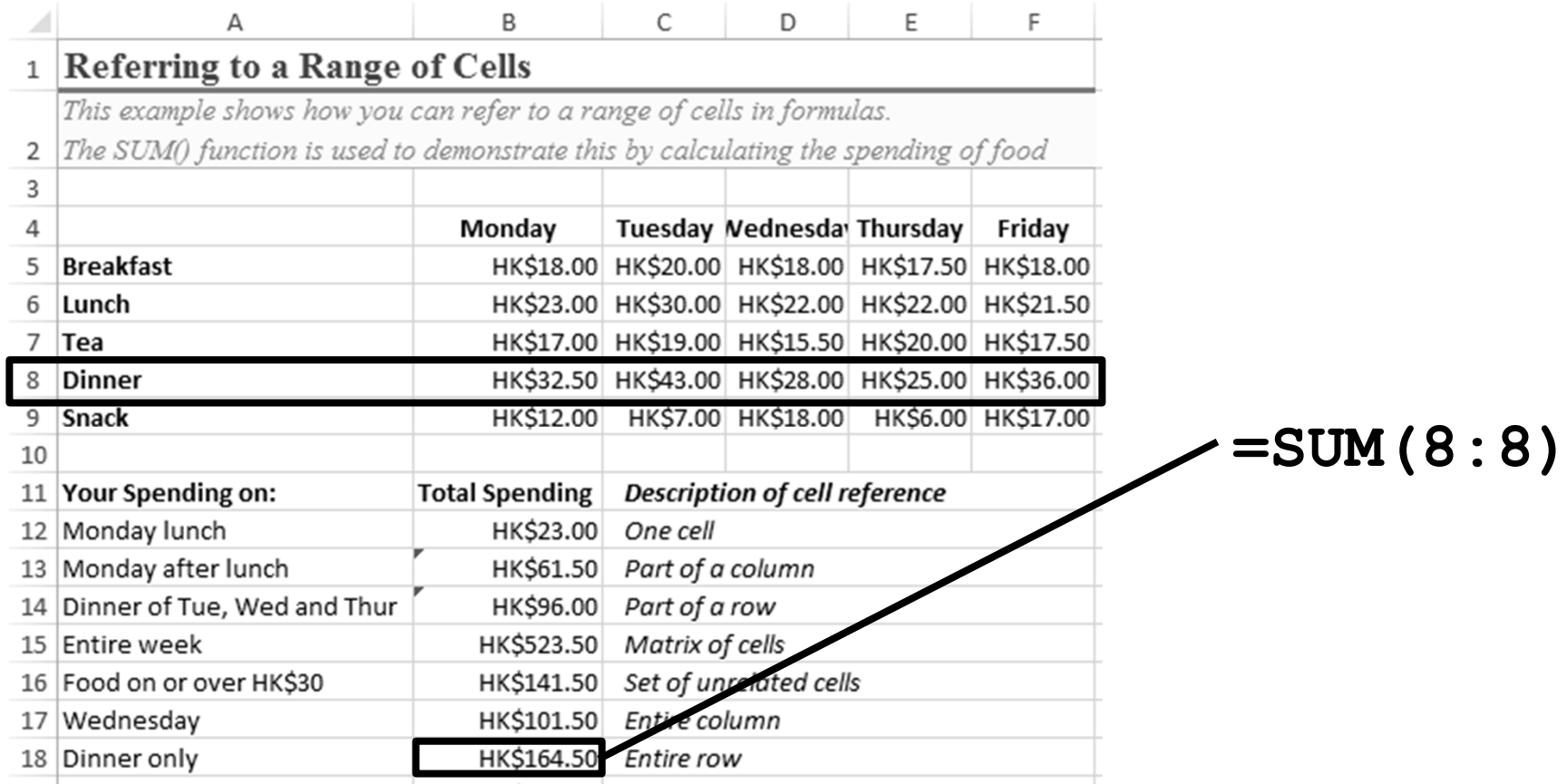


Range References – Multiple Columns

	A	B	C	D	E	F
1	**Referring to a Range of Cells**					
	This example shows how you can refer to a range of cells in formulas.					
2	*The SUM() function is used to demonstrate this by calculating the spending of food*					
3						
4		**Monday**	**Tuesday**	**Wednesda**	**Thursday**	**Friday**
5	**Breakfast**	HK$18.00	HK$20.00	HK$18.00	HK$17.50	HK$18.00
6	**Lunch**	HK$23.00	HK$30.00	HK$22.00	HK$22.00	HK$21.50
7	**Tea**	HK$17.00	HK$19.00	HK$15.50	HK$20.00	HK$17.50
8	**Dinner**	HK$32.50	HK$43.00	HK$28.00	HK$25.00	HK$36.00
9	**Snack**	HK$12.00	HK$7.00	HK$18.00	HK$6.00	HK$17.00
10						
11	**Your Spending on:**	**Total Spending**	***Description of cell reference***			
12	Monday lunch	HK$23.00	*One cell*			
13	Monday after lunch	HK$61.50	*Part of a column*			
14	Dinner of Tue, Wed and Thur	HK$96.00	*Part of a row*			
15	Entire week	HK$523.50	*Matrix of cells*			
16	Food on or over HK$30	HK$141.50	*Set of unrelated cells*			
17	Wednesday	HK$101.50	*Entire column*			
18	Dinner only	HK$164.50	*Entire row*			
19	Thursday and Friday	HK$200.50	*Multiple columns*			
20	Lunch, tea and dinner	HK$372.00	*Multiple rows*			

`=SUM(E:F)`

Range References – Multiple Rows

	A	B	C	D	E	F
1	**Referring to a Range of Cells**					
	This example shows how you can refer to a range of cells in formulas.					
2	*The SUM() function is used to demonstrate this by calculating the spending of food*					
3						
4		**Monday**	**Tuesday**	**Wednesda**	**Thursday**	**Friday**
5	**Breakfast**	HK$18.00	HK$20.00	HK$18.00	HK$17.50	HK$18.00
6	**Lunch**	HK$23.00	HK$30.00	HK$22.00	HK$22.00	HK$21.50
7	**Tea**	HK$17.00	HK$19.00	HK$15.50	HK$20.00	HK$17.50
8	**Dinner**	HK$32.50	HK$43.00	HK$28.00	HK$25.00	HK$36.00
9	**Snack**	HK$12.00	HK$7.00	HK$18.00	HK$6.00	HK$17.00
10						
11	**Your Spending on:**	**Total Spending**	***Description of cell reference***			
12	Monday lunch	HK$23.00	*One cell*			
13	Monday after lunch	HK$61.50	*Part of a column*			
14	Dinner of Tue, Wed and Thur	HK$96.00	*Part of a row*			
15	Entire week	HK$523.50	*Matrix of cells*			
16	Food on or over HK$30	HK$141.50	*Set of unrelated cells*			
17	Wednesday	HK$101.50	*Entire column*			
18	Dinner only	HK$164.50	*Entire row*			
19	Thursday and Friday	HK$200.50	*Multiple columns*			
20	Lunch, tea and dinner	HK$372.00	*Multiple rows*			

`=SUM(6:8)`

Advanced Example of Using Absolute/Relative Cell Referencing

- In this example we want to know the best country to get profit by buying and then selling lots of iPhone 6
- We create a worksheet containing the cost to buy one iPhone 6 in different countries with different quantities:

4	Cost of 16Gb iPhone 6, in HK$ (Feb 2015)	Cost per iPhone, if buying this many in that country:				
5	Country	1	5	10	50	100
6	Australia	HK$5,268	HK$5,005	HK$4,754	HK$4,517	HK$4,291
7	Canada	HK$4,666	HK$4,433	HK$4,211	HK$4,001	HK$3,800
8	Denmark	HK$4,889	HK$4,645	HK$4,412	HK$4,192	HK$3,982
9	Japan	HK$5,007	HK$4,757	HK$4,519	HK$4,293	HK$4,078
10	New Zealand	HK$5,737	HK$5,450	HK$5,178	HK$4,919	HK$4,673
11	UK	HK$6,404	HK$6,084	HK$5,780	HK$5,491	HK$5,216
12	USA	HK$5,031	HK$4,779	HK$4,540	HK$4,313	HK$4,098

Writing a Correct Formula

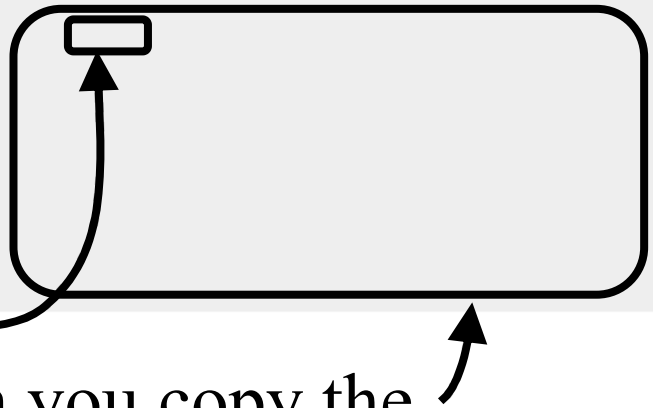
- Then we calculate the profit in another area of the worksheet

	A	B	C	D	E	F	G	H	I	J
1	**Example of a Formula that uses Absolute and Relative Cell References**									
2	*This example shows the use of a formula which uses both relative and absolute cell references. First, the formula in cell G6 was carefully written. Then the cell was copied and pasted into the area G6 to J12. Because the formula was carefully designed it could be pasted into the target cells without change.*									
3										
4	**Cost of 16Gb iPhone 6, in HK$ (Feb 2015)**	**Cost per iPhone, if buying this many in that country:**					**Total profit, if buying and then individually selling this many iPhones in that country:**			
5	**Country**	**1**	**5**	**10**	**50**	**100**	**5**	**10**	**50**	**100**
6	**Australia**	HK$5,268	HK$5,005	HK$4,754	HK$4,517	HK$4,291				
7	**Canada**	HK$4,666	HK$4,433	HK$4,211	HK$4,001	HK$3,800				
8	**Denmark**	HK$4,889	HK$4,645	HK$4,412	HK$4,192	HK$3,982				
9	**Japan**	HK$5,007	HK$4,757	HK$4,519	HK$4,293	HK$4,078				
10	**New Zealand**	HK$5,737	HK$5,450	HK$5,178	HK$4,919	HK$4,673				
11	**UK**	HK$6,404	HK$6,084	HK$5,780	HK$5,491	HK$5,216				
12	**USA**	HK$5,031	HK$4,779	HK$4,540	HK$4,313	HK$4,098				

- The profit for various situations will be shown here - so we want to design an Excel formula which can be copied to this entire area

Make One Formula, Copy and Paste it into an Area

	A	B	C	D	E	F	G	H	I	J
1	**Example of a Formula that uses Absolute and Relative Cell References**									
2	*This example shows the use of a formula which uses both relative and absolute cell references. First, the formula in cell G6 was carefully written. Then the cell was copied and pasted into the area G6 to J12. Because the formula was carefully designed it could be pasted into the target cells without change.*									
3										
4	**Cost of 16Gb iPhone 6, in HK$ (Feb 2015)**	**Cost per iPhone, if buying this many in that country:**					**Total profit, if buying and then individually selling this many iPhones in that country:**			
5	**Country**	**1**	**5**	**10**	**50**	**100**	**5**	**10**	**50**	**100**
6	**Australia**	HK$5,268	HK$5,005	HK$4,754	HK$4,517	HK$4,291				
7	**Canada**	HK$4,666	HK$4,433	HK$4,211	HK$4,001	HK$3,800				
8	**Denmark**	HK$4,889	HK$4,645	HK$4,412	HK$4,192	HK$3,982				
9	**Japan**	HK$5,007	HK$4,757	HK$4,519	HK$4,293	HK$4,078				
10	**New Zealand**	HK$5,737	HK$5,450	HK$5,178	HK$4,919	HK$4,673				
11	**UK**	HK$6,404	HK$6,084	HK$5,780	HK$5,491	HK$5,216				
12	**USA**	HK$5,031	HK$4,779	HK$4,540	HK$4,313	HK$4,098				



- The usual approach is to first carefully write the formula for the top-left cell
- Then you copy the top-left cell, select the whole area, and paste

Thinking About the Formula

- Each cell in that area needs to show the profit
- Profit is the difference between the income and the cost
- For example, you purchase 5 iPhones in Australia
- Here is an illustration of the cost:

4	Cost of 16Gb iPhone 6, in HK$ (Feb 2015)	Cost per iPhone, if buying this many in that country:					Total profit, if buying and then individually selling this many iPhones in that country:			
5	Country	1	5	10	50	100	5	10	50	100
6	Australia	HK$5,268	HK$5,005	HK$4,754	HK$4,517	HK$4,291				
7	Canada	HK$4,666	HK$4,433	HK$4,211	HK$4,001	HK$3,800				

cost = cost per iPhone * number purchased

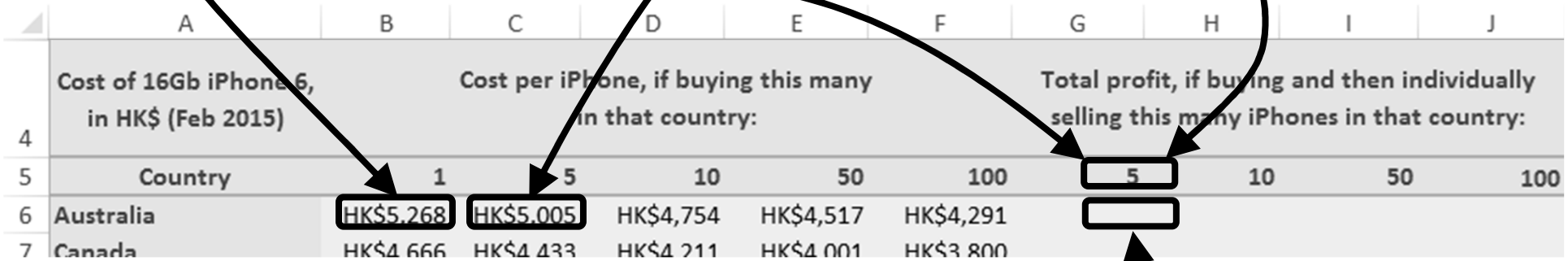
- Here is an illustration of the income:

4	Cost of 16Gb iPhone 6, in HK$ (Feb 2015)	Cost per iPhone, if buying this many in that country:					Total profit, if buying and then individually selling this many iPhones in that country:			
5	Country	1	5	10	50	100	5	10	50	100
6	Australia	HK$5,268	HK$5,005	HK$4,754	HK$4,517	HK$4,291				
7	Canada	HK$4,666	HK$4,433	HK$4,211	HK$4,001	HK$3,800				

income = cost per iPhone * number sold

income = sale price per iPhone * number sold

cost = cost per iPhone * number purchased



	A	B	C	D	E	F	G	H	I	J
4	Cost of 16Gb iPhone 6, in HK$ (Feb 2015)	Cost per iPhone, if buying this many in that country:					Total profit, if buying and then individually selling this many iPhones in that country:			
5	Country	1	5	10	50	100	5	10	50	100
6	Australia	HK$5,268	HK$5,005	HK$4,754	HK$4,517	HK$4,291				
7	Canada	HK$4,666	HK$4,433	HK$4,211	HK$4,001	HK$3,800				

- For this 'profit' cell, you might enter a formula of `=(B6*G5)-(C6*G5)`
  income *cost*
- The formula is correct for that cell – but if you copy it and paste it into the area, you will get nonsense results:

4	Cost of 16Gb iPhone 6, in HK$ (Feb 2015)	Cost per iPhone, if buying this many in that country:					Total profit, if buying and then individually selling this many iPhones in that country:			
5	Country	1	5	10	50	100	5	10	50	100
6	Australia	HK$5,268	HK$5,005	HK$4,754	HK$4,517	HK$4,291	HK$1,317	HK$2,502	HK$11,886	HK$22,583
7	Canada	HK$4,666	HK$4,433	HK$4,211	HK$4,001	HK$3,800	HK$307,256	HK$554,597	HK$2,502,620	HK$4,517,229
8	Denmark	HK$4,889	HK$4,645	HK$4,412	HK$4,192	HK$3,982	HK$75,108,754	HK$128,792,735	HK$552,118,357	HK$946,744,953
9	Japan	HK$5,007	HK$4,757	HK$4,519	HK$4,293	HK$4,078	HK$18,803,476,475	HK$30,631,098,221	HK$124,746,104,728	HK$203,212,963,928
10	New Zealand	HK$5,737	HK$5,450	HK$5,178	HK$4,919	HK$4,673	HK$5,393,777,226,861	HK$8,347,203,998,534	HK$32,294,536,677,445	HK$49,977,793,732,803
11	UK	HK$6,404	HK$6,084	HK$5,780	HK$5,491	HK$5,216	HK$1,727,087,468,040,940	HK$2,539,135,984,313,930	HK$9,332,491,356,316,510	HK$13,720,477,430,712,300
12	USA	HK$5,031	HK$4,779	HK$4,540	HK$4,313	HK$4,098	HK$434,448,852,585,698,000	HK$606,783,674,011,460,000	HK$2,118,698,351,114,980,000	HK$2,959,132,155,511,820,000

Designing The Formula

	A	B	C	D	E	F	G	H	I	J
4	Cost of 16Gb iPhone 6, in HK$ (Feb 2015)	Cost per iPhone, if buying this many in that country:					Total profit, if buying and then individually selling this many iPhones in that country:			
5	Country	1	5	10	50	100	5	10	50	100
6	Australia	HK$5,268	HK$5,005	HK$4,754	HK$4,517	HK$4,291				
7	Canada	HK$4,666	HK$4,433	HK$4,211	HK$4,001	HK$3,800				

- Think about the formula carefully: `=(B6*G5)-(C6*G5)`
- When we copy and paste the formula, we want this column to be fixed, but not the row
  - Here we want the row to be fixed, but not the column
- Here we want the row to be fixed, but not the column
- Here we don't need to fix either the row or the column

- So the formula must be: `=($B6*G$5)-(C6*G$5)`

- We enter that formula into the top-left cell, copy it, and paste it into the area:

4	Cost of 16Gb iPhone 6, in HK$ (Feb 2015)	Cost per iPhone, if buying this many in that country:					Total profit, if buying and then individually selling this many iPhones in that country:			
5	Country	1	5	10	50	100	5	10	50	100
6	Australia	HK$5,268	HK$5,005	HK$4,754	HK$4,517	HK$4,291	HK$1,317	HK$5,136	HK$37,567	HK$97,718
7	Canada	HK$4,666	HK$4,433	HK$4,211	HK$4,001	HK$3,800	HK$1,167	HK$4,549	HK$33,274	HK$86,551
8	Denmark	HK$4,889	HK$4,645	HK$4,412	HK$4,192	HK$3,982	HK$1,222	HK$4,767	HK$34,865	HK$90,688
9	Japan	HK$5,007	HK$4,757	HK$4,519	HK$4,293	HK$4,078	HK$1,252	HK$4,882	HK$35,706	HK$92,877
10	New Zealand	HK$5,737	HK$5,450	HK$5,178	HK$4,919	HK$4,673	HK$1,434	HK$5,594	HK$40,912	HK$106,418
11	UK	HK$6,404	HK$6,084	HK$5,780	HK$5,491	HK$5,216	HK$1,601	HK$6,244	HK$45,669	HK$118,790
12	USA	HK$5,031	HK$4,779	HK$4,540	HK$4,313	HK$4,098	HK$1,258	HK$4,905	HK$35,877	HK$93,322

- You can use *Ctrl* `
to check that the formulas are correct:

Total profit, if buying and then individually selling this many iPhones in that country:			
5	10	50	100
=($B6*G$5)-(C6*G$5)	=($B6*H$5)-(D6*H$5)	=($B6*I$5)-(E6*I$5)	=($B6*J$5)-(F6*J$5)
=($B7*G$5)-(C7*G$5)	=($B7*H$5)-(D7*H$5)	=($B7*I$5)-(E7*I$5)	=($B7*J$5)-(F7*J$5)
=($B8*G$5)-(C8*G$5)	=($B8*H$5)-(D8*H$5)	=($B8*I$5)-(E8*I$5)	=($B8*J$5)-(F8*J$5)
=($B9*G$5)-(C9*G$5)	=($B9*H$5)-(D9*H$5)	=($B9*I$5)-(E9*I$5)	=($B9*J$5)-(F9*J$5)
=($B10*G$5)-(C10*G$5	=($B10*H$5)-(D10*H$5)	=($B10*I$5)-(E10*I$5)	=($B10*J$5)-(F10*J$5)
=($B11*G$5)-(C11*G$5	=($B11*H$5)-(D11*H$5)	=($B11*I$5)-(E11*I$5)	=($B11*J$5)-(F11*J$5)
=($B12*G$5)-(C12*G$5	=($B12*H$5)-(D12*H$5)	=($B12*I$5)-(E12*I$5)	=($B12*J$5)-(F12*J$5)