



# CPSC203 – Introduction to Problem Solving and Using Application Software

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# Introduction

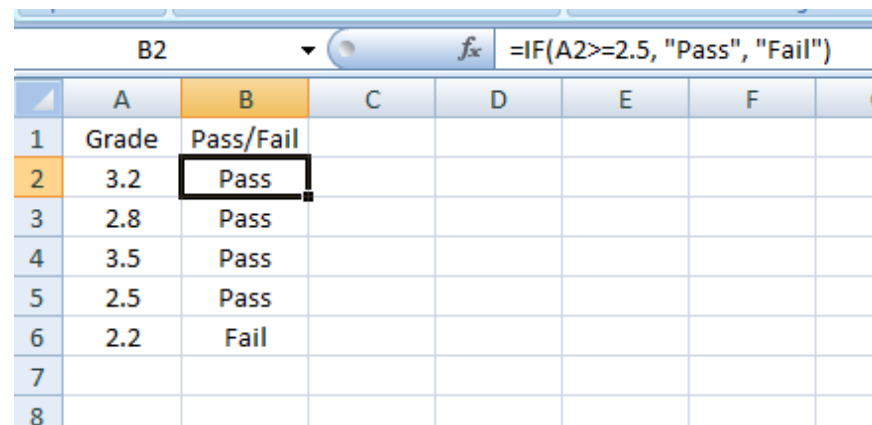
- If-Then Statement
- Pivot Table
- Lookup Function

# If-Then Statement

- An If-Then statement consists of three parts: logical test, true statement, and false statement.
- Syntax :  
=IF(<logical statement>, <true statement>, <false statement>)
- Example:  
=IF(A2 > 2, "Pass", "Fail")

# Example (1)

- If **Grade** is greater than or equal to 2.5 then it's a **Pass**, otherwise it's a **Fail**.



The screenshot shows a spreadsheet with the following data:

	A	B	C	D	E	F	G
1	Grade	Pass/Fail					
2	3.2	Pass					
3	2.8	Pass					
4	3.5	Pass					
5	2.5	Pass					
6	2.2	Fail					
7							
8							

# Example (2)

- If **Grade** is greater than **Threshold** then it's a **Pass**, otherwise it's a **Fail**.

	A	B	C	D	E	F
1	Grade	Pass/Fail				
2	3.2	Pass				
3	2.8	Fail				
4	3.5	Pass				
5	2.5	Fail				
6	2.2	Fail				
7						
8						
9	Threshold	3				
10						
11						

# Example (3)

- If item is on sale then you get 10% off, otherwise item is sold regular price.

	A	B	C	D	E	F
1	Item Price	On Sale	Sale Price			
2	3.25	No	3.25			
3	8.99	No	8.99			
4	4.10	Yes	3.69			
5	5.20	Yes	4.68			
6						
7						

# Nested If-Then Statement

- A nested If-Then statement can be created, if the true statement and/or false statement consists of another If-Then statement.
- Example  
=IF(B2="Cat", "Kitten", IF(B2="Dog", "Puppy", "Other"))

# Example

- Calgary transit charges adults and youth \$2.75 and \$1.75 respectively. Children's fare is free.

	A	B	C	D	E	F	G	H
1	Name	Age Group	Fare					
2	Mike	Adult	2.75					
3	Rose	Child	0					
4	Beth	Child	0					
5	Adam	Youth	1.75					
6	Susan	Adult	2.75					
7								



# Exercise

- Write a nested If-Then statement that converts point grade data into equivalent letter grade data.

Grade Point	Letter Grade
Above 3.5	A
Between 3.0 and 3.5	B
Between 2.5 and 3.0	C
Between 2.0 and 2.5	D
Below 2.0	F

# Pivot Table

- Pivot tables provide a mechanism to summarize data, and as a result, makes it easier to analyze and present data.
- Creating a pivot table:
  - Step 1: select a range of cells.
  - Step 2: select the 'PivotTable' icon.
  - Step 3: specify the destination of the Pivot table.
  - Step 4: format the Pivot table.

# Example (1)

Answer the following questions for a huge data set (a small portion of which you can see here):

- The total admissions in 2009.
- The average of admission in Fall 2008.
- The minimum of admissions in Winter.
- ...

<b>Department</b>	<b>Year</b>	<b>Semester</b>	<b>Admissions</b>
Business	2008	Winter	145
Business	2008	Spring	84
Business	2008	Fall	132
Business	2009	Winter	186
kinesiology	2008	Winter	133
kinesiology	2008	Spring	110
kinesiology	2008	Fall	105
kinesiology	2009	Winter	65
kinesiology	2009	Spring	73
Physics	2008	Winter	35
Physics	2008	Spring	45
Physics	2008	Fall	120
Physics	2009	Winter	55
Physics	2009	Spring	77
Physics	2009	Fall	90
Fine Arts	2008	Winter	109
Fine Arts	2008	Fall	98
Fine Arts	2009	Winter	124
Fine Arts	2009	Fall	86

## Example (2)

- Total admissions

3	Sum of Admissions	Year		
4	Department	2008	2009	Grand Total
5	Business	2008 (Year)	186	547
6	Fine Arts	Column: 2008	210	417
7	kinesiology	348	138	486
8	Physics	200	222	422
9	Grand Total	1116	756	1872
10				

- Average of admissions

3	Average of Admissions	Year	Semester						
4		2008		2008 Total	2009			2009 Total	Grand Total
5	Department	Fall	Spring	Winter		Fall	Spring	Winter	
6	Business	132	84	145	120.3333333			186	186
7	Fine Arts	98		109	103.5	86		124	105
8	kinesiology	105	110	133	116		73	65	69
9	Physics	120	45	35	66.66666667	90	77	55	74
10	Grand Total	113.75	79.66666667	105.5	101.4545455	88	75	107.5	94.5
11									

# Example (3)

- Minimum of admissions

3	Min of Admissions	Semester				
4	Department	Fall	Spring	Winter	Grand Total	
5	Business	132	84	145	84	
6	Fine Arts	86		109	86	
7	kinesiology	105	73	65	65	
8	Physics	90	45	35	35	
9	Grand Total	86	45	35	35	

# Lookup Function

- Lookup functions can be used to find values (data) in a data table.
- Syntax:  
=Lookup(lookup\_value, lookup\_vector, result\_vector)  
=Lookup(lookup\_value, array)
- Example:  
=LOOKUP(A2, D2:D5, E2:E5)  
=LOOKUP(A2, {300, 500, 1000, 10000}, {5, 10, 20, 50})
- **Lookup vector should be in ascending order!**

# Example (1)

- Map point grades to letter grades using a lookup table.

	A	B	C	D	E	F
1	<b>Student</b>	<b>Point Grade</b>	<b>Letter Grade</b>		<b>Point</b>	<b>Grade</b>
2	Mike	3.2	B		0.0	F
3	Rose	2.8	C		2.0	D
4	Adam	3.6	A		2.5	C
5	David	2.4	D		3.0	B
6	Susan	1.9	F		3.5	A
7	Alxis	3.0	B			
8	Jim	2.1	D			
9	Jack	3.9	A			
10	Peter	3.3	B			
11	Jamey	2.6	C			
12	Chris	2.3	D			
13						

# Exercise

- Use a lookup table to compute the monthly **Salary Tax** based on the following tax rules:
  - Below \$2,500 is exempt from tax
  - Between \$2,500 and \$4,500 pays 10%
  - Between \$4,500 and \$7,000 pays 15%
  - Between \$7,000 and \$10,000 pays 20%
  - Above \$10,000 pays 30%

<b>Name</b>	<b>Monthly Salary</b>	<b>Salary Tax</b>
Mike	\$2,500.00	
Rose	\$3,500.00	
Adam	\$7,800.00	
David	\$4,800.00	
Sara	\$4,200.00	
Brad	\$1,800.00	
Jake	\$10,500.00	
Tim	\$5,000.00	
Susan	\$6,500.00	