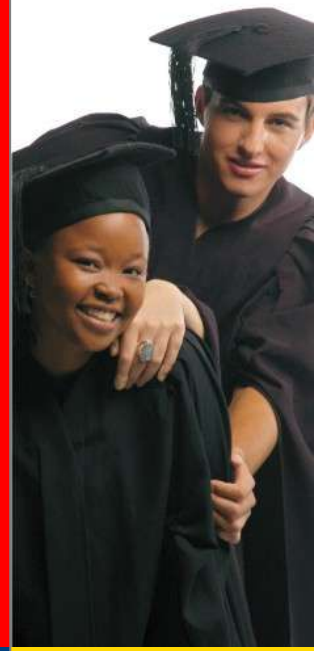
Live your life. Create your destiny.

CAT

Community Engagement Project



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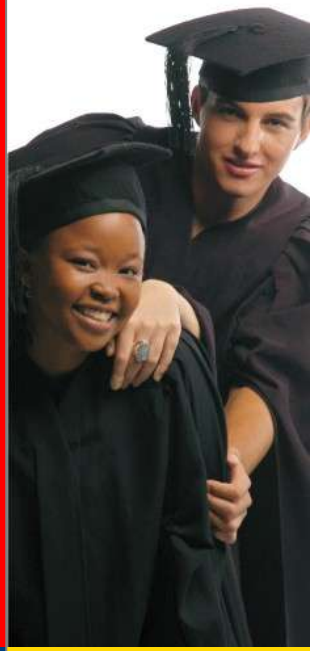
CAT

Community Engagement Project

Presented by:
Faculty of ICT in Collaboration with:
Department of Educational Studies &
Extended ICT Programme



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Yesterday

Yesterday…… Making backups seemed a waste of pay
Now my database has gone away….
Oh I believe in Yesterday…..
Suddenly…
There's not half the files there used to be…..
And a deadline's hanging over me..
The system crashed so suddenly…..

I pushed something wrong, what is was I couldn't say
Now…
my data's gone….
And I long…. For
Yesterday-ay-ay-ay

Yesterday…… Making backups seemed a waste of pay
Now my database has gone away….
Oh I believe in Yesterday…..

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Session1
Problem solving with:
Microsoft Office - Excel

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EXAMPLE 1: WORM JOURNEY

A worm is at the bottom of a 12 meter wall. Every day the worm crawls up 3 meters, but at night it slips down 2 meters. How many days does it take the worm to get to the top of the wall?

Day	Total distace travelled	Total Distance before night (+3)	Slip Down (-2)	New Distance in the Morning
1	0	3	2	1
2	1	4	2	2
3	2	5	2	3
4	3	6	2	4
5	4	7	2	5
6	5	8	2	6
7	6	9	2	7
8	7	10	2	8
9	8	11	2	9
10	9	12	2	10

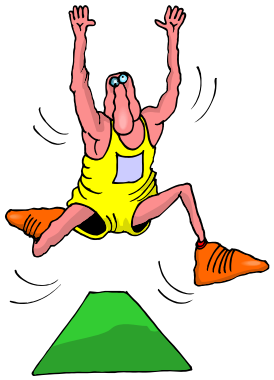
Day	Total distace travelled	Total Distance before night (+3)	Slip Down (-2)	New Distance in the Morning
1	0	=C4+3	2	=D4-E4
2	=F4	=C5+3	2	=D5-E5
3	=F5	=C6+3	2	=D6-E6
4	=F6	=C7+3	2	=D7-E7
5	=F7	=C8+3	2	=D8-E8
6	=F8	=C9+3	2	=D9-E9
7	=F9	=C10+3	2	=D10-E10
8	=F10	=C11+3	2	=D11-E11
9	=F11	=C12+3	2	=D12-E12
10	=F12	=C13+3	2	=D13-E13

EXAMPLE 2: Question 5 - Maths Literacy Paper 1 (Nov 2009)

Mrs Gumede is the long jump coach at her school. She has two good long jump athletes, Siyabonga and Charles. She wants to determine which one of the two is better. The following table shows a record of their longest jumps over the last eight practice sessions:

TABLE 2: Practice jumps in metres

Charles's distances	7,81	7,51	8,22	7,71	8,05	7,64	7,51	7,91
Siyabonga's distances	7,23	7,51	7,54	7,64	7,82	7,93	7,95	8,02



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EXAMPLE 2: Question 5 - Maths Literacy Paper 1 (Nov 2009)

5.1

5.1.1 Arrange the lengths of Charles's practice jumps in ascending order. (2)

5.1.2 Write down the mode of distances jumped by Charles. (1)

5.1.3 Calculate the range of the distances jumped by Siyabonga. (2)

5.1.4 Express the length of Siyabonga's shortest jump in centimetres. (1 m = 100 cm) (3)

5.1.5 Calculate the median length of Siyabonga's distances. (2)

5.1.6 Which of the two long jump athletes had more practice jumps that were further than 7,55 m? (2)

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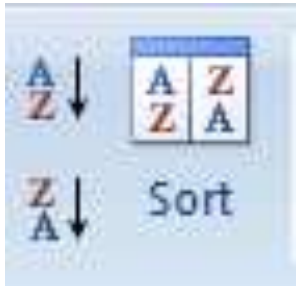
5.1.1 Arrange the lengths of Charles's practice jumps in ascending order. (2)

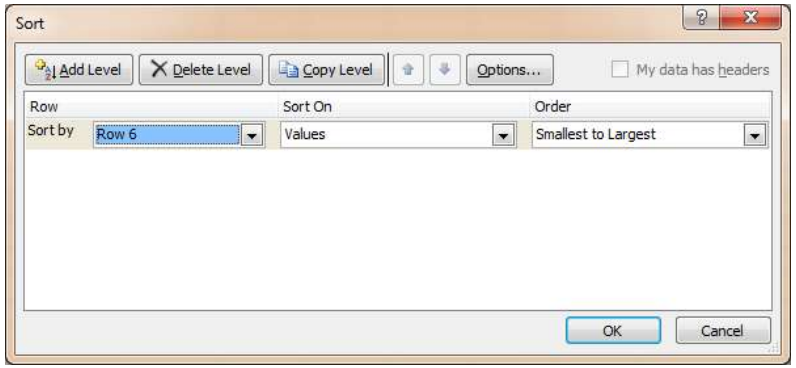
5									
6	5.1.1	Charles's distances	7.81	7.51	8.22	7.71	8.05	7.64	7.51	7.91
7									

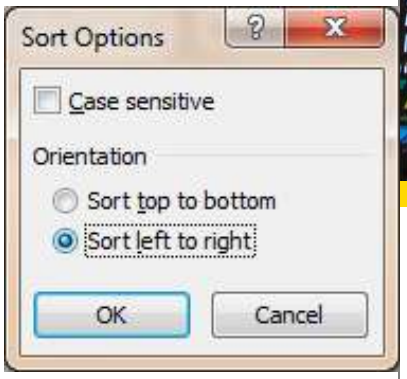
Select Cells to Sort

Select Sort + Sort Options

Sort Left to Right







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5.1.2 Write down the mode of distances jumped by Charles. (1)

	A	B	C	D	E	F	G	H	I	J
1		Practice Jumps								
2		Charles's distances	7.81	7.51	8.22	7.71	8.05	7.64	7.51	7.91
3		Siyabonga's distances	7.23	7.51	7.54	7.64	7.82	7.93	7.95	8.02

=MODE(C2:J2) → 7.51

In statistics, the **MODE** is the value that occurs the **most frequently** in a data set or a probability distribution.

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5.1.3 Calculate the range of the distances jumped by Siyabonga. (2)

	A	B	C	D	E	F	G	H	I	J
1		Practice Jumps								
2		Charles's distances	7.81	7.51	8.22	7.71	8.05	7.64	7.51	7.91
3		Siyabonga's distances	7.23	7.51	7.54	7.64	7.82	7.93	7.95	8.02

=MAX(C3:J3) - MIN(C3:J3)

0.79

In descriptive statistics, the range is the length of the smallest interval which contains all the data. It is calculated by subtracting the smallest observation (sample minimum) from the greatest (sample maximum) and provides an indication of statistical dispersion.

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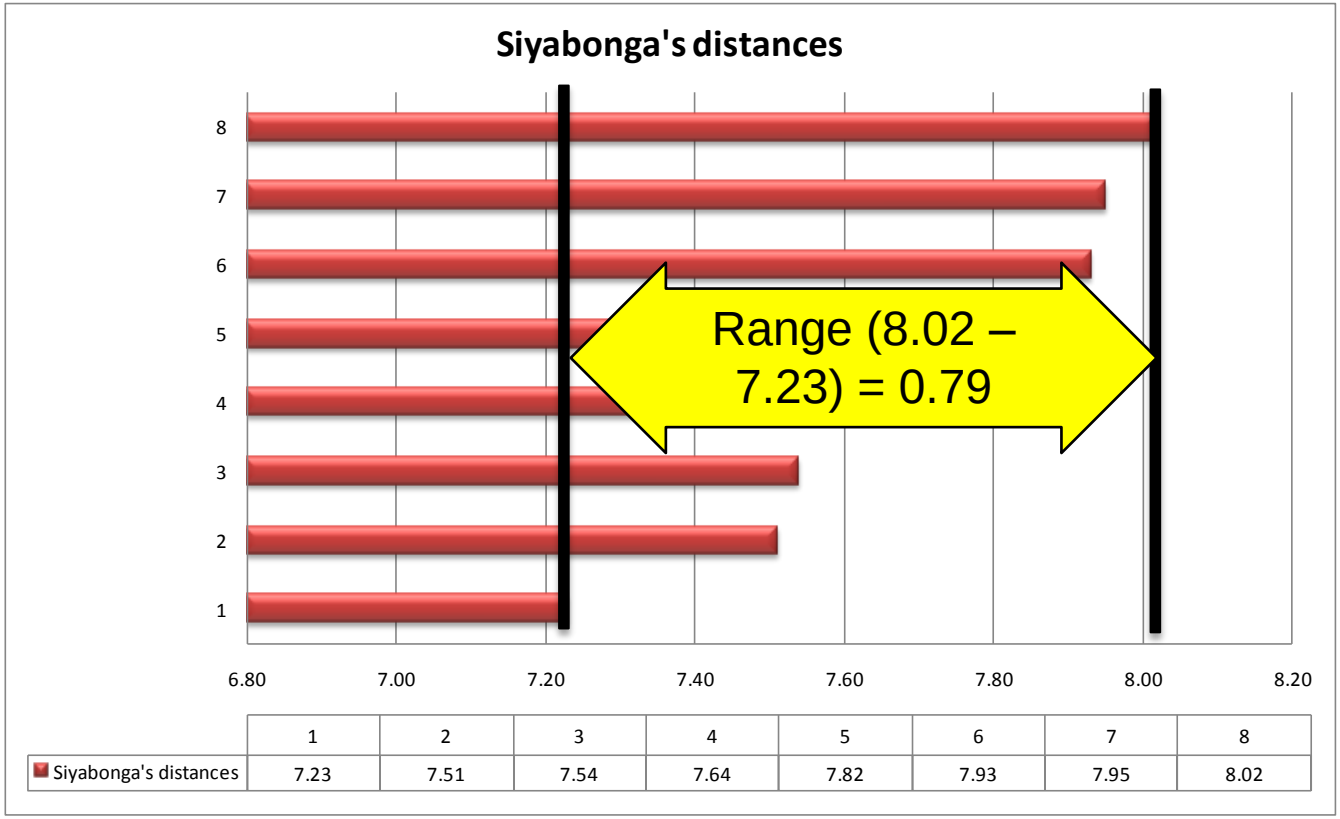
5.1.3 Calculate the range of the distances jumped by Siyabonga. (2)



	1	2	3	4	5	6	7	8
Siyabonga's distances	7.23	7.51	7.54	7.64	7.82	7.93	7.95	8.02

5.1.4 Express the length of Siyabonga's shortest jump in centimetres. (1 m = 100 cm) (3)

	A	B	C	D	E	F	G	H	I	J
1		Practice Jumps								
2		Charles's distances	7.81	7.51	8.22	7.71	8.05	7.64	7.51	7.91
3		Siyabonga's distances	7.23	7.51	7.54	7.64	7.82	7.93	7.95	8.02

=MIN(C3:J3) * 100 → 723

=CONCATENATE(TEXT(MIN(C3:J3) * 100,"0000")," cm's") → 0723 cm's

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5.1.5 Calculate the median length of Siyabonga's distances. (2)

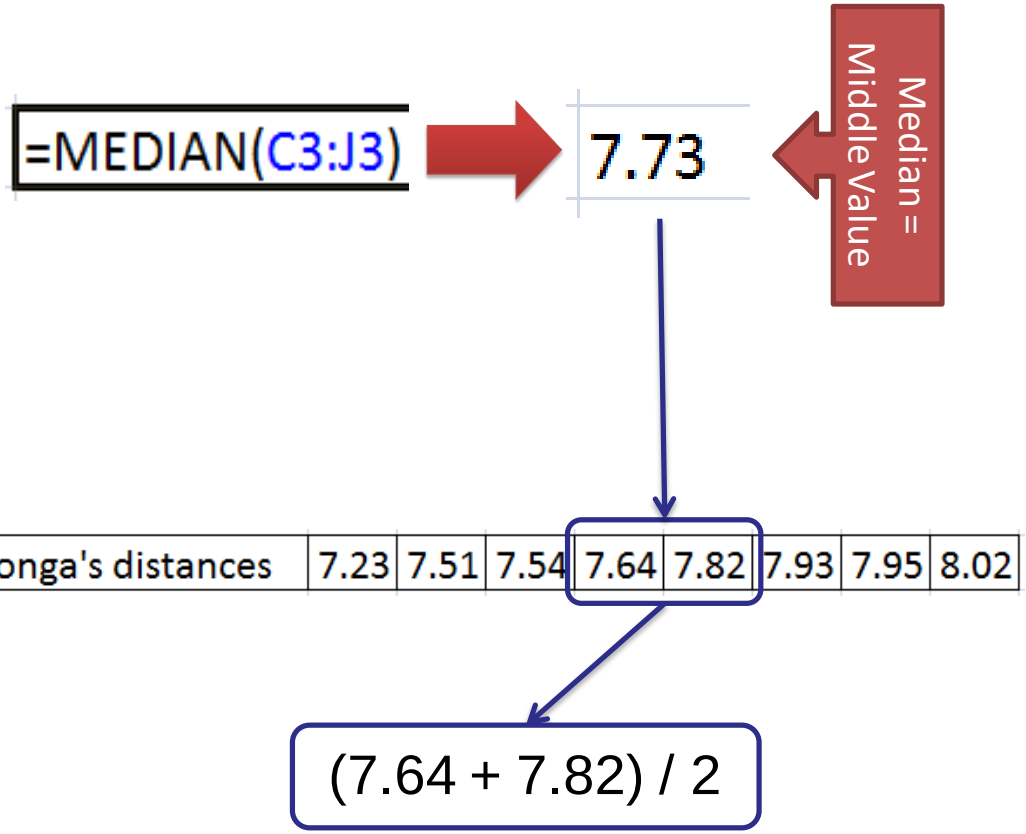
	A	B	C	D	E	F	G	H	I	J
1		Practice Jumps								
2		Charles's distances	7.81	7.51	8.22	7.71	8.05	7.64	7.51	7.91
3		Siyabonga's distances	7.23	7.51	7.54	7.64	7.82	7.93	7.95	8.02

=MEDIAN(C3:J3) → 7.73

In probability theory and statistics, a **median** is described as the numeric value separating the **higher half** of a sample, a population, or a probability distribution, from the **lower half**. The median of a finite list of numbers can be found by arranging all the observations from lowest value to highest value and picking the **middle one**. If there is an even number of observations, then there is no single middle value, so one often takes the mean of the two middle values.

5.1.5 Calculate the median length of Siyabonga's distances. (2)

	A	B	C	D	E	F	G	H	I	J
1		Practice Jumps								
2		Charles's distances	7.81	7.51	8.22	7.71	8.05	7.64	7.51	7.91
3		Siyabonga's distances	7.23	7.51	7.54	7.64	7.82	7.93	7.95	8.02



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5.1.6 Which of the two long jump athletes had more practice jumps that were further than 7,55 m? (2)

	A	B	C	D	E	F	G	H	I	J
1		Practice Jumps								
2		Charles's distances	7.81	7.51	8.22	7.71	8.05	7.64	7.51	7.91
3		Siyabonga's distances	7.23	7.51	7.54	7.64	7.82	7.93	7.95	8.02

The **COUNTIF** function counts the number of cells within a range that meet a single criterion that you specify.

=COUNTIF(C2:J2,">7.55") → 6 Charles

=COUNTIF(C3:J3,">7.55") → 5 Siyabonga

=IF

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5.1.6 Which of the two long jump athletes had more practice jumps that were further than 7,55 m? (2)

	A	B	C	D	E	F	G	H	I	J
1		Practice Jumps								
2		Charles's distances	7.81	7.51	8.22	7.71	8.05	7.64	7.51	7.91
3		Siyabonga's distances	7.23	7.51	7.54	7.64	7.82	7.93	7.95	8.02

=COUNTIF(C2:J2,">7.55") → 6 Charles

=COUNTIF(C3:J3,">7.55") → 5 Siyabonga

We would like EXCEL to determine the whether Siyabonga or Charles have had the most jumps over 7.55m. Therefore we could implement the IF function in excel to determine the winner.

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=COUNTIF(C2:J2,">7.55") → 6 Charles

=COUNTIF(C3:J3,">7.55") → 5 Siyabonga

=IF(COUNTIF(C2:J2,">7.55") > COUNTIF(C3:J3,">7.55"),"Charles","Siyabonga")

→ Charles

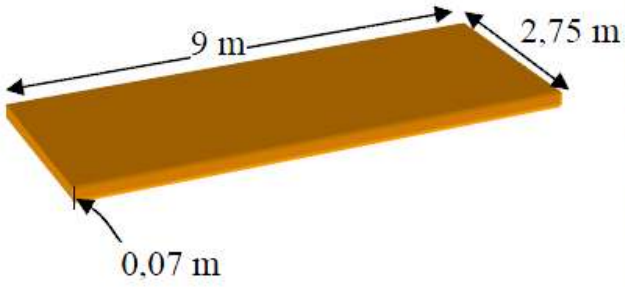
EXAMPLE 2 – Continued: Question 5.2 - Maths Literacy Paper 1 (Nov 2009)

	A	B	C
1	**Sand Pit Calculations**		
2	**Width**	9	m
3	**Length**	2.75	m
4	**Depth**	0.07	m
5			
6	**Volume**	=ROUND(B2*B3*B4,3)	m^3

Volume	1.733	m^3

EXAMPLE 2 – Continued: Question 5 - Maths Literacy Paper 1 (Nov 2009)

5.2 The rectangular long jump pit at the school is 2,75 m wide and 9 m long and is filled with sand.



Calculate the volume of sand needed to fill the long jump pit to a depth of 0,07 m. Give the answer rounded off to THREE decimal places.
Use the formula: **Volume = length × breadth × height** (3)

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EXAMPLE 2 – Continued: Question 5.3 - Maths Literacy Paper 1 (Nov 2009)

5.3

On 18 October 1968, Bob Beamon set the world long jump record when he jumped a distance of 8,90 m. This record was only broken on 30 August 1991. After how many years (rounded off to the nearest year) was Bob Beamon's record broken? (3)

Using the: DATEDIF function.

An Excel function called **DATEDIF()** is an old function used in versions of Excel prior to Office 2000. Although the function does not reflect in the Help files of newer versions of Excel it is still possible to use the function.

Format of the function:

=DATEDIF(*Date1, Date2, OutputRequirement*).

Using the: DATEDIF function.

NB:
Date2 > Date1

=DATEDIF(*Date1*, *Date2*, *OutputRequirementCode*)

Code : What must be displayed

Code	Description	Explanation
"d"	Days	The number of days between Date1 and Date2.
"m"	Months	The number of complete months between Date1 and Date2.
"y"	Years	The number of complete years between Date1 and Date2.
"yd"	Days excluding Years	The number of days between Date1 and Date2, as if Date1 and Date2 were in the same year.
"ym"	Months excluding Years	The number of months between Date1 and Date2, as if Date1 and Date2 were in the same year.
"md"	Days excluding Months and Years	The number of days between Date1 and Date2, as if Date1 and Date2 were in the same month and the same year.

http://www.meadinkent.co.uk/xl_birthday.htm

Using the: DATEDIF function.

-	A	B	C	D
30		First Date	Second Date	
31	Date as typed	02/05/97	06/06/07	
32	Date formatted	02 May 97	06 Jun 07	
33	Years	10	[B33] =DATEDIF(B31, C31, "Y")	
34	Months	1	[B34] =DATEDIF(B31, C31, "YM")	
35	Days	4	[B35] =DATEDIF(B31, C31, "MD")	

-	A
38	Your age is 10 years, 1 months and 4 days.
39	[A38] ="Your age is " & TEXT(B33, "0") & " years, " & TEXT(B34, "0") & " months and " & TEXT(B35, "0") & " days."

http://www.meadinkent.co.uk/xl_birthday.htm

EXAMPLE 2 – Continued: Question 5.3 - Maths Literacy Paper 1 (Nov 2009)

BOB BEAMANS LONG JUMP RECORD

Bobs Record date: 1968/10/18

New Record date: 1991/08/30

Record's "Age" : 22 Years and 10 Months

≈ 23 Years

EXAMPLE 2 – Continued: Question 5.3 - Maths Literacy Paper 1 (Nov 2009)

	A	B	C	D	E
1	BOB BEAMANS LO				
2					
3	Bobs Record date:	25129			
4	New Record date:	33480			
5					
6	Record's "Age" :	=DATEDIF(B3,B4,"Y")	Years and	=DATEDIF(B3,B4,"YM")	Months
7		≈ =ROUND(((B4-B3) / 365.25),0)	Years		

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EXAMPLE 3: Solving a "Programming type" question using Excel as a problem solving tool.

Basic Programming Principles using VB.NET

PROGRAM EXAMPLES

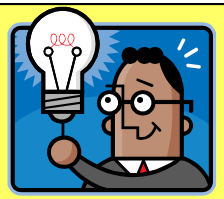
7.7.1 EXAMPLE 1

The Bright Light Company is increasing the salaries of their employees according to their department as can be seen in the table below.

Department code	Percentage increase
A	7.2
B	6.8
other	6.3

Do the planning and write an algorithm as well as a VB.NET application to solve this problem. The user has to enter the department code and the current annual salary of the employee. Calculate and display the increased monthly salary. Use a nested if statement without logical operators. Ensure that all data entered are correct.

EXAMPLE 3: Bright Light Company



Bright light Company

Employee Nr	Employee Details	Department Code	Annual Salary	Percentage Increase	New Annual Salary	New Monthly Salary
210111	Ben Boyd	A	R 120 000.00	7.2%	R 128 640.00	R 10 720.00
223231	Suzan Mahlangu	A	R 97 500.00	7.2%	R 104 520.00	R 8 710.00
355412	Mina Baloi	B	R 215 000.00	6.8%	R 229 620.00	R 19 135.00
564412	Brightson Ndoe	D	R 15 500.00	6.3%	R 16 476.50	R 1 373.04
434501	Ed Nel	B	R 145 000.00	6.8%	R 154 860.00	R 12 905.00
421554	Sannah Mampiri	E	R 102 000.00	6.3%	R 108 426.00	R 9 035.50
541234	Koos Kok	A	R 90 000.00	7.2%	R 96 480.00	R 8 040.00

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EXAMPLE 3: Bright Light Company

Brigh

Employee Nr	Employee Details	Department Code	Annual Salary	Percentage Increase	New Annual Salary	New Monthly Salary
210111	Ben Boyd	A	120000	=IF(C7="A",0.072,IF(C7="B",0.068,0.063))	=D7*(1+E7)	=F7/12
223231	Suzan Mahlangu	A	97500	=IF(C8="A",0.072,IF(C8="B",0.068,0.063))	=D8*(1+E8)	=F8/12
355412	Mina Baloi	B	215000	=IF(C9="A",0.072,IF(C9="B",0.068,0.063))	=D9*(1+E9)	=F9/12
564412	Brightson Ndoe	D	15500	=IF(C10="A",0.072,IF(C10="B",0.068,0.063))	=D10*(1+E10)	=F10/12
434501	Ed Nel	B	145000	=IF(C11="A",0.072,IF(C11="B",0.068,0.063))	=D11*(1+E11)	=F11/12
421554	Sannah Mampiri	E	102000	=IF(C12="A",0.072,IF(C12="B",0.068,0.063))	=D12*(1+E12)	=F12/12
541234	Koos Kok	A	90000	=IF(C13="A",0.072,IF(C13="B",0.068,0.063))	=D13*(1+E13)	=F13/12

IF for Ben Boyd to determine his increase percentage

`=IF(C7="A",0.072,IF(C7="B",0.068,0.063))` → 7.2%

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EXAMPLE 3: Bright Light Company ("Excel Form")

Bright light Company

Enter Current Yearly Salary	R 156 000.00
Enter Employee Department	B
New Yearly Salary	R 166 608.00
New Monthly Salary	R 13 884.00

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EXAMPLE 3: Bright Light Company ("Excel Form")

F12 | =F8*IF(F10="A",1.072,IF(F10="B",1.068,1.063))

Bright light Company

Enter Current Yearly Salary	R 156 000.00
Enter Employee Department	B
New Yearly Salary	R 166 608.00
New Monthly Salary	R 13 884.00

=F8*IF(F10="A",1.072,IF(F10="B",1.068,1.063))

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Microsoft Excel VLookup

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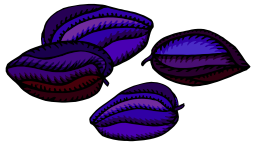
EXAMPLE 4: Looking up the value of a cell in a table.



Looking up a value in a table with a row and column

	Class 1	Class 2	Class 3
Apples	*R 30.00*	*R 20.00*	*R 10.00*
Pears	*R 30.50*	*R 20.50*	*R 10.50*
Prunes	*R 25.50*	*R 18.75*	*R 12.50*

Lookup value from table		
Apples	Class 1	*R 30.00*
Pears	Class 2	*R 20.50*
Prunes	Class 3	*R 12.50*
Pears	Class 3	*R 10.50*
Prunes	Class 1	*R 25.50*

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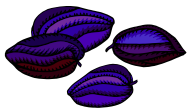

EXAMPLE 4: Looking up the value of a cell in a table.

C9 =IF(B9="Class 1",VLOOKUP(A9,$A$4:$B$6,2,FALSE),IF(B9="Class 2",VLOOKUP(A9,$A$4:$C$6,3,FALSE),VLOOKUP(A9,$A$4:$D$6,4,FALSE)))

	A	B	C	D
1	Looking up a val			
2				
3		Class 1	Class 2	Class 3
4	Apples	30	20	10
5	Pears	30.5	20.5	10.5
6	Prunes	25.5	18.75	12.5
7				
8	Lookup value fr			
9	Apples	Class 1	=IF(B9 ="Class 1",\	
10	Pears	Class 2	=IF(B10="Class 1",	
11	Prunes	Class 3	=IF(B11="Class 1",	
12	Pears	Class 3	=IF(B12="Class 1",	
13	Prunes	Class 1	=IF(B13="Class 1",	

```
=IF(B9="Class 1",VLOOKUP(A9,$A$4:$B$6,2,FALSE),IF(B9="Class 2",VLOOKUP(A9,$A$4:$C$6,3,FALSE),VLOOKUP(A9,$A$4:$D$6,4,FALSE)))
```

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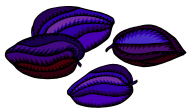

EXAMPLE 4: Looking up the value of a cell in a table.

C9 =IF(B9="Class 1",VLOOKUP(A9,$A$4:$B$6,2,FALSE),IF(B9="Class 2",VLOOKUP(A9,$A$4:$C$6,3,FALSE),VLOOKUP(A9,$A$4:$D$6,4,FALSE)))

	A	B	C	D
1	Looking up a val			
2				
3		Class 1	Class 2	Class 3
4	Apples	30	20	10
5	Pears	30.5	20.5	10.5
6	Prunes	25.5	18.75	12.5
7				
8	Lookup value fr			
9	Apples	Class 1	=IF(B9 ="Class 1",\	
10	Pears	Class 2	=IF(B10="Class 1",	
11	Prunes	Class 3	=IF(B11="Class 1",	
12	Pears	Class 3	=IF(B12="Class 1",	
13	Prunes	Class 1	=IF(B13="Class 1",	

```
=IF(B9="Class 1",VLOOKUP(A9,$A$4:$B$6,2,FALSE),IF(B9="Class 2",VLOOKUP(A9,$A$4:$C$6,3,FALSE),VLOOKUP(A9,$A$4:$D$6,4,FALSE)))
```

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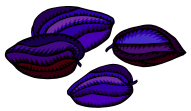

EXAMPLE 4: Looking up the value of a cell in a table.

C9 =IF(B9="Class 1",VLOOKUP(A9,$A$4:$B$6,2,FALSE),IF(B9="Class 2",VLOOKUP(A9,$A$4:$C$6,3,FALSE),VLOOKUP(A9,$A$4:$D$6,4,FALSE)))

	A	B	C	D
1	Looking up a val			
2				
3		Class 1	Class 2	Class 3
4	Apples	30	20	10
5	Pears	30.5	20.5	10.5
6	Prunes	25.5	18.75	12.5
7				
8	Lookup value fr			
9	Apples	Class 1	=IF(B9 ="Class 1",\	
10	Pears	Class 2	=IF(B10="Class 1",	
11	Prunes	Class 3	=IF(B11="Class 1",	
12	Pears	Class 3	=IF(B12="Class 1",	
13	Prunes	Class 1	=IF(B13="Class 1",	

```
=IF(B9="Class 1",VLOOKUP(A9,$A$4:$B$6,2,FALSE),IF(B9="Class 2",VLOOKUP(A9,$A$4:$C$6,3,FALSE),VLOOKUP(A9,$A$4:$D$6,4,FALSE)))
```

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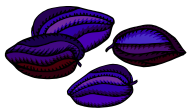
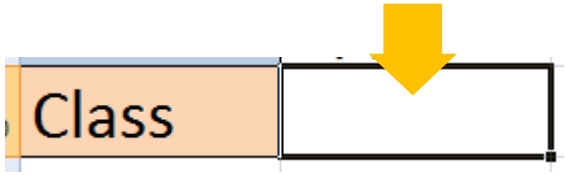


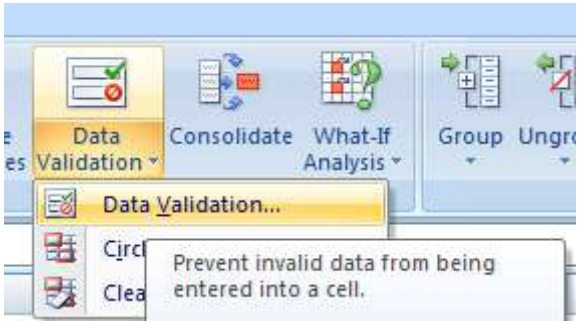
EXAMPLE 4: Creating a Dropdown-List

1



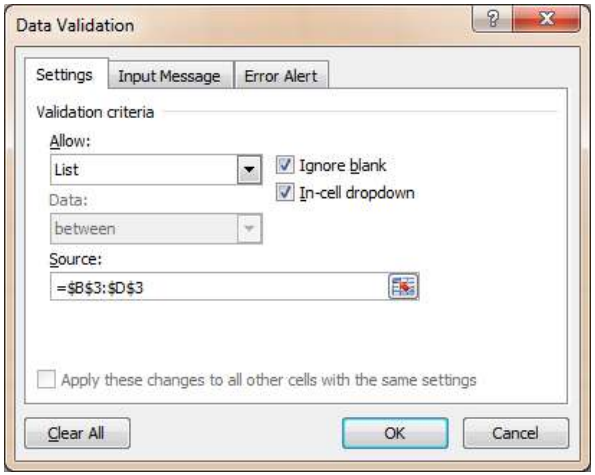
Select the Cell where you want the Dropdown List to be.

2



Select Data Validation on the Data tab.

3



Select List and select the Source of the data to be displayed. You may also add an Input message as well as an Error Alert message,

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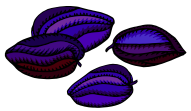


EXAMPLE 4: Creating a Dropdown-List

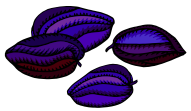
9	Product	Apples
10	Class	

Apples
Pears
Prunes

9	Product	Apples
10	Class	Class 2
11		

Class 1
Class 2
Class 3

9	Product	Apples
10	Class	Class 2



EXAMPLE 4: Using the MATCH and INDEX functions

The **MATCH** function searches for a specified item in a range of cells, and then returns the relative position of that item in the range.

For example, if the range **A1:A3** contains the values **5, 25,** and **38,** then the formula

=MATCH(25,A1:A3,0)

returns the number **2**, because **25** is the second item in the range.

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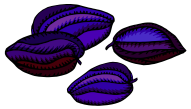


EXAMPLE 4: Using the MATCH and INDEX functions

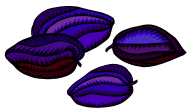
The **INDEX** function returns a value or the reference to a value from within a table or range.

There are two forms of the **INDEX** function: the **array form**

- **Return the value of a specified cell or array of cells**

and the **reference form**.

- **Return a reference to specified cells**



EXAMPLE 4: Using the MATCH and INDEX functions

	A	B	C	D	E	F	G
1	**Looking up a value in a table with a row and column**						
2							
3		Class 1	Class 2	Class 3			
4	Apples	*R 30.00*	*R 20.00*	*R 10.00*			
5	Pears	*R 30.50*	*R 20.50*	*R 10.50*			
6	Prunes	*R 25.50*	*R 18.75*	*R 12.50*			
7							
8							
9	Product	Pears	*2*				
10	Class	Class 3	*3*	*R 10.50*			

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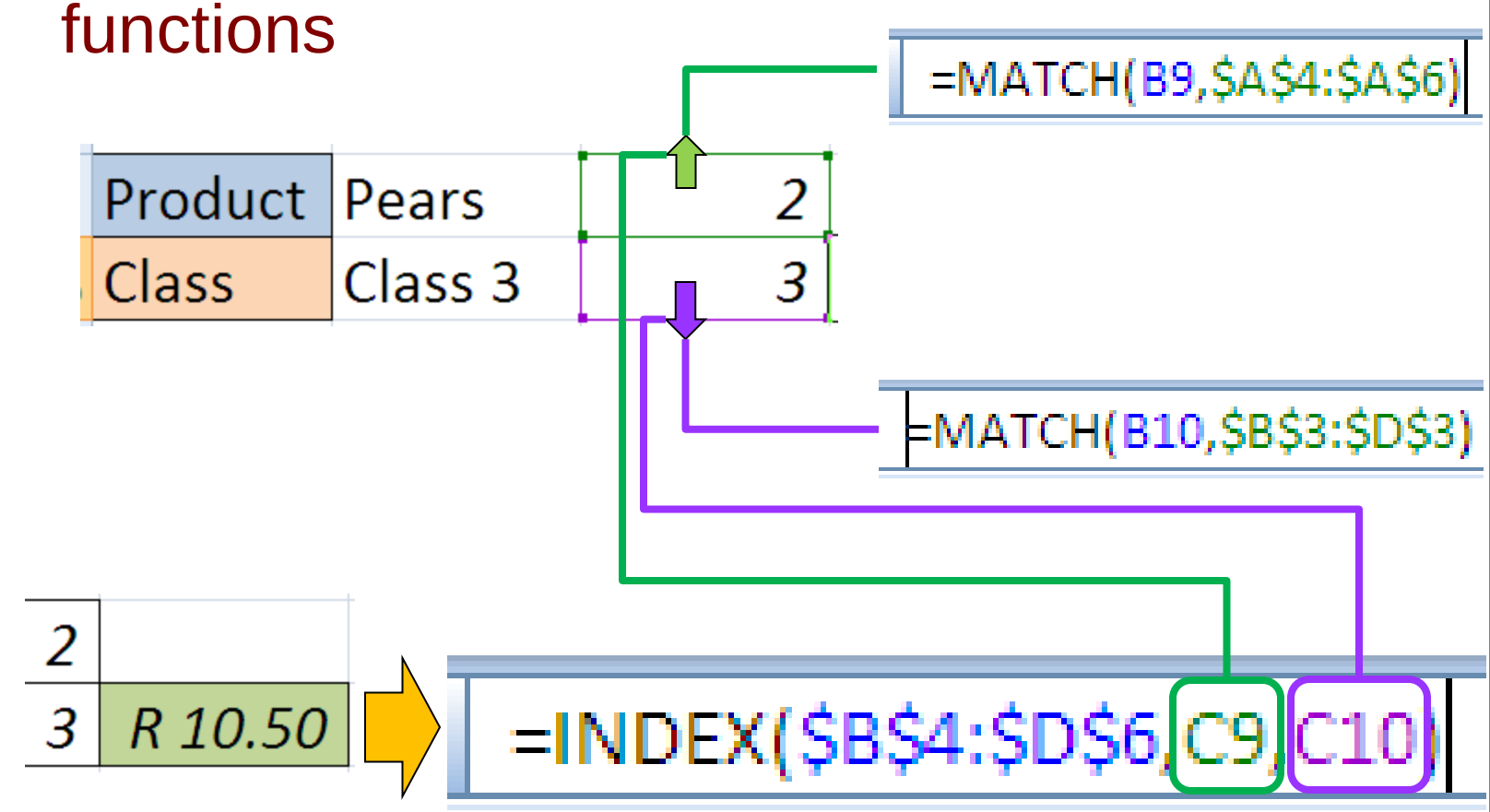
EXAMPLE 4: Using the MATCH and INDEX functions



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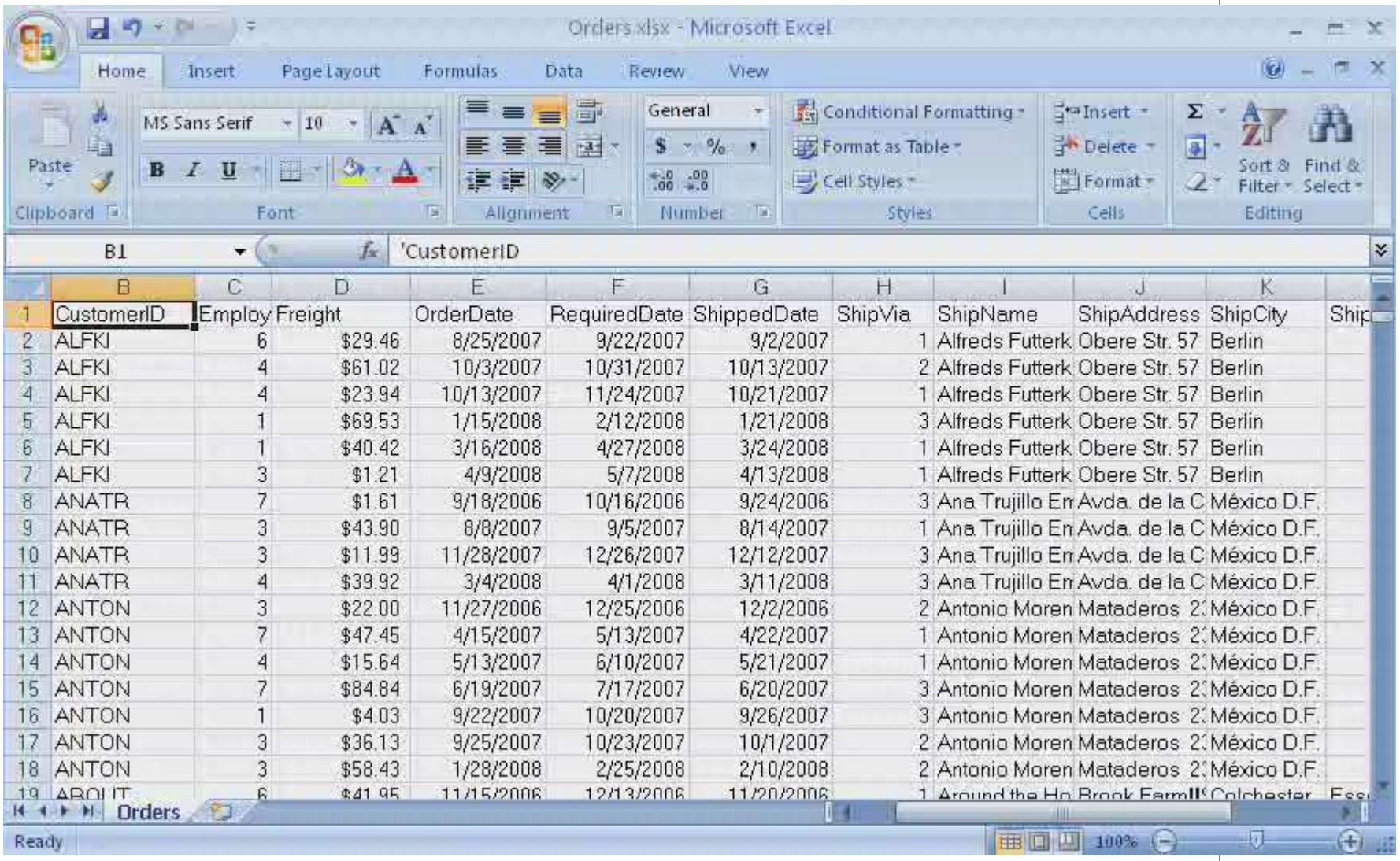
Conditional Formatting



	B	C	D	E	F	G	H	I	J	K	
1	CustomerID	Employ	Freight	OrderDate	RequiredDate	ShippedDate	ShipVia	ShipName	ShipAddress	ShipCity	Ship
2	ALFKI	6	$29.46	8/25/2007	9/22/2007	9/2/2007	1	Alfreds Futterk	Obere Str. 57	Berlin	
3	ALFKI	4	$61.02	10/3/2007	10/31/2007	10/13/2007	2	Alfreds Futterk	Obere Str. 57	Berlin	
4	ALFKI	4	$23.94	10/13/2007	11/24/2007	10/21/2007	1	Alfreds Futterk	Obere Str. 57	Berlin	
5	ALFKI	1	$69.53	1/15/2008	2/12/2008	1/21/2008	3	Alfreds Futterk	Obere Str. 57	Berlin	
6	ALFKI	1	$40.42	3/16/2008	4/27/2008	3/24/2008	1	Alfreds Futterk	Obere Str. 57	Berlin	
7	ALFKI	3	$1.21	4/9/2008	5/7/2008	4/13/2008	1	Alfreds Futterk	Obere Str. 57	Berlin	
8	ANATR	7	$1.61	9/18/2006	10/16/2006	9/24/2006	3	Ana Trujillo Em	Avda. de la C	México D.F.	
9	ANATR	3	$43.90	8/8/2007	9/5/2007	8/14/2007	1	Ana Trujillo Em	Avda. de la C	México D.F.	
10	ANATR	3	$11.99	11/28/2007	12/26/2007	12/12/2007	3	Ana Trujillo Em	Avda. de la C	México D.F.	
11	ANATR	4	$39.92	3/4/2008	4/1/2008	3/11/2008	3	Ana Trujillo Em	Avda. de la C	México D.F.	
12	ANTON	3	$22.00	11/27/2006	12/25/2006	12/2/2006	2	Antonio Moren	Mataderos 2	México D.F.	
13	ANTON	7	$47.45	4/15/2007	5/13/2007	4/22/2007	1	Antonio Moren	Mataderos 2	México D.F.	
14	ANTON	4	$15.64	5/13/2007	6/10/2007	5/21/2007	1	Antonio Moren	Mataderos 2	México D.F.	
15	ANTON	7	$84.84	6/19/2007	7/17/2007	6/20/2007	3	Antonio Moren	Mataderos 2	México D.F.	
16	ANTON	1	$4.03	9/22/2007	10/20/2007	9/26/2007	3	Antonio Moren	Mataderos 2	México D.F.	
17	ANTON	3	$36.13	9/25/2007	10/23/2007	10/1/2007	2	Antonio Moren	Mataderos 2	México D.F.	
18	ANTON	3	$58.43	1/28/2008	2/25/2008	2/10/2008	2	Antonio Moren	Mataderos 2	México D.F.	
19	AROUT	6	$41.95	11/15/2006	12/13/2006	11/20/2006	1	Around the Ho	Brook Farm	Colchester	Ess

Sudoku Magic

♥

Logic

THINK BEFORE YOU INK!

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EXAMPLE 5: Conditional Formatting

Soduko Magic

1	2	3	1	2	3	1	2	3	↑18
4	5	6	4	5	6	4	9	6	↓49
7	8	9	7	8	6	7	8	6	↓66
1	2	3	1	2	3	1	2	3	↑18
4	5	6	4	5	6	4	5	6	→45
7	8	6	7	8	5	7	9	9	↓66
8	2	3	1	2	3	1	2	3	↑25
7	9	6	4	5	6	4	5	6	↓52
6	8	6	7	8	6	7	8	9	↓65
→45	↓49	↓48	↑36	→45	↑44	↑36	↓50	↓51	

EXAMPLE 6: String functions – ID Validation

ID Number 800101 5009 087

Add all the digits in the odd positions (excluding last digit).
8 + 0 + 0 + 5 + 0 + 0 = 13.....[1]
Move the even positions into a field and multiply the number by 2.
011098 x 2 = 22196
Add the digits of the result in b).
2 + 2 + 1 + 9 + 6 = 20.....[2]

Add the answer in [2] to the answer in [1].
13 + 20 = 33
Subtract the second digit (i.e. 3) from 10. The number must tally with the last number in the ID Number. If the result is 2 digits, the last digit is used to compare against the last number in the ID Number. If the answer differs, the ID number is invalid.

EXAMPLE 6: String functions – ID Validation

	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8
9203125122086	1	9	9	0	0	464256	4	4
	2	2	0	2	2		6	6
	3	0	0	0	0		4	4
	4	3	0	3	3		2	2
	5	1	1	0	0		5	5
	6	2	0	2	2		6	6
	7	5	5	0	0			
	8	1	0	1	1			
	9	2	2	0	0			
	10	2	0	2	2			
	11	0	0	0	0			
	12	8	0	8	8			
	13	6						
Sum Odd (A)			17		232128	Sum New (B)		27
					464256			
C = Sum (A + B)			44					
D = Last Digit of C			4					
E = Checkdigit (10-C)			6		F = Last Digit of ID			6
Valid ID								
Age	920312			92/03/12				

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FUN IN TEACHING EXCEL

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Excel Charts

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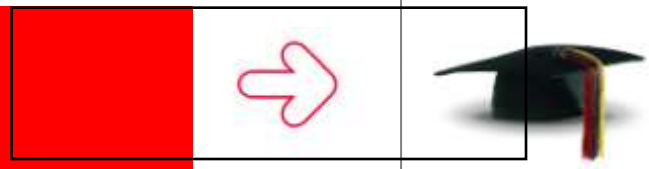
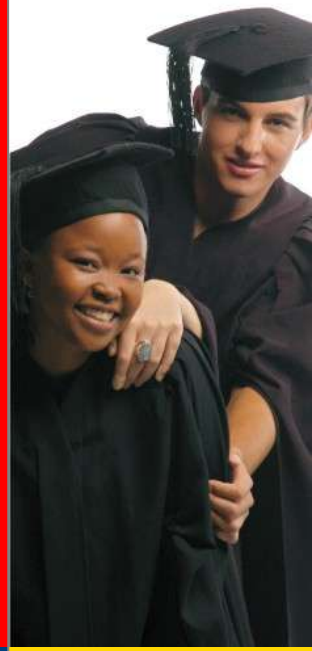


e-Break



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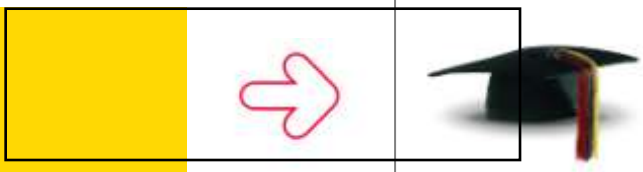
CAT : Community Engagement Project



Session1
Problem solving with:
Microsoft Office - Access

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Database Concepts with MS Access

Compiled by:
Wendy Birch
adapted by
Bertie Buitendag

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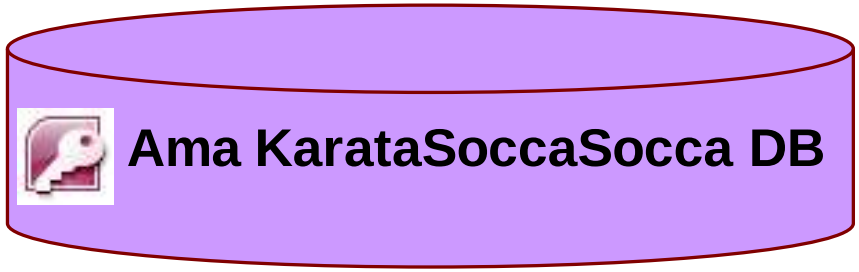
Example 1 – Socca DB

Scenario:

South Africa hosted the Confederations cup successfully, and the Bafana Bafana made us proud with their performance. The data regarding the Bafana Bafana team who participated in the Confederations Cup is presented in the



The data data to populate the tables in the DB was obtained from Wikipedia and is subject to scrutiny, and some field values are fictional.

TAKE NOTE: For sample purposes, one additional player has been added. This player has no affiliation with SAFA or Bafana Bafana but is a great supporter of the game. This player is known as the Joker.

Example 1 – Socca DB

Player - table

Relationships | Club | Player

Field Name	Data Type
PlayerID	Number
PlayerPos	Text
PlayerName	Text
PlayerSurname	Text
PlayerDOB	Date/Time
PlayerCaps	Number
PlayerGoals	Number
PlayerClub	Text
PlayerIsCaptain	Yes/No
PlayerPicture	OLE Object
PlayerCharityEarnings	Currency

1 ∞

Relationships | Club

Field Name	Data Type
ClubID	Text
ClubName	Text
ClubCountry	Text
ClubNickname	Text
ClubFoundingYear	Number
ClubGrounds	Text
ClubGroundCapacity	Number

Club - table

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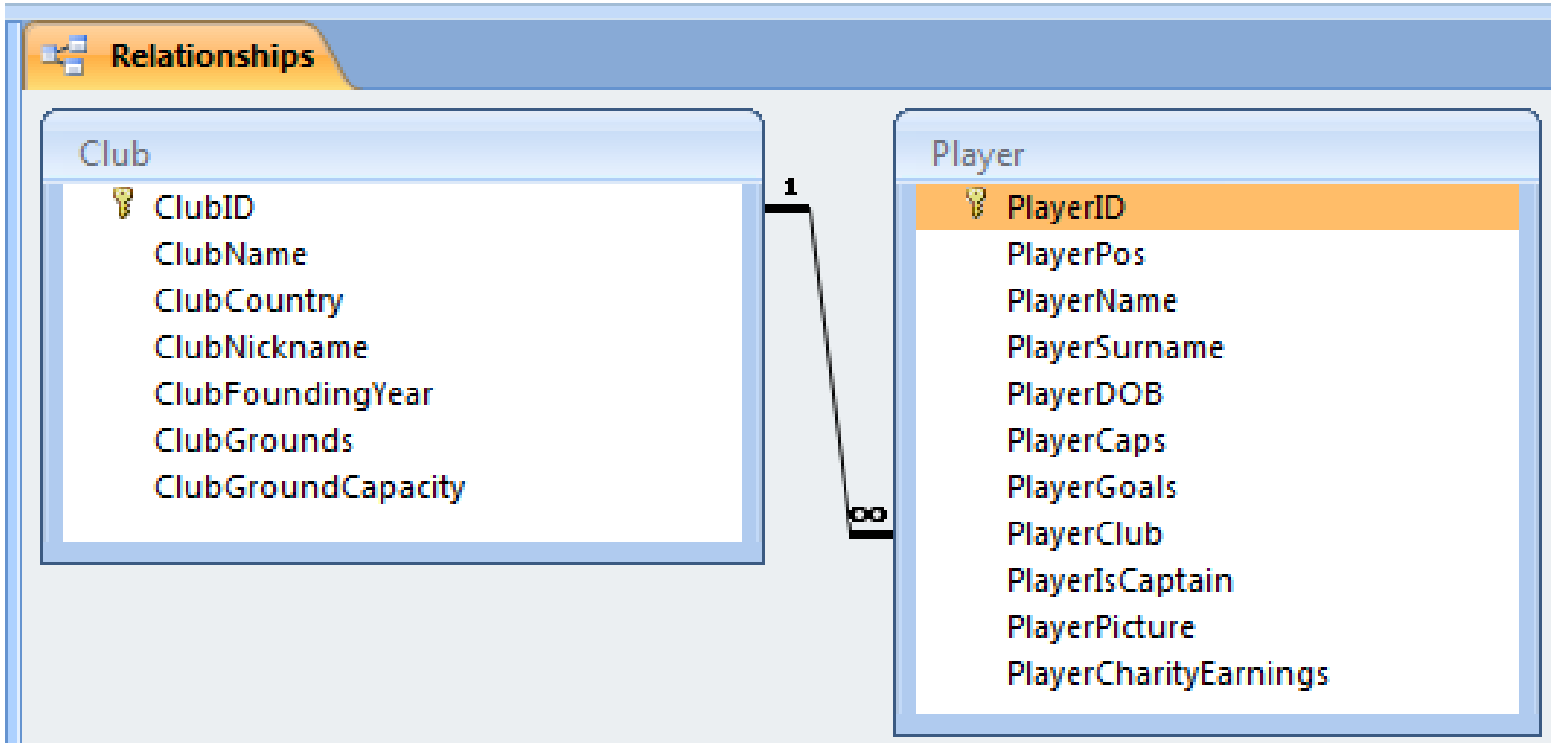
Example 1 – Socca DB



Validation Rules

A defined set of rules to regulate the input of data.

Validation rules:

- Certify accuracy of data.
- Eliminate erroneous data.
- Ensure availability of data.

Validation Rules

Checking What?	Field	Data Type	Valid Data	Invalid Data	Error
No numbers	NAME	text only	Peggy Zola	P3ggy Zol4	Name contains digits
No characters	POSTAL CODE	whole numbers only	2097	2097A	Code contains characters
Within range	CONTRACT FEE	Between R25.00 and R75.00	R60.00	R95.00	Amount is higher than limit allows
Can logically exist	DATE BORN DATE JOINED	first date occurs before second date	21-Oct-2004 23-Oct-2004	21-Oct-2004 23-Sept-2004	Cannot join the scheme before birth
Not empty	ID NUMBER	13-digit number	8206145136095		Field cannot be empty

Validation Rule

Player

Field Name	Data Type
PlayerID	Number
PlayerPos	Text

General | Lookup

Field Size	2
Format	@
Input Mask	"Enter Player Position [DF, MF, FW, GK, JK] "
Caption	Position
Default Value	"MF"
Validation Rule	IN ("FW","MF","DF","JK","GK")
Validation Text	Validation Rule ="DF" Or "MF" Or "FW" Or "GK" Or "JK"
Required	Yes
Allow Zero Length	Yes
Indexed	No
Unicode Compression	No
IME Mode	No Control
IME Sentence Mode	None
Smart Tags	

Working with Forms

Players

PlayerID	1
PlayerName	Rowen
Player Position	GK
PlayerSurname	Fernández
PlayerDOB	1978/02/28
PlayerCaps	19
PlayerGoals	0
PlayerIsCaptain	
PlayerClubCode	ARMB01
PlayerPicture	

Age 32

Strikerate 1.50

Queries

What is a query:

- Filtered information.
- A request for specific data from the database.
- Most powerful & convenient facet of a database.

Queries - Operators

>	greater than
<	less than
>=	greater than or equal to
<=	less than or equal to
between… and…	For a result that falls between the 2 boundaries

Queries - Operators

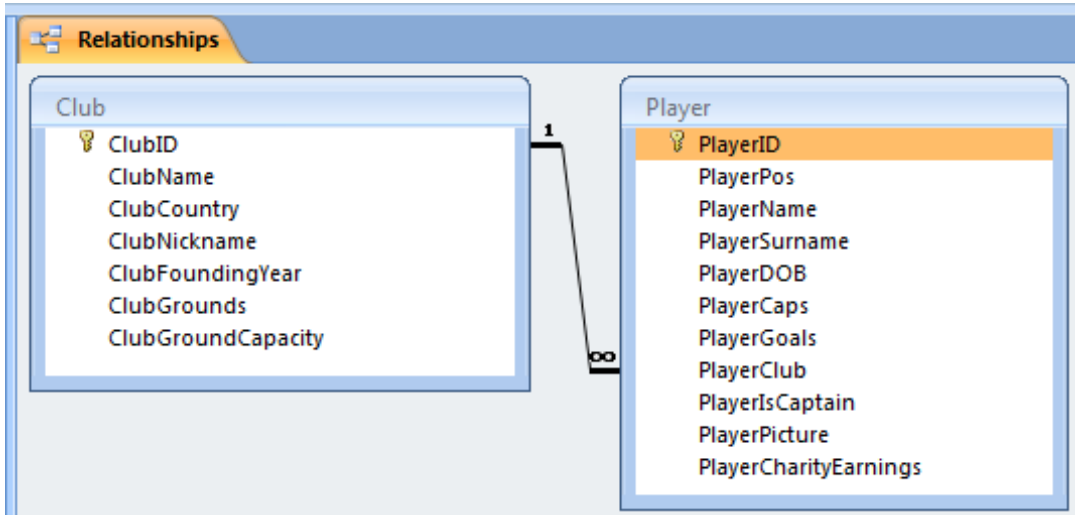
- not
- in(…)
- like
- is null
- is not null”
- “ ”
- “ … ”

- For every other field except the one listed.
- results within the given range
- results that start with whatever comes after ‘like’
- for missing or unknown data. null = blank
- the same as

Queries

Example 1

Retrieve all the records and list all the fields from the Player table of players excluding the Goalkeepers who have played at least 15 matches. The retrieved records should be sorted according to the surname of the player in descending sequence.



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Queries Example 1

Player | QueryExample1

PlayerID	Position	PlayerName	PlayerSurna	PlayerDOB	PlayerCaps	PlayerGoals	PlayerClub	PlayerIsCap	PlayerCharit
11	MF	Elrio	van Heerden	1983/07/11	28	3	BLCR09	☐	R 43 000.00
8	MF	Siphiwe	Tshabalala	1984/09/25	32	3	KZRC07	☐	R 25 670.00
6	MF	MacBeth	Sibaya	1977/11/25	52	0	RUBK06	☐	R 12 600.00
10	MF	Steven	Pienaar	1982/03/17	43	2	EVRT08	☐	R 20 250.00
17	FW	Bernard	Parker	1986/03/16	19	7	TWEN11	☐	R 13 760.00
19	DF	Bryce	Moon	1986/04/06	15	1	PANT12	☐	R 65 400.00
4	DF	Aaron	Mokoena	1980/11/25	90	1	PORM04	☑	R 21 000.00
12	MF	Teko	Modise	1982/12/22	37	9	ORLP05	☐	R 18 350.00
5	MF	Benson	Mhlongo	1980/11/09	31	1	ORLP05	☐	R 56 750.00
3	DF	Tsepo	Masilela	1985/05/05	24	0	MACH03	☐	R 34 750.00
2	DF	Siboniso	Gaxa	1984/04/06	24	0	MAMS02	☐	R 52 500.00
24	JK	AmaBertboy	FatiTwakkie	1977/08/13	100	100	JOKER1	☐	R 200 000.00
18	FW	Thembinkosi	Fanteni	1984/02/02	19	2	MACH03	☐	R 24 380.00
13	MF	Kagiso	Dikgacoi	1984/11/24	26	2	GOLA10	☐	R 16 500.00
7	MF	Lance	Davids	1985/04/11	16	0	SUPN13	☐	R 16 500.00
14	DF	Matthew	Booth	1977/03/14	24	1	MAMS02	☐	R 11 100.00

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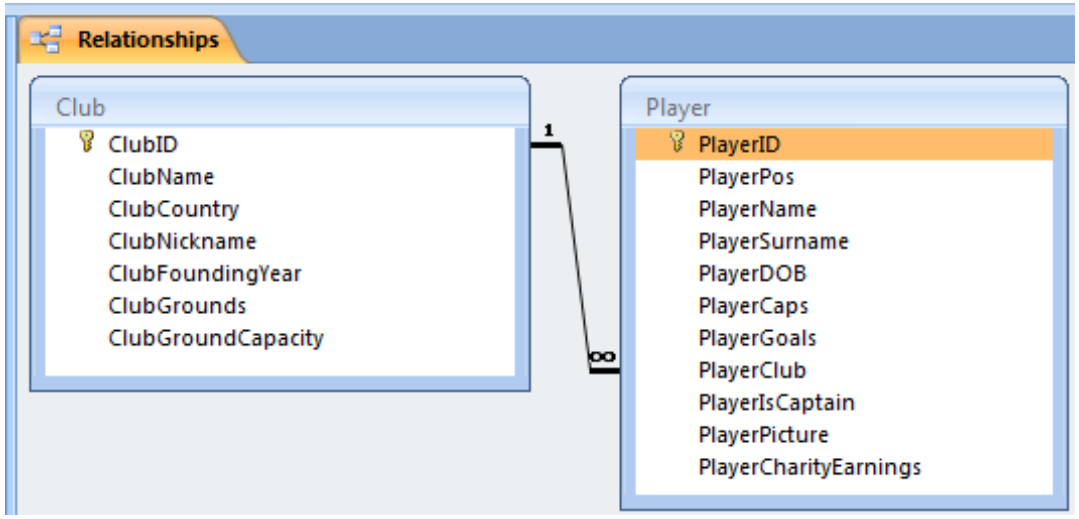
Queries

Example 2

Retrieve the records from a database which will adhere to the following specifications: Display the PlayerID, PlayerPos, PlayerName and PlayerSurname concatenated as PlayerFullName as well as the Players Clubname of all players belonging to a South African Club.



Queries Example 2

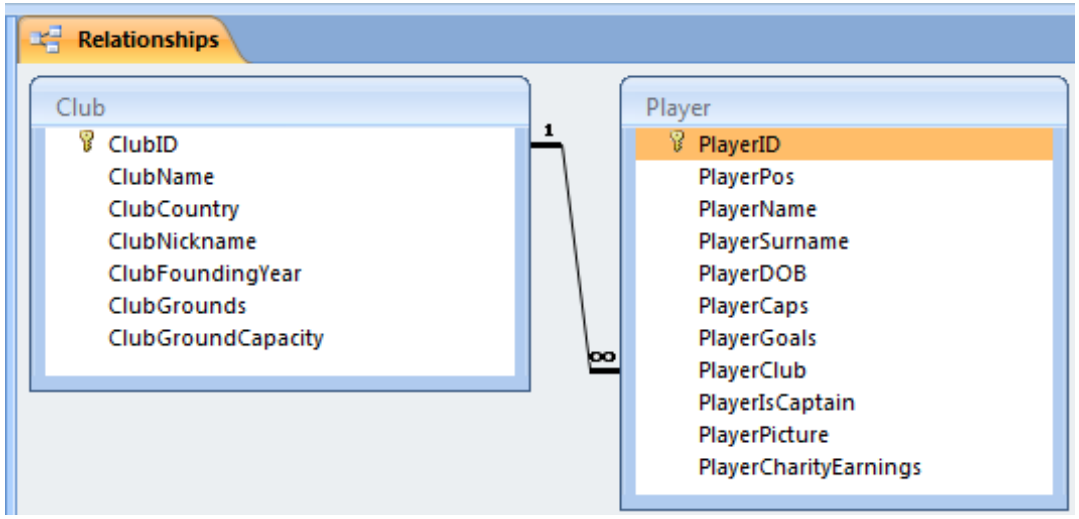
Player | Query2

PlayerID	Position	Player Full Name
13	MF	Kagiso Dikgacoi
24	JK	AmaBertboy FatiTwakkie
8	MF	Siphiwe Tshabalala
16	GK	Itumeleng Khune
2	DF	Siboniso Gaxa
9	FW	Katlego Mphela
14	DF	Matthew Booth
22	GK	Brian Baloyi
5	MF	Benson Mhlongo
12	MF	Teko Modise
15	DF	Innocent Mdledle
21	FW	Katlego Mashego
7	MF	Lance Davids
20	DF	Bongani Khumalo
23	DF	Morgan Gould

Queries

Example 3

Return the PlayerID and PlayerSurnames, PlayerDOB and calculated PlayerAge displayed as an Integer of all the players who were born during months of which the month number is even and which surname contain an ‘a’ as the second letter.



Queries Example 3

QueryExample3

PlayerID	PlayerSurna	PlayerDOB	Player Age
2	Gaxa	1984/04/06	26
7	Davids	1985/04/11	25
18	Fanteni	1984/02/02	26
24	FatiTwakkie	1977/08/13	33
*			

Reports

What is a Report

- A summary of the data in the database.
- Reports are created using table or queries or both.
- The nature of the report will depend upon the requirements of the reader.

Reports

Practical Example

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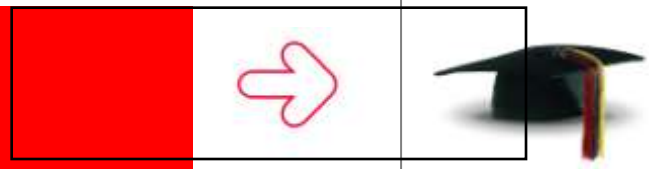
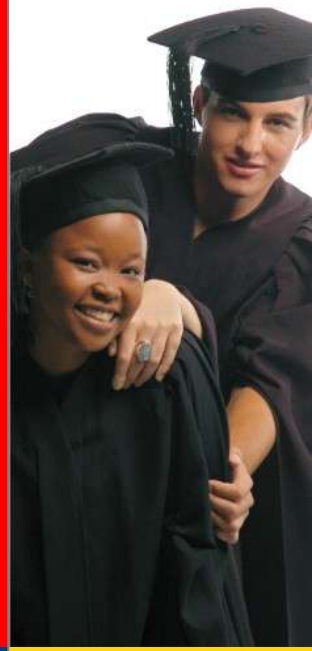


Lunch
Lab Time



Tshwane University of Technology

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