

# Excel PONG Tutorial #8

by George Lungu

- creating a score display

	SET 1	SET 2	SET 3	SET 4	GAMES	POINTS		
SMITH	4	6	6	6	2	4	3	0
JONES	6	3	0	3	2	0	0	5

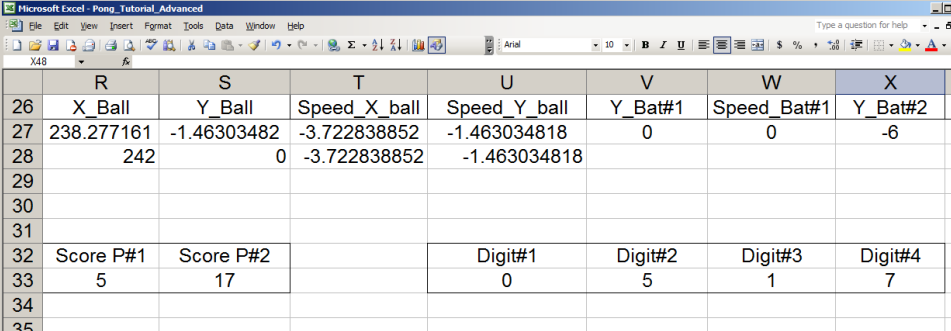
- The previous tutorial showed how to associate sound effects (including crowd applause and laughter) to ball collision events. This section (which is a continuation of part#7) will introduce a game score display built in the upper part of the pong court. Next tutorial will explain how to implement macros for driving the display.

## 46. Create a new copy of the worksheet

- In the folder "Pong\_Tutorial\_Archive" open Pong\_Tutorial\_Advanced.xls and copy the only existent worksheet (Pong\_Tutorial\_7). Rename the new worksheet Pong\_Tutorial\_8.
- Using the VBA editor insert a new module, Module2. Copy all the code from Module1 into Module2.
- Change the name of the Serve\_7 macro into Serve\_8.
- Change the name of the Play\_Tutorial\_7 macro into Play\_Tutorial\_8.
- Change the name of the Collision\_Effects\_7 macro into Collision\_Effects\_8.
- Reassign the Serve\_8 and Play\_Tutorial\_8 to the Serve and Play buttons in the new worksheet.
- Reassign the Enable\_Sounds macro attached to the new worksheet to the new Enable\_Sounds button.

## 47. Build a "Score Area" in the new worksheet

- The a player scores a point when the opposing player misses the ball
- The maximum score will be 99 and the player who reaches that score number first wins
- A macro will paste the score of player #1 (left player , the virtual player) in cell R33 and the score of player #2 in cell S33.
- Range U33:X33 contains the formulas for extracting individual digits from the scores of both players (U33:V33 for player #1 and W33:X33 for player #2).



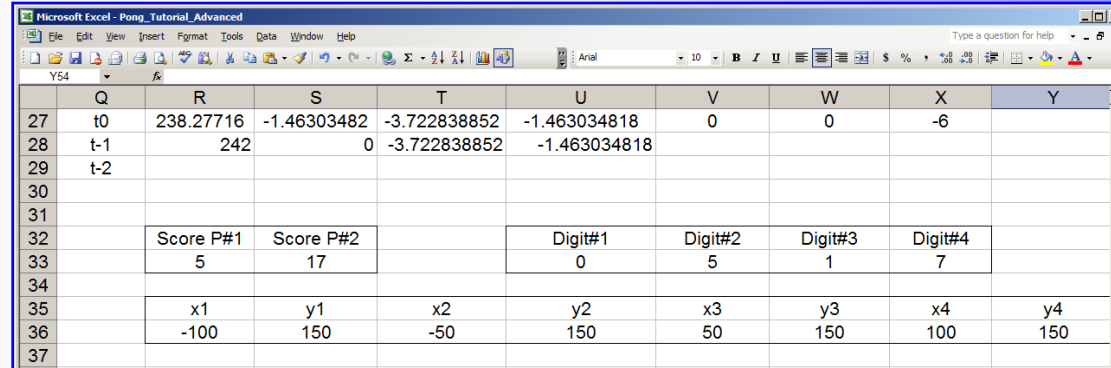
The screenshot shows a portion of an Excel spreadsheet with the following data:

	R	S	T	U	V	W	X
26	X_Ball	Y_Ball	Speed_X_ball	Speed_Y_ball	Y_Bat#1	Speed_Bat#1	Y_Bat#2
27	238.277161	-1.46303482	-3.722838852	-1.463034818	0	0	-6
28	242	0	-3.722838852	-1.463034818			
29							
30							
31							
32	Score P#1	Score P#2		Digit#1	Digit#2	Digit#3	Digit#4
33	5	17		0	5	1	7
34							
35							

Cell U33: `"=IF(R33>9,LEFT(R33,1),0)"`  
Cell V33: `"=RIGHT(R33,1)"`  
Cell W33: `"=IF(S33>9,LEFT(S33,1),0)"`  
Cell X33: `"=RIGHT(S33,1)"`

## 47. Create a digit position table

- There are a total of four score digits to be displayed, two for each player
- The digit position table (range R36:Y36) contains the position information (x and y coordinates) for these four digits
- These values are decided by taste and their values can be changed at any time function on where in the court we like the score to be displayed.



The screenshot shows a Microsoft Excel spreadsheet with the following data:

	Q	R	S	T	U	V	W	X	Y
27	t0	238.27716	-1.46303482	-3.722838852	-1.463034818	0	0	-6	
28	t-1	242	0	-3.722838852	-1.463034818				
29	t-2								
30									
31									
32		Score P#1	Score P#2		Digit#1	Digit#2	Digit#3	Digit#4	
33		5	17		0	5	1	7	
34									
35		x1	y1	x2	y2	x3	y3	x4	y4
36		-100	150	-50	150	50	150	100	150
37									

## 48. Expand the score digits into a sprite table

- Displaying a digit as a sprite works like a puppet show. The puppeteer stands behind a curtain and has ten puppets available. The ten puppets are the digits 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. Think the puppet show as a 2D coordinate show.
- While at any moment only one puppet is raised above the curtain (it has both x and y coordinate so that the puppet is visible). The rest of nine puppets have the same x coordinate identical to the x coordinate of the visible puppet but the y coordinate is large and negative (they are located at the feet of the puppeteer).
- If the data changes the puppeteer will put down the puppet in sight and will raise another puppet.



- We have four digits to display therefore we need four sprite tables, each one having two columns (for x and y coordinates) and ten rows (there are ten values for each digit: 0,1,2,3, ..., 9)

- In the table we can see that the x-coordinate of all the sprites corresponding to a certain digit are the x-coordinates of that digit.

- As Y-coordinate is concerned, we can also see that while 9 sprites are always held well below the visibility area (y=-999),

only one sprite is brought to the visible y-coordinate and that's the sprite corresponding to the actual digit value.

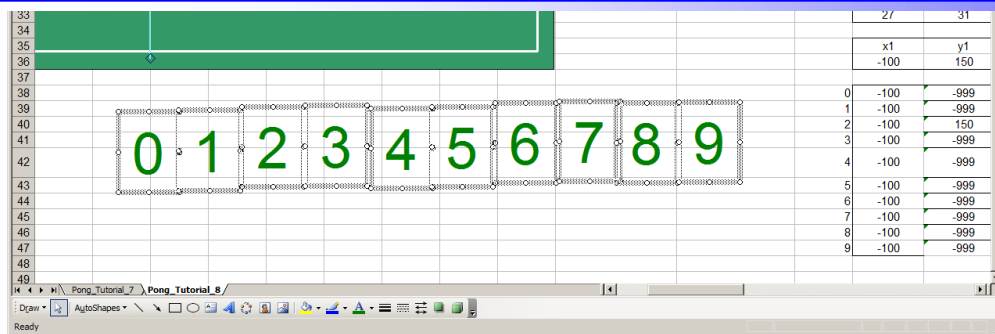
	Q	R	S	T	U	V	W	X	Y
31									
32		Score Player#1	Score Player#2		Digit#1	Digit#2	Digit#3	Digit#4	
33		27	31		2	7	3	1	
34									
35		x1	y1	x2	y2	x3	y3	x4	y4
36		-100	150	-50	150	50	150	100	150
37									
38	0	-100	-999	-50	-999	50	-999	100	-999
39	1	-100	-999	-50	-999	50	-999	100	-999
40	2	-100	150	-50	-999	50	-999	100	-999
41	3	-100	-999	-50	-999	50	150	100	-999
42	4	-100	-999	-50	-999	50	-999	100	-999
43	5	-100	-999	-50	-999	50	-999	100	-999
44	6	-100	-999	-50	-999	50	-999	100	-999
45	7	-100	-999	-50	150	50	-999	100	-999
46	8	-100	-999	-50	-999	50	-999	100	-999
47	9	-100	-999	-50	-999	50	-999	100	-999
48									

**Formulas used:**

- Range Q38:Q47 is just a series of increasing integers from 0 to 9. We need this to simplify the formulas used.
- Range R38:R47 all contains the x1 coordinate from the digit position table, range U38:U47 all contains the x2, range V38:V47 all contains the x3, and Range X38:X47 all contains the x4 from the digit position table.
- Cell S38: “=IF(U\$33=\$Q38,S\$36,-999)”, copy S38 down to S47
- Cell U38: “=IF(U\$33=\$Q38,U\$36,-999)”, copy U38 down to U47
- Cell W38: “=IF(W\$33=\$Q38,W\$36,-999)”, copy W38 down to W47
- Cell X38: “=IF(X\$33=\$Q38,X\$36,-999)”, copy X38 down to X47

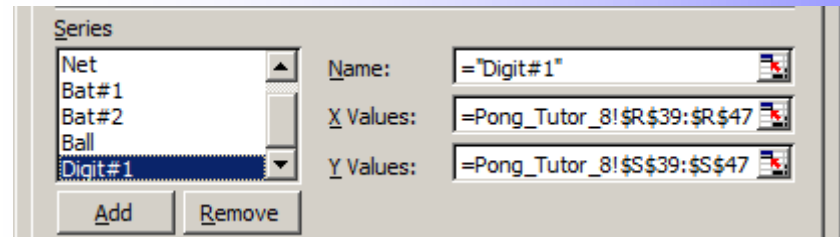
## 49. Create the sprites

- Use a textbox with a large font size to create a "0"
- Change the alignment to center/center
- Change the color to your preference
- Copy and paste the text box nine times
- Change the content of the new boxes to 1,2,3, ..., 9



## 50. Plot four new series on the pong court chart

- Series: Digit#1, range: R39:S47
- Series: Digit#1, range: T38:U47
- Series: Digit#1, range: V39:W47
- Series: Digit#1, range: X38:Y47



- Make sure to format the chart patterns for these four series so that they contain only markers but no line

## 51. Paste the digit sprites onto the chart markers

- Type a zero in each of the cells R33 and S33
- Select sprite "0" => Shift => Edit => Copy Picture => As shown on screen => OK
- There are two new markers on the screen from Digit#2 and Digit #4, click on the first marker (the left one)
- Wait for 1-2 seconds than click again. You will see that the cursor changes into a cross => Edit => Paste
- Click the second marker (the right one), wait for 1-2 seconds than click again. You will see that the cursor changes into a cross => Edit => Paste

- Type the number "11" in each of the cells R33 and S33
- Select sprite "1" => Shift => Edit => Copy Picture => As shown on screen => OK
- There are four markers on the screen from Digit#1 Digit#2, Digit#3 and Digit #4, click on the first marker (the left one), wait for 1-2 seconds than click again. You see that the cursor changing into a cross => Edit => Paste
- Click the second marker (the right one), wait for 1-2 seconds than click again. You will see that the cursor changes into a cross => Edit => Paste
- Repeat for the above paste operations for next two markers
- Type the number "22" in cells R33 and S33
- Select sprite "2" => Shift => Edit => Copy Picture => As shown on screen => OK
- There are four markers on the screen from Digit#1 Digit#2, Digit#3 and Digit #4, click on the first marker (the left one), wait for 1-2 seconds than click again. You see that the cursor changing into a cross => Edit => Paste
- Click the second marker (the right one), wait for 1-2 seconds than click again. You will see that the cursor changes into a cross => Edit => Paste
- Repeat for the above paste operations for next two markers

## 52. Finish displaying all the sprites and verify the functionality of the score display

Repeat the above series of operations for all the sprites up to sprite "9". Now the display is ready to use. To test the display go and plug in different numbers between 0 and 99 in either of the cells R33 and S33. Visually verify that what you placed in both cells is being displayed on the upper part of the chart. You can also adjust the position of the displayed score to your taste. The next tutorial will explain the macros used to drive the score logic.