

Excel PONG Tutorial #2

by George Lungu

- creating the pong bat animation with various options

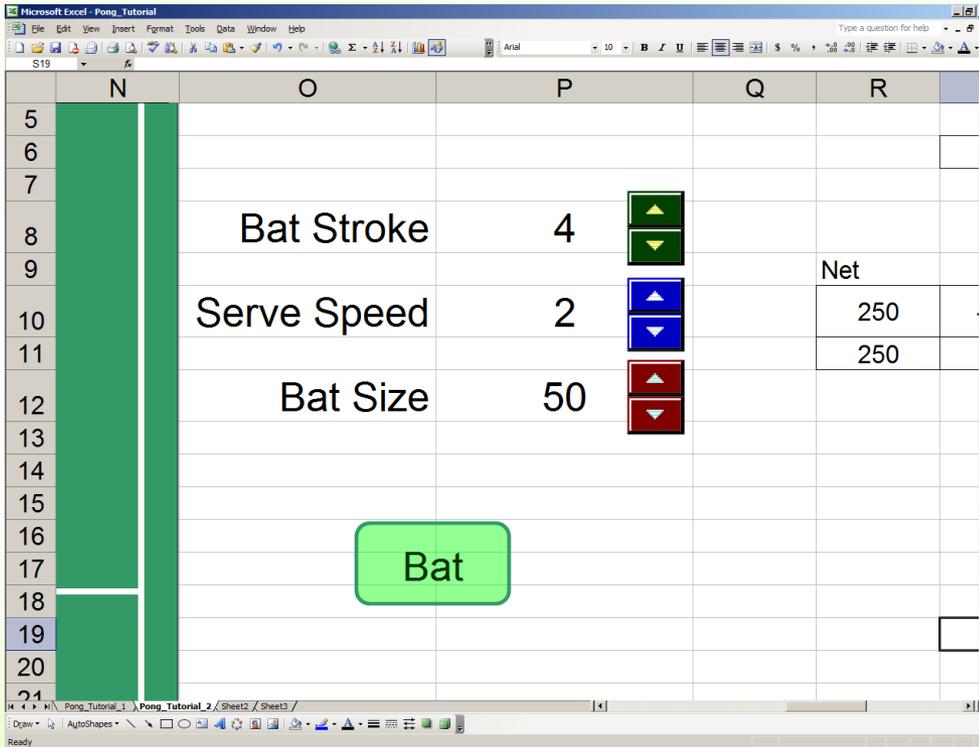
-In this tutorial (which is a continuation of part#1) two bat input parameters are added to the model: bat size and bat stroke.

- Two bats will be created and added to the chart, the opponent's bat (bat #1) and the player's (bat#2). For now, whereas the player's bat will be able to move with the mouse, the opponent's bat will be fixed in place.

- While horizontally the bats are fixed, an extra condition will be added so that the bats are vertically restricted to the tennis court (or table)

11. Add three input parameter buttons and VBA macros:

- Copy and paste the worksheet. Rename the new worksheet "Pong_Tutorial_2".
- Write the following worksheet macros and add the following spin buttons:
 - => **Bat_Stroke** with a range of [1,10]
 - => **Serve_Speed** with a range of [1,20]
 - => **Bat_Size** with a range[0,5]



```
Sub Bat_Stroke_Change()
```

```
[P8] = Bat_Stroke.Value
```

```
End Sub
```

```
Private Sub Serve_Speed_Change()
```

```
[P10] = Serve_Speed.Value
```

```
End Sub
```

```
Private Sub Bat_Size_Change()
```

```
Dim BArr As Variant
```

```
BArr = Array(2, 5, 10, 15, 20, 40)
```

```
[P12] = 10 * BArr(Bat_Size.Value)
```

```
End Sub
```

- Don't forget to write the parameter labels like in the snapshot above

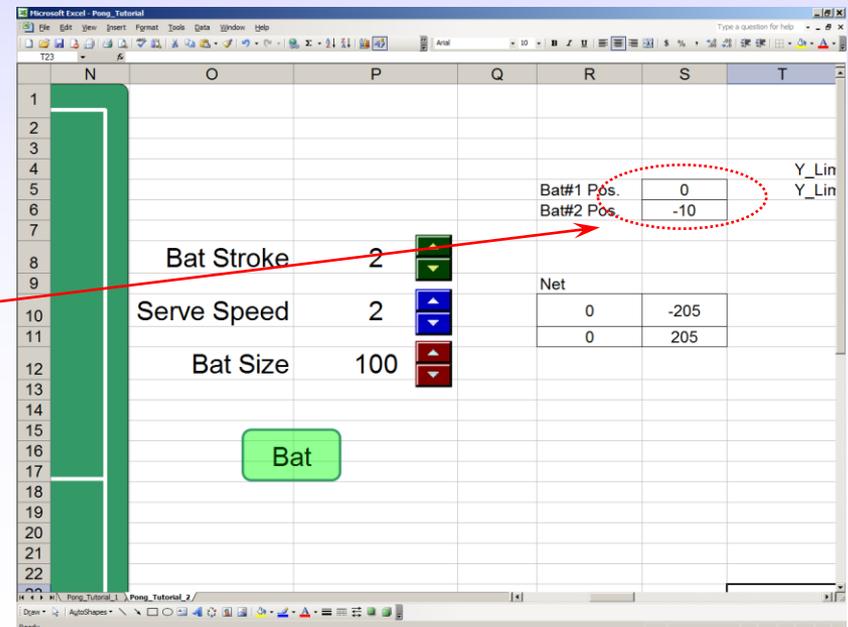
12. Upgrade the bat macro (add stroke scaling):

- Firstly, copy the “Bat_Tutorial_1” macro and rename the copy “Bat_Tutorial_2”. In the new macro, the relative mouse position pasted in cell S6 is the old value multiplied by the bat stroke. The old value (produced by the old Bat macro) was the difference between the number of display rows of the spot the mouse was clicked at the start of the macro (somewhere on top of the “Bat” button) and the number of display rows corresponding to the current position of the mouse.
- This will scale the bat stroke by a number between 1 and 10 and allow the player to choose a stroke adequate to his or her own playing style.

```
Sub Bat_Tutorial_2()  
Dim Pt0 As POINTAPI  
Dim Pt1 As POINTAPI  
RunPause = Not RunPause  
GetCursorPos Pt0  
Do While RunPause = True  
DoEvents  
GetCursorPos Pt1  
[S6] = [P8] * (-Pt1.Y + Pt0.Y)  
Loop  
End Sub
```

13. Allocate a cell with the opponent's bat position information:

- We already used cell S6 for the player's bat coordinate (bat #2).
- Allocate cell S5 for the opponent's bat position information (fill it out with a zero for now).
- Use range R5:R6 to label the bat coordinate information.



14. Create court-limited bat coordinates:

- Both bats' vertical positions are measured from the horizontal median line of the court (ping pong table).
- The limited coordinate calculations will limit the bat movements so that no bat part can exceed the limit of the court. The formulas will limit the maximum bat coordinate to the half the width of the court minus half the bat size. Similarly the minimum bat coordinate will be limited to minus half the width of the court width plus half of the bat size.

	Q	R	S	T	U	V	W
1							
2							
3							
4					Y_Limited_Bat#1_Position	0	A
5		Bat#1 Pos.	0		Y_Limited_Bat#2_Position	-10	B
6		Bat#2 Pos.	-10				C
7					Court dimensions:		D
8					Players_in	40	E
9		Net			Length	600	A
10		0	-205		Width	400	F
11		0	205		Ball_Radius	18	

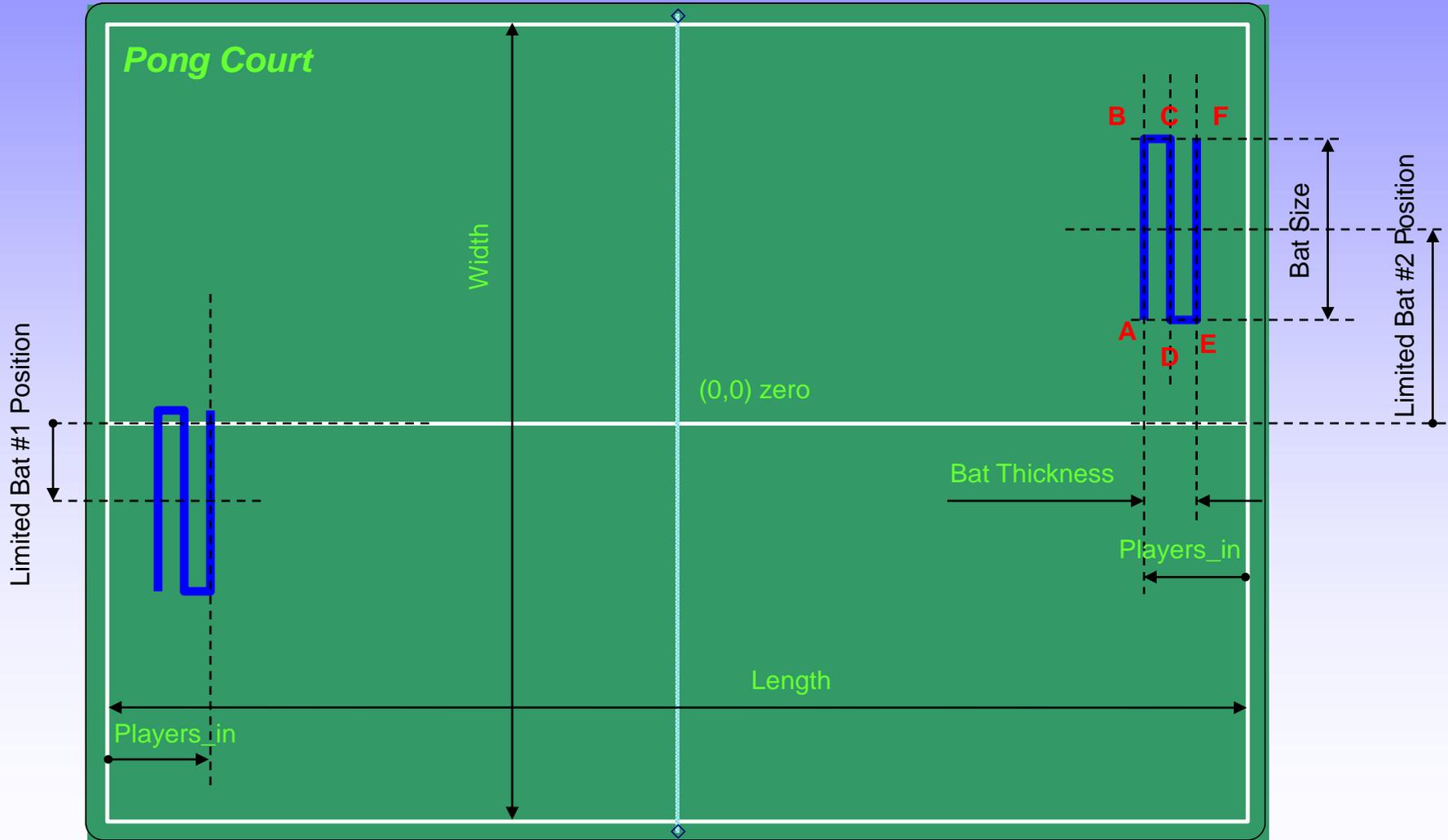
```
U4: "=SIGN(S5)*MIN(ABS(S5),(V$10-P$12)/2)"
U5: "=SIGN(S6)*MIN(ABS(S6),(V$10-P$12)/2)"
```

15. Create the bat geometry tables:

- Cell Y12 will contain the bat thickness (chosen to 2.5 by trial and error – you can change it later).
- The bats are built like snakes (see next page) since we like our bats to be about three times larger than the maximum thickness of the line allowed on an Excel chart.
- More details about the way the bats are build are on the next page.

	T	U	V	W	X	Y	Z
1							
2							
3							
4		Y_Limited_Bat#1_Position	0	A	PingPong Table Geometry:		
5		Y_Limited_Bat#2_Position	-10	B	-300	0	
6				C	-300	200	
7				D	300	200	
8				E	300	-200	
9		Court dimensions:					
10		Players_in	40	E	-300	-200	
11		Length	600	A	-300	0	
12		Width	400	F	300	0	
13		Ball_Radius	18				
14					Bat Thickness	2.5	
15				Bat #1 - geometry:		Bat #2 - geometry:	
16				-260	-50	260	-60
17				-260	50	260	40
18				-261.25	50	258.75	40
19				-261.25	-50	258.75	-60
20				-262.5	-50	257.5	-60
21				-262.5	50	257.5	40

How the bats are defined:



- After the bats are charted on the same chart with the court using the thickest line, the bat thickness must be increased as much as possible as to keep the block appearance (the snake gaps must be filled).

16. Chart the bats on the "Court" chart:

- Add two new series on the chart and name them "Bat#1" and "Bat#2"
- Use the data from "Bat#1_Geometry" and "Bat#2_Geometry" tables of data respectively
- After adding the series double click on them one by one and do the following operations:
 - => increase the line weight to maximum
 - => change the color to your preference
- After you finish, run the "Bat" macro and while the macro is running, play with the bat settings and observe their effects.

