Math 211 – Numerical Analysis I
Winter Term 2018
Assignment 3
Due Date: Thursday 5 April 2018

In this assignment, you will experience how a car designer uses the cubic Bezier curve to design cars.

On a graph paper, draw the x and y axes. Pinpoint the coordinates $P_0(0,0)$, $P_1(4,4)$ and $P_2(8,0)$ on your graph paper.

We want to define a cubic Bezier curve from P_0 to P_1 and another cubic Bezier curve from P_1 to P_2. In particular, we want the two curves to join with tangential continuity at P_1, i.e. we want the curves to join smoothly at P_1.

Pinpoint the inner Bezier control points to achieve smoothness at P_1. In this assignment, you have the freedom to choose where you wish to put the points provided the curves join smoothly.

Then, for the first curve from P_0 to P_1, calculate the *x* and *y* coordinates for $t = 0.0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9\ and\ 1.0$. Pinpoint these points on your graph paper. Then, draw a curve that connects all these points.

Do the same for the second curve from P_1 to P_2.

In your presentation, you should calculate your points in a table as follows:

First curve			Second curve		
t	*x*	*y*	*t*	*x*	*y*
0			0		
0.1			0.1		
0.2			0.2		
0.3			0.3		
0.4			0.4		
0.5			0.5		
0.6			0.6		
0.7			0.7		
0.8			0.8		
0.9			0.9		
1			1		

Attach this table together with your graph. This is supposed to be a fun-filled assignment. I hope you can be creative and have fun completing it.

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