CS552: Computer Graphics
Home Assignment (Curve representation)

1. Given knot sequences $U1 = 0, 0, 1, 1$ and $U2 = 0, 0, 0, 1, 1, 1$, use hand calculation to verify that the B-spline basis functions on $U1$ and $U2$ are identical to the Bézier basis functions.

2. Show that the maximum of the Bernstien Basis $B_i^n(t)$ occurs at $t = i/n$.

3. The discussion of joining two Bézier curves with C^1-continuity assumes the domain of the curves is $[0, 1]$. Suppose the domain of the first curve is $[0, s]$ and the domain of the second curve is $[s, 1]$. Redo the calculation. What is your conclusion? Is there any modification required?

4. Given three control points on the xy-plane $(-1, 0)$, $(0, 1)$ and $(2, 0)$; find points on the Bézier curve that correspond to $t = 0, 0.25, 0.5, 0.75$ and 1 with the conventional form.