CS 779, Winter 2020
Assignment 1

1. (5 pts) Show that the degree n Bernstein polynomials form a basis for the space of degree n polynomials.

2. (5 pts) Show that the Bernstein polynomial $B_i^n(t)$ obtains its maximum over $[0, 1]$ at $t = i/n$. Find the maximum value.

3. (20 pts) Implement an interactive 2D Bézier curve editor with the following functionality:

   - The left mouse button adds a new control point.
   - The middle mouse button is used to move control points.
   - There are two display modes (accessible through a menu):
     - Just the curve.
     - The curve and the control polygon with labeled control points.
   - There should be a reset key/menu-option that clears all the control points.

   If n control point have been entered, then draw a degree $n-1$ Bézier curve. This curve should be updated in real time when a control point is moved with the middle mouse button.

   You should submit a short write-up telling me where the executable is, how to run and operate it, and what functionality you implemented. You do not need to submit any code, although possibly emailing me a zip file or tar file is the simplest way to submit it.