* Overview:

For this project, I was tasked with implementing the de Casteljau algorithm to draw Bézier curves using control points. The main objective was to modify the given code to render the Bézier curve in green color instead of the provided red color. The implementation involved making changes to the "bezier" and "recursive\_bezier" functions in the main.cpp file. The "bezier" function was responsible for rendering the Bézier curve using a list of control points and an object of OpenCV::Mat, while the "recursive\_bezier" function utilized the de Casteljau algorithm to calculate the corresponding coordinates on the Bézier curve based on the control points and a floating-point parameter "t".

* Algorithm:

The de Casteljau algorithm for generating Bézier curves can be summarized as follows:

* Begin with a list of control points p0, p1, ..., pn that define the Bézier curve.
* Connect these control points to form line segments.
* Subdivide each line segment using a ratio of t : (1-t) and find the split point.
* Use the obtained split point as the new control point list, reducing its length by one.
* If the list contains only one point, return that point and terminate. Otherwise, go back to step 1 using the new control point list.
* By executing the algorithm with different values of "t" in the range [0, 1], we can obtain the corresponding Bézier curve.

One difficulty I encountered was understanding the recursive nature of the de Casteljau algorithm and its connection to the control points and parameter "t". It took some time to grasp how each recursive step subdivides the line segments and influences the shape of the resulting Bézier curve. However, by carefully analyzing the algorithm and experimenting with different control points and values of "t", I was able to overcome this difficulty and achieve the desired results.

Another challenge was modifying the given code to render the Bézier curve in green color. Understanding the code structure and identifying the specific functions and variables to modify required careful analysis. However, by following the provided instructions and leveraging my knowledge of computer graphics, I successfully implemented the required changes and rendered the Bézier curve in the desired color.

A screenshot of a computer

Description automatically generated with medium confidence