CSE 333/533 - Monsoon 2022
Assignment 1: Shape representation
Due date: 23:59, 14 Sep. 2022

The given program renders a cube that you can rotate with the mouse. Compile and run it (from the root folder of code).

Study the program and understand how the cube is created and rendered. Notice how the function `createCubeObject()` creates an array of triangle vertices for rendering with OpenGL.

Shape representation

1. Create a surface using its parametric equation (you may refer to links below). Vary the two parameters and generate a series of triangles. Write your code inside the `createParametricObject()` function in main.cpp.
   [Functionality: 25 marks, Code quality and documentation: 5 marks]
2. Piecewise Bezier curves can be used to design interpolating curves. Given a set of *n* points in a plane, suggest a strategy to design an interpolating piecewise cubic Bezier curve that is C^1 overall. Write pseudocode for your design. Additionally, use drawings to support your strategy.
   [Correctness: 10 marks, strategy: 10 marks]

Deliverables (as a single zipped file **Assignment01_<studentID>.zip**) containing:

- C/C++ code (make sure to upload full code and do not include any intermediate object files, delete any other temporary files).
- 2~4 page PDF Report written with with **Latex/MS Word**. Use the acmlarge option (single column) (see sample-acmlarge.tex if writing with Latex). Include screenshots within the report itself (and DO NOT attach separately).

Total marks for this assignment: 50 marks

Reference parametric surfaces:

http://www.scientificlib.com/en/Mathematics/Surfaces/ParametricSurfacesGallery.html
https://davidmathlogic.com/amit/parametricsurfacegallery.html
https://legacy-www.math.harvard.edu/archive/21a_fall_06/handouts/parametric.pdf
http://www.melikamp.com/math/teaching/calculus/parametric-surfaces.html

Note: Your code should be written by you and be easy to read. You are NOT permitted to use any code that is not written by you. (Any code provided by the instructor/TA can be used with proper credits within your program). Theory questions need to be answered by you and not copied from other sources.