CMPS385: Assignment 7

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Run Instructions

```
$ make
$ ./main
```

Changes Overview

Part 1

Task 1

- We read the cube.mesh and converted the quads to triangles by dividing each quad into 2 trianle in *getVertices()*
- We added the cube to the scenegraph

Task 2

- We recaluclated new normals at the vertices by adding to each vertex's normal the face normal then we divided by 2.

Task 3

- Added a sin function that animates the cube using a GLUT timer. The sin function consider the vertex and the time on order not to have a zoom in zoom out effect.

Part 2:

Task 1

- We copied the snippets into the project and it ran without any errors.
- We implemented *updateShellGeometry()* to render the hair on every vertex.
- We implemented initial version of function *updateShellGeometry()* that uses *VertexPNX* to assign the required textures

Task 2

- We implemented *hairsSimulationCallback()* that updates *g tipPos* and *g tipVelocity*
- We added a new global bool *gShellNeedsUpdate* in order to avoid updating the shells when not needed.

Task 3

- We updated *updateShellGeometry()* to show the hair curve based on the figure in the assignment.
- We added a new data structure, an array of Cvec3 vectors *gcalculatedShellVertices* in order to keep all calculated points on each shell.

Difficulties/Assumptions:

- In Part 1, task 2: We divided by 2 instead of calculating the valency at each vertex.
- In Part 2, task 3: We derived d and got *((t - p - n * gnumShells) / (gnumShells))* The hairs were rendering too long so we minimized it to become *((t - p - n * gnumShells) / (gnumShells * gnumShells/2))*
- We used make OPT=1 since the code was running very slow without it.