CS5820: Graphical Processing Unit
HW: Assignment 0

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Problem Statement:
Write pseudocode for a geometry shader, that creates a ripple effect starting with a point at the center. You can use vertex and pixel shaders, in addition to the geometry shader. Use only if required.

Visualisation:
Ripple effect from the center can be visualised as moving circles along z axis.
The equation of circle can be expressed as

$$x^2 + y^2 = c^2$$

As per considered visualisation, we can depict

$$z^2 = x^2 + y^2$$
$$z = \sqrt{x^2 + y^2}$$

Pseudo code:

```
uniform float time;   // for repeating pulse
int main(){
  position = gl_in[0].gl_Position;
  vec3 transformed = vec3(position);
  float dx = position.x;
  float dy = position.y;
  float z = sqrt(dx*dx + dy*dy);
  float k = 6.0;    // wave number of ripple wave
  float w = 10.0;   // angular frequency of ripple wave
  float A = 0.2;    // amplitude of the ripple wave
  transformed.z += A*sin(wt - kz); // transformed z

  // Fixing Normals
  objectNormal = normalize(vec3(0.0,-A *z*cos(wt-kz),1.0));
  vertexNormal = normalMatrix * objectNormal;
}
```