**Introduction**

Large memory consumption of terrain input is usually the performance bottleneck for terrain rendering. With hardware tessellation feature, we can generate terrain details without sacrificing performance by: 1) leveraging tessellator to generate more primitives on the GPU; 2) adaptively generating details to avoid over/under tessellation based on screen space edge length and camera distance; 3) using noise map to add more details in evaluation shader; 4) perform frustum cull in tessellation control shader so that primitives outside of frustum are not sent down to the later pipeline stages.

**Running the sample**

 key 'w' to toggle wireframe mode. Red lines indicate input terrain grid. White lines show the tessellated grid.

 key 's' to toggle between Phong Tessellation and Flat Tessellation

 key 'n' to toggle noise effect

 navigate terrain using first person camera by up, down, left and right arrow keys.