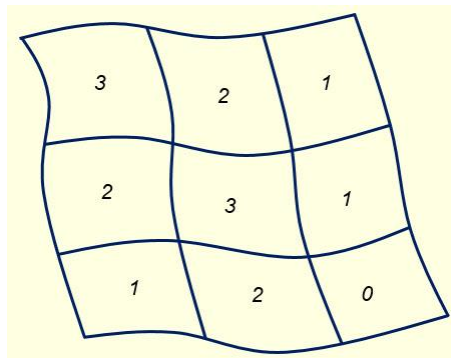


**CS633 3D Computer Animation**  
**Homework Assignment 7 (40 points)**  
**Due: 5/1/2018**

1. Given the following control mesh of a Catmull-Clark subdivision surface, the number within each mesh face is the subdivision depth for that mesh face computed using some subdivision depth computation software. Perform adaptive subdivision on the control mesh (see slides 39-45 of the notes: "Special Models for Animation III") so that the conformity requirement is satisfied (i.e., adjacent mesh faces share the same vertices on their shared edge) (10 points)



2. On slide 14 of the notes: "Physically Based Animation I", the Midpoint Method is introduced as an option to improve the performance of the standard Euler Method (slide 11) when we try to get an estimate for the value of  $X(t + \Delta t)$ . Why? Justify your answer. (10 points)
3. A typical particle system's updating loop can be separated into two stages: simulation stage and rendering stage. What would usually be done in the simulation stage and which part is the most critical part of the simulation stage? (10 points)
4. Particle systems can be either animated or static. Please tell in the following cases, which are animated and which are static, or mixed. (10 points)

