Mesh Parameterization and Sphere Generation

a) **Disk Topology: 40 points** You will implement disk parameterization to flatten the surface meshes as shown below. Use uniform, harmonic, and mean-value weights to obtain 3 different flattenings per mesh. You simply need to map the boundary vertices to a disk and then map the others in such a way that each vertex is in the center (uniform) or weighted center (harmonic and mean-value) of its 1-ring neighborhood. Please check the Mesh Parameterization lecture slides in order to get all you need for this implementation.

b) **Sphere Topology: 20 + 20 points** Some of the meshes in the input folder have sphere topology. Use the Method # 5 in the Parameterization slides to parameterize them onto unit sphere. As a second solution, define a cut/seam path along the surface and duplicate the path vertices to obtain disk topology (see lecture slides). Now perform the flattening you implemented in part a).

c) **Sphere Generation: 20 points** Implement the Sphere Generation Method # 2 with a tetrahedron start (see lecture slides). Define a cut/seam from one pole to the other and cut it open as you do in part b).

Submission This assignment constitutes 20% of your final grade. Use the meshes provided in ∼ys/meshes2.zip. Send to ys@ceng.metu.edu.tr your code, executable, output screenshots, and mynotes.txt file where you mention the encountered problems and interesting observations.