CS130 Winter 2013 Midterm 2 Study Topics

1. Texture Mapping
   (a) Coordinate Systems
   (b) Intermediate Surfaces
   (c) spherical, cylindrical, box mappings
   (d) mapping from actual shape to intermediate shape (position, surface normal, centroid)
   (e) Parametric surfaces
   (f) Triangle texturing
   (g) Multitexturing
   (h) Aliasing, Magnification, Minification
   (i) Mipmapping
   (j) filtering, point sampling
   (k) Perspective correct interpolation
   (l) Environment mapping
   (m) Shadow mapping, bump mapping, normal mapping
2. Rotations
   (a) rotation about arbitrary axis
   (b) composite transformations
   (c) Euler Angles
   (d) Gimbal Lock, extrinsic & intrinsic rotations
   (e) Quaternions
   (f) Slerp
3. Animation
   (a) Keyframing
   (b) Kinematics - forward vs. inverse.
   (c) Skinning
   (d) Physics-based & deformable object simulation

4. Raytracing
    (a) basic algorithm components: cast, intersect, shade, recursion
    (b) Anti-aliasing raytracing techniques
    (c) soft shadows
    (d) soft focus
    (e) soft reflections
    (f) motion blur
    (g) acceleration structures: bounding boxes, spatial partitioning, bounding volume hierarchy
5. Curves
    (a) goals: local control, smoothness & continuity, derivative evaluation, stability, ease
    (b) Parametric curves, tangent vector to
    (c) Reparameterization
    (d) Piecewise curves
    (e) continuity C^0, C^1, .. C^n, G^1
    (f) higher order polynomial interpolation: overshoots & non-local effects
    (g) Blending functions
    (h) Cubics
    (i) Cubic Hermite Curves. blending
    (j) Bezier Curves, blending, subdivision
    (k) Parametric surfaces, tangent plane to
    (l) Bezier surface patches