Assignment 2

- Create an articulated mannequin
- Has body, head
- Two arms with elbow joint
- Hand
Some basic 3D setup commands

- `glFrustum(Left, Right, Bottom, Top, Near, Far);`
- float `light_position[] = {-10.0, 20.0, 20.0, 1.0};`
- `glLightfv(GL_LIGHT0, GL_POSITION, light_position);`
- `glEnable(GL_COLOR_MATERIAL);`  
  - This allows you to color basic glut objects (sphere, cube)
- `glEnable(GL_LIGHTING);`
- `glEnable(GL_NORMALIZE);`  
  - This enables you to scale a cube without messing up lighting
  - Why?
- `glutSolid Sphere(rad, lat, lon);`
- `glutSolidCube(size);`
GL_PROJECTION

- GL_PROJECTION
- GL_MODELVIEW
- $M \leftarrow P \ M_v$
- The only difference between Projection (P) and Modelview (Mv) is that you cannot pop P off the stack, and
- P is always applied.

- A RIGHT HANDED COORDINATE SYSTEM
Order of rotations

- To rotate around an arbitrary point on an object and not have it move.
- Must translate to the center of rotation, rotate, translate back again. (Beware of scales)

- All rotations occur in your initial frame of reference
- + looking a positive direction along an axis.

- Exercise
Use of Matrix Stack.

- **Push**
  - Rotate Torso
  - Draw Torso
  - Push
    - Translate, Rotate and draw Right arm
    - + Deal with forearm and hand (more pushes and pops)
  - Pop
  - Push
    - Translate, Rotate and draw Right arm
    - +Deal with forearm and hand
  - Pop
- Pop