Indicative marking guide

The list below aims to provide an indication of the features required to achieve a mark within each marking boundary. The final grade awarded will depend upon the exact combination of features and how well they have been implemented. If you skip some features in the lower bands, but implement others in higher bands, marking will take the overall achievement profile into account. If you want to be *certain* of achieving a grade within a particular band, the safest thing to do is to implement all the features in the preceding bands !

Remember that you will only receive full credit for features that *you yourself* have written. Any code that has been derived from existing materials (either manually or by AI code generation tools) may be partially or even fully discounted.

In order to gain a "bare pass" mark of 40 you must *convincingly* implement ALL of the following features:

- OBJ geometry and material file loading
- Wireframe 3D scene rendering
- Flat colour 3D scene rasterising
- Keyboard control of camera position

For a mark in the 40s you must *convincingly* implement all above features, as well as some of the following:

- Frame saving and video compositing (i.e. not using screen capture !)
- Scene contains more than one model (i.e. not just Cornell box)
- Use of depth buffer to resolve occlusion
- Keyboard control of camera orientation (using orientation matrix)

For a mark in the 50s you must *convincingly* implement all above features, as well as some of the following:

- Hard Shadow (without soft edges) plus ambient lighting
- Some form of surface texture mapping (in either rasteriser or ray tracer)
- Diffuse lighting (proximity and angle-of-incidence)
- Simple animation (e.g. orbit, lookAt, fly-through, tracking/panning, simple transformation of model elements etc.)

For a mark in the 60s you must *convincingly* implement all above features, as well as some of the following:

- Gouraud shading
- Rough attempt at soft shadows (using multi-point light sources)
- Mirrored surfaces
- Specular lighting (must be a clearly visible specular "spot")

For a mark in the low 70s you must *convincingly* implement all above features, as well as some of the following:

- Phong Shading
- Smooth and elegant soft shadows
- Refractive materials (e.g. glass, water etc.)
- Complex animation (e.g. complex camera movement, physics simulation, rigging/articulation etc.)

To get above 75% you must *convincingly* implement all above features, as well as some of the following:

- Environment maps (used with reflective surfaces)
- Metallic surfaces (various different metals)
- Depth-of-field (with Bokeh)
- Photon maps and caustics