COSC 4P98 Lecture notes: **Ray Tracer**
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Ray Tracer Pseudo-code (based on [Watt & Watt])

```
Colourtype RayTrace( rvec, rec_depth)
    If (rec_depth > MAX_DEPTH)
        Colour = background_colour
    Else {
        If RayIntersection (rvec, hitobj, hitpt, hitnorm) {
            local_colour = shade(hitobj, hitpt, hitnorm)
            If has_refl(hitobj) {
                refl_vec = calc_reflection(rvec, hitobj, hitpt, hitnorm);
                reflect_colour = RayTrace((hitpt, refl_vec), rec_depth+1)
            } // if
            If has_trans(hitobj) {
                trans_vec = calc_transmission(rvec, hitobj, hitpt, hitnorm)
                trans_colour = RayTrace((hitpt, trans_vec), rec_depth+1)
            } // if
            colour = local_colour + reflect_colour + trans_colour
        } // if
        Else
            colour = background_colour
    } // else
    return ( colour )
} // program
```

- Assumes list of objects in scene:
    - type of object (plane, sphere)
    - location, orientation (possibly transformations)
    - material: diffuse, specular, ambient properties (per R, G, B channel)
    - reflection coefficient (0-1)
    - transmission (refraction) index
    - texture
    - etc
- Also list of lights

- reflection vector may have been computed in specular computation (“shade”) if specular was used there. Can save computing this vector twice!
- Can replace colour addition with more sophisticated mixing (eg. normalize colours)