# Maths and Tech assignment

Describe generally the use of post-processing in a graphics application

Postprocessing is used in the films and games industry to manipulate images giving them specific effects. For example, games have used this effect to show water running down a window.

On screen effects can be achieved like rain running down window. Which helps immerse the user.

Explain the specific techniques used for your post-processing effects

Texture passing

Displacement mapping

* + Discuss improvements or extensions you could make.

To create a post process effect, you must render scene to a texture then send that texture through multiple passes of different postprocess shaders to give the texture different effects. but in many cases the effects are not worth it or complicated effects create performance issues. For example, bloom requires 4 passes of the scene texture to create the effect but a less expensive way to create bloom would be to create a bloom map by using a glossiness map this would be a way of faking. The advantage of this would be performance the trade-off is a lower quality effect but most users will not notice the difference.

Gaussian blur can be improved by using linear sampling instead of point sampling. Linear sampling will grab a collection of pixels from a texture instead of one pixel therefore the process is able to blur multiple pixels every iteration resulting in a stronger blur. This method is only beneficial if the blur is being run multiple times.

Gaussian blur can be improved by using a 9 tap version which uses different sampling to grab more pixels therefore blur will require less passes.

<https://community.arm.com/developer/tools-software/graphics/b/blog/posts/post-processing-effects-on-mobile-optimization-and-alternatives>

* Basic Requirements
* Advanced Requirements
* Additional Features
  + Distance sorting for post processes
  + Light Beams (God rays attempt)
  + Gaussian Blur with weight adjustment
  + Tv Object with portal implementation and alpha cut out also has post process capabilities
  + Camera picking
  + Imgui