The texture loading led to massive memory usage for a scene with many instances. When testing with over 100 “soul spears”, the memory usage would reach upwards of 11gb and start times over 1 minute. In order to fix this, I implemented a texture “cache” which will store any previously loaded textures as pointers in a static list in the mesh class. There is a cache for the diffuse, specular, and bump maps. When a future object tries loading a texture with the same filename, it will instead grab the same texture pointer and use that instead. On **my system**, it led to the following results:

Loading 100 “soul spears” with diffuse, specular, and bump maps on start up

Without cache:

* 11.2GB memory usage
* Around 1 minute start up time.

With cache:

* 519mb (A 96% decrease)
* Around 21 second program start time (A 65% decrease)

Results obviously vary depending on the system and the current active process on the system, however there is a notable decrease between both tests on the same system, in the same conditions.