**Background:**

ICT312 Virtual Simulations project titled “Tavern Simulation” was a 4 person group project consisting of two major components. The physics and AI. The physics required us to simulate post collision effects on multiple objects when they collide to learn how to implement different physics-based formulas and also promote realism within the virtual world.

The AI component also promotes realism, but most importantly the internal model and techniques used to implement a living breathing agent is most important. This was done by combining needs based AI with affordances, moods, emotions and traits to make the NPCs be driven not only by needs, but also affected by their other facets of the human personality while enabling them to make decisions on things that provide them the most placation for their needs.

**Features:**

Animated agents

Agents with traits, needs, moods, emotions

3 different types of NPCs with unique behaviors

Interactive objects that can be picked up

Physics collision resolution

Compound collision objects

Interactive NPCs

**Members:**

Ary Bizar

Bryan Yu

Samuel Steere

Alexander Arif

**Responsibilities:**

Large fraction of the physics engine – calculating inertia tensor for simple and compound collision shapes, collision penetration resolution

Object picking/selection mechanism

Player to agent interaction

Data structures for agent traits, personality and needs

Wrapping up and extending functionality of existing math classes – Quaternions and Matrices

**Tools Used For Developing the Project**:

Bullet Physics (only collision detection and collision shapes, any physics resolution component is stripped away and replaced with our own)

Microsoft Visual Studio 2010

C++

Git using gitbucket

OGRE (object oriended graphics rendering engine)

OIS input system (packaged with ogre)

Boost library

3DS Max