BASIC RAYCAST

Exercise Files

Starter – "Kit/gpgt/server/scripts/gpgt/chapter9/exercise_001.cs"
Answers – "Kit/gpgt/server/scripts/gpgt/chapter9/answers/exercise_001_f.cs"

Exercise Mission

Chapter 9: "001_ContainerRaycasting: Basic Ray Cast"

Synopsis

In this exercise, we will write a concrete example of raycasting code and complete the implementation of some sample code that provides feedback when a ray intersects an object.

Prerequisites

1. *ch1_001.pdf "Using The Kit"*

Exercises

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1 Casting a Ray

Goal: It is your task in this section of the exercise to write some basic raycasting code and to extract the ID of any object that is struck by this ray (if any).

Starter Code: This example comes with a significant amount of code. This code will build a circular ring (like in the AI exercises) and then places a box in the middle of this ring.

Once the ring and box are in place, the code will start cycling, selecting a single marker (on the ring) as a starting position, and another marker (again on the ring) as an ending position.

The idea is that we should cast a ray between these two positions. That is, the "%fromMarker" and "%endMarker" objects are used to supply the starting and ending points on our ray (respectively).

You should feel free to inspect this code at your leisure (later), but for now please focus on the code between the markers "EXERCISE BEGINS HERE" and "EXERCISE ENDS HERE".

```
// EXERCISE BEGINS HERE

// 1
//%startPos =  %fromMarker.?????
//%endPos   =  %toMarker.?????

// 2
//%hitObject = ?????

// EXERCISE ENDS HERE
```

Steps:

1. Please uncomment the lines marked by "//1" and complete the code such that "%startPos" and "%endPos" contain appropriate starting and ending points for our ray (respectively).
2. Please uncomment the lines marked by "//2" and complete the code such that the engine casts a ray between our starting and ending points and the ray strikes any object between those two points. The ID of any object struck by this ray should be returned and stored in "%hitObject".

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Output Goal:

When you are comfortable that you have made the appropriate changes to the starter code, please run the mission associated with this exercise. Once the mission loads, switch to free camera mode (ALT+C) and zoom out a bit. You should observe that there is a box in the center of a ring (see figure 1 below).

The markers on this ring are colored blue (unselected marker), green (starting marker), and red (ending marker). Furthermore, the marker that is red will change over time, rotating the ending marker (for the ray cast) around the ring.

Finally, if your code is in fact correctly implemented, you will notice that the box in the center of the screen will turn green every time a ray intersects it (see figure 2 below).

Please note, the white arrow in the illustrations (below) will not be rendered in your example. I added this with a 2D art program.

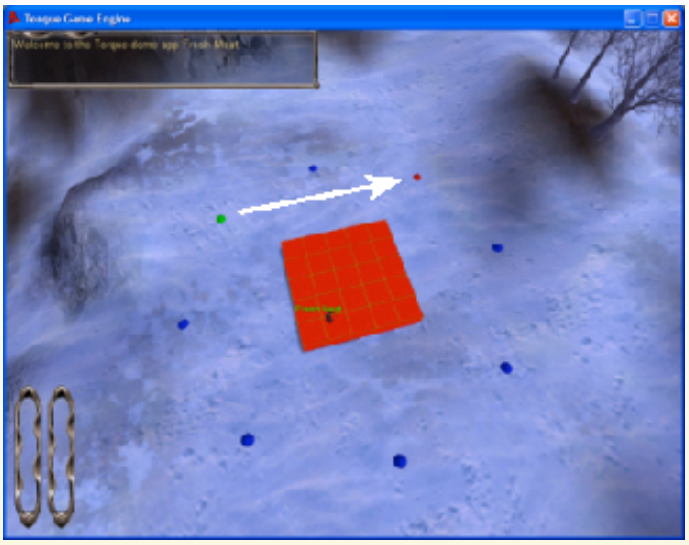

Figure 1. Ring and Box (No Ray Hit!)

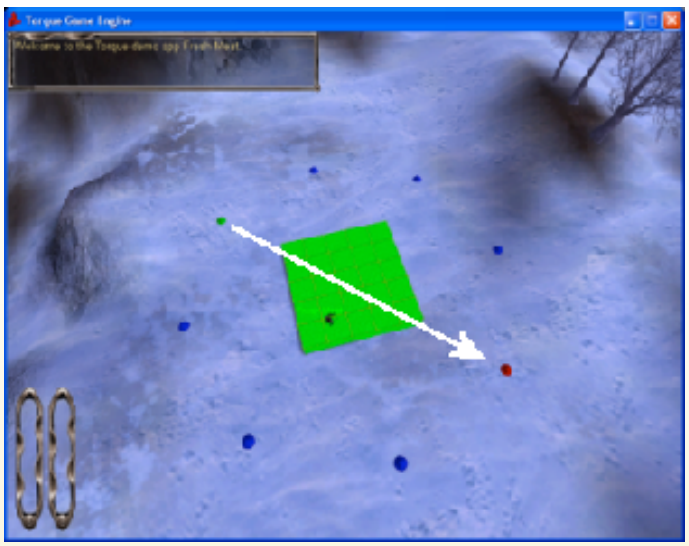

Figure 2. Ring And Box (Ray Hit!)

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Questions:

1. What kind of mesh does the box model require in order for the ray cast to hit it?

Hints:

1. The getPosition() returns the position of an object.
2. The getWorldBoxCenter() method returns the position of the center of an object.
3. A type mask of -1 hits all objects, but you can be more specific if you know the type of object you are casting to hit.
4. The box in the center of the ring is a StaticShape.
5. Don't forget to exclude any object at the starting point from your ray cast.

