Lab 11 – Prelab write up. (I don’t know why we’re expected to know this when we just learned about circular motion in class, you know the last lab)

Looks like from the materials we’ll be provided with that this lab is pretty similar to the last lab, Circular Motion. However, instead of measuring angular velocity and whatnot, we’ll be measuring the moment of inertia. As stated in the lab brief, when a force is applied to an object, the larger its inertia, the smaller its acceleration. To rotate an object, a torque would need to be applied and the angular acceleration depends on its moment of inertia. From this brief we’ll be measuring the moment of inertia and seeing the relationship between the rotation axis and moment of inertia of an object. From a quick google search, inertia is described as the angular momentum divided by the angular velocity. So to calculate the inertia of the disk, ring, and bar, we will need to know their angular momentum and their angular velocity. The angular velocity can be measured by the smart gate, where we can measure the revolutions per second, and the angular momentum can be found through knowing the mass, the velocity, and the radius.

Materials that we’ll need are as follows:

* Solid disk
* Ring
* Bar
* Rotating stage
* Force sensor
* Rotary motion sensor
* Super pulley
* Smart gate
* Mass set
* String
* Sparklink

I think the setup will be pretty similar to the last lab, we’ve got the rotating stage and a smart gate on it to record the angular velocity which can be determined by the revolutions per second. On top of the rotating stage we’ll be changing out the disk, ring, and bar. We can change the mass of the disk, ring, and bar by adding mass onto it from the mass set given. We are trying to measure the moment of inertia of the solid disk, the ring, and the bar. Variables that we will be changing includes 1) the masses of the disk, ring, and bar (this can be done by using the mass set to add mass), 2) the angular velocity we are measuring at, 3) the rotation of the bar to measure the moment of inertia changing with rotation, 4) radius of the mass on the disk, ring, or bar.

From the angular velocity, mass, and radius, we can most likely determine the moment of inertia. We’ll be measuring the angular velocity using the smart gate, and will know the mass from the weighing scale, and the radius by using a meter rule or some other provided measuring tool. Error wise, we would most likely see errors from the radius not being 100% accurate, the angular velocity being incorrectly measured due to the software lagging or the hardware not registering it properly. Other potential errors may arise from rounding off numbers or using rough guesses to calculate the necessary variables.