Calculating the mass of Jupiter- Workflow

Work through the following steps to calculate the mass of Jupiter

1. Look at Kepler's third law. Understand all the components and identify the unknowns. (*a* and *P*)

2. Use Kepler's third law to calculate the mass of the Sun. *a*=1 AU and *P*=1 year
   Use wolframalpha.com to complete calculations.

3. Set up a SPIRIT telescope to image Jupiter and its' moons. Exposure time should be 0.1 second.

4. Access and process the image using FITs liberator.

5. Use Stellarium to identify which moon is Europa.

6. Draw a line between Jupiter and Europe and measure its' size in pixels.

7. Convert the pixel size to radians, and multiply the radians by the distance Jupiter was from Earth at the time of the image to solve for *a*.

8. Use Stellarium to confirm that *P*= 3.55 days. (The orbital period for Europa around Jupiter)

9. Put *a* and *P* into Kepler's 3rd Law to solve for the mass of Jupiter. Use wolframalpha.com to complete calculations.

10. Compare answer to correct mass of Jupiter and identify where any margin of error may have come from.