1 Two body problem algorithm:

Start

input the two body masses(m_1, m_2) ,and their radii(r_1, r_2)

input the distance between them(d), and the average distance (a)

$G = 6.67 \times 10^{11}$, $\pi = \frac{22}{7}$, $AU = 1.5 \times 10^{11}$, $\theta = 1$, $\alpha = 1$, i = 1

Orbital period (p) $= 2\pi\sqrt{\frac{a^3}{G(m_2+m_2}}$

i<= p — No

Yes

$v_1 = (\frac{G \times m_1}{AU} \times (\frac{2}{d} - 1))^{0.5}$, $v_2 = (\frac{G \times m_2}{AU} \times (\frac{2}{d} - 1))^{0.5}$

$E_1 = (\frac{1}{2} \times m_1 \times v_1^2) - (\frac{G \times m_1 \times m_2}{d})$, $E_2 = (\frac{1}{2} \times m_2 \times v_2^2) - (\frac{G \times m_1 \times m_2}{d})$

$l_1 = m_1 \times v_1 \times d \times AU$, $l_2 = m_2 \times v_2 \times d \times AU$

$mr = 1 \div \frac{1}{m_1} + \frac{1}{m_2}$

$e_1 = \sqrt{1 + \frac{2 \times E_1 \times l_1^2}{mr \times (-1 \times G \times m_1 \times m_2)^2}}$, $e_2 = \sqrt{1 + \frac{2 \times E_2 \times l_2^2}{mr \times (-1 \times G \times m_1 \times m_2)^2}}$

$h_1 = \frac{l}{1 \div (\frac{1}{m_1} + \frac{1}{m_2})}$, $h_2 = \frac{l}{2 \div (\frac{1}{m_1} + \frac{1}{m_2})}$

$\theta <= 361$, $\alpha >= 361$ — No — end

Yes

calculating the change in position, then ploting

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