Zewail City of Science and Technology
PEU Program, Fall 2018-19
PEU 450: Computational Physics
Homework 8
Due date: Thursday, Nov 8th

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1. **Problems 4.3, 4.5, 4.8**. 10 points each. Notice that there are three cases for 4.5. Consider the first one for elliptical and circular orbits.

2. *Precession of the perihelion of Mercury.* Use the code you developed in class to reproduce
   (a) (2 points) Figure 4.8;
   (b) (6 points) Figure 4.9;
   (c) (12 points) Figure 4.10. Then calculate the precession rate due to the theory of general relativity.

3. Use **NDSolve** to study the chaotic tumbling of hyperion in Sec. 4.6. Basically reproduce plots similar to figures 4.17 - 4.19.