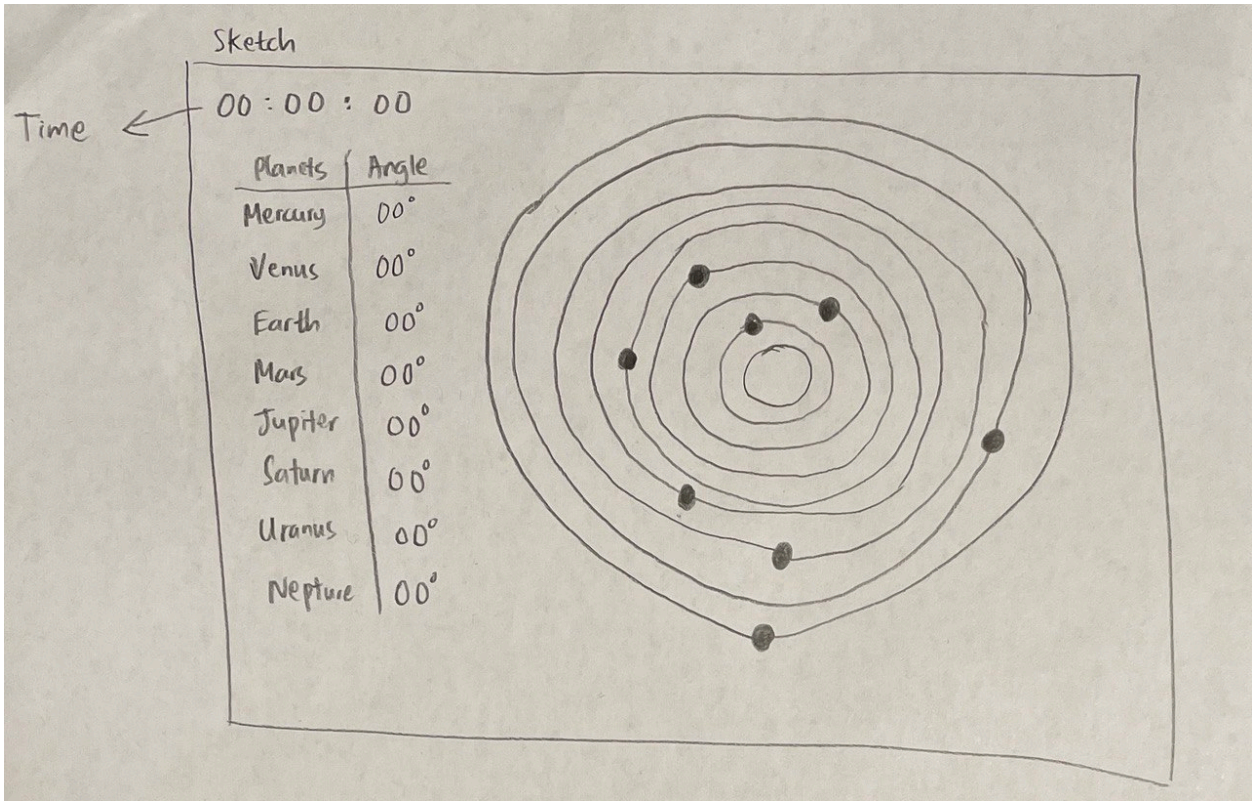
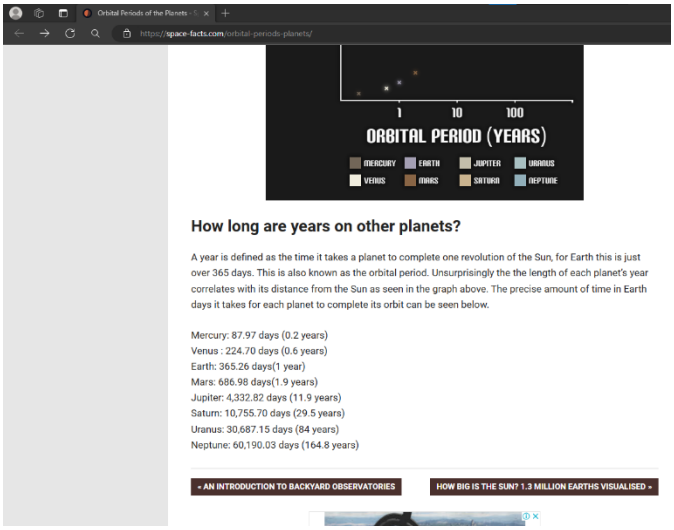
Python Turtle Project: Real-time Planetary Positions Documentation, FSM, Manuals, and Results.

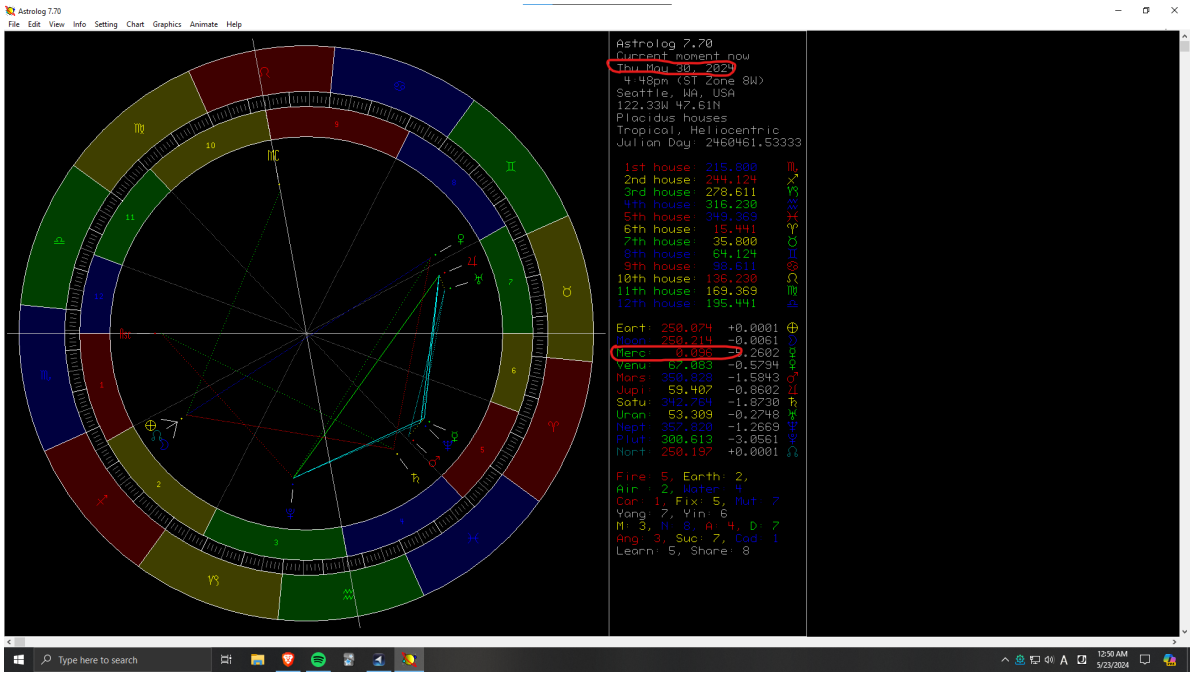


For the calculations (Algorithm):

1. Find orbital period of planets.
   Ex: Mercury – 87.97 days, Venus – 244.70 days, Earth 365.25 days, etc.



2. Find when each of the planets reach 0 degree.
   Ex:
   - Mercury – May 30th, 2024
   - Venus – April 18th, 2024
   - Earth – September 22th, 2023
   - Mars – July 28th, 2022
   - Jupiter – August 16th, 2022
   - Saturn – May 31st, 1996
   - Uranus – January 29th, 2011
   - Neptune – August 18th, 1861



Data obtained by using Astrolog Software. For example, mercury hits 0 degree when it's May 30th, 2024 by using Heliocentric approach (Sun as the reference).

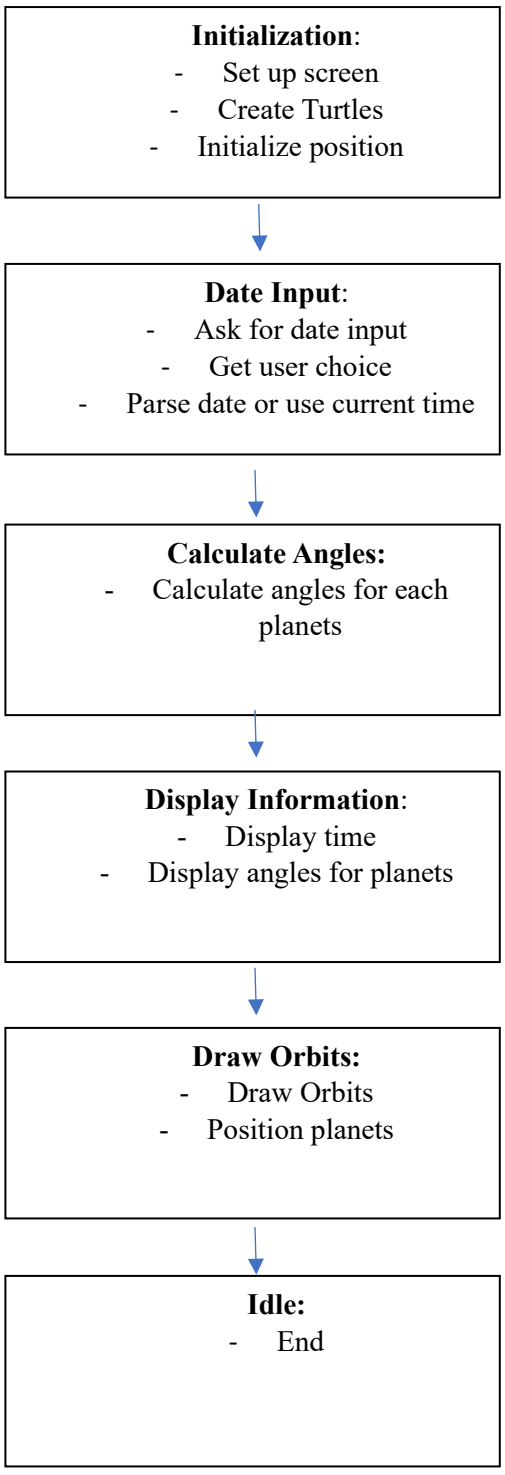
3. Calculate the current degree.
   a. Find the period time difference (ex: May 23rd, 2024)
   b. Find the time differenc, let's say we want to calculate Mercury (23-30 = 7)
   c. Find the degree

$$\frac{\boldsymbol{Time\ Difference}}{\boldsymbol{Orbital\ Period}} \times \mathbf{360}$$

$$\frac{7}{88} \times 360 = \mathbf{28.63} \rightarrow \textit{Since it's before the } 0 \textit{ degree day } (360 - 28.63 = \mathbf{331.37})$$

However, in the code, I changed the orbital period to seconds in order to get more accurate result. (Obital Period x 24 x 60 x 60).

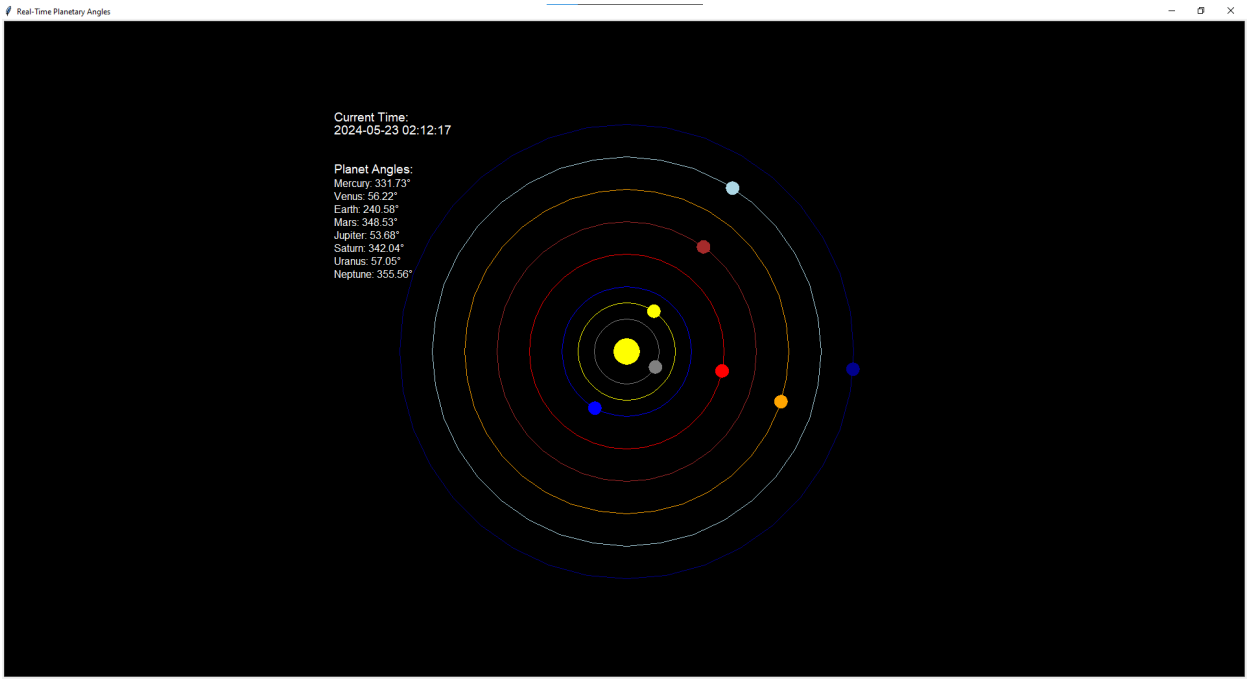
FSM (Finite State Machine):



Manuals:

1. Run the Python Code
2. Input (y or n) to the input box. If you input another alphabet, it will create a calculation for current time.
3. If you input y, you need to input again your selected date. Make sure the format is correct until to the second part, so the current time will not show up.
4. Congratulations, your program will show up.

Results:



Comparison with Astrolog Software