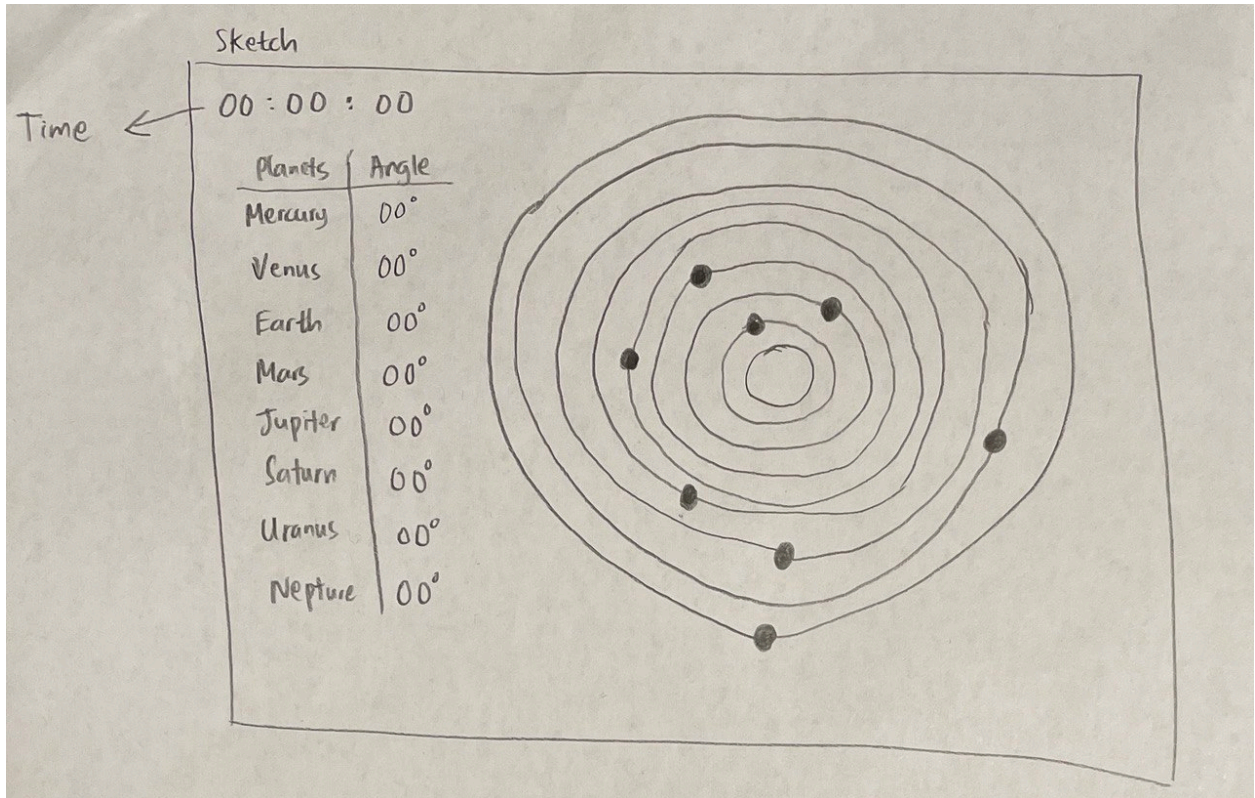


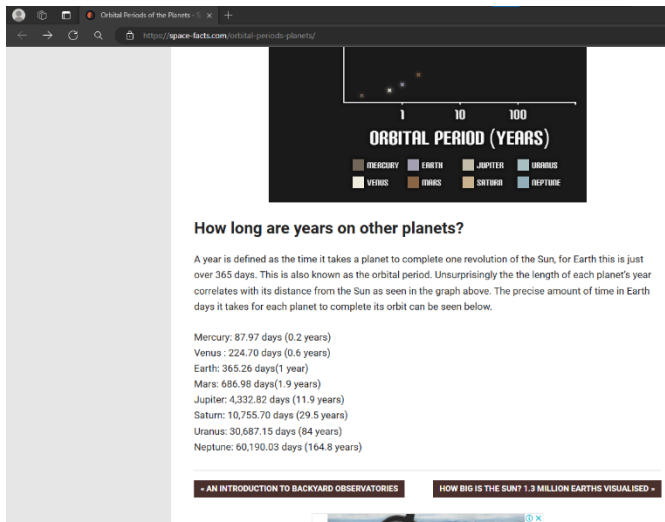
Python Turtle Project: Real-time Planetary Positions Documentation, FSM, Manuals, and Results.



For the calculations (Algorithm):

1. Find orbital period of planets.

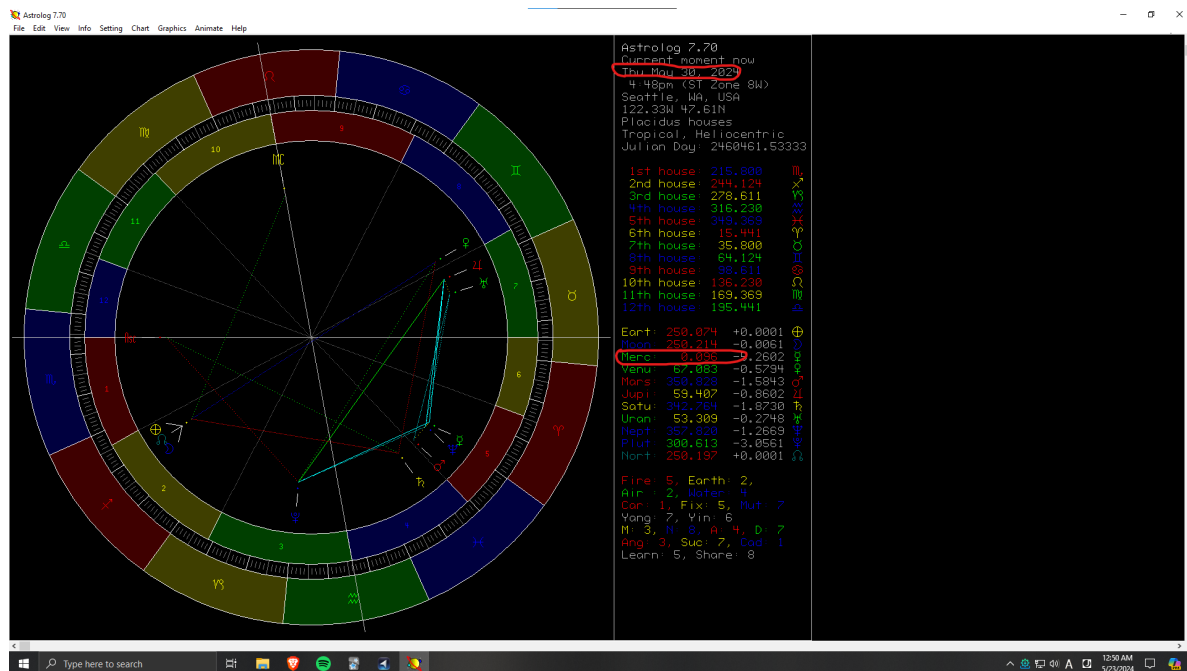
Ex: Mercury – 87.97 days, Venus – 244.70 days, Earth 365.25 days, etc.



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.

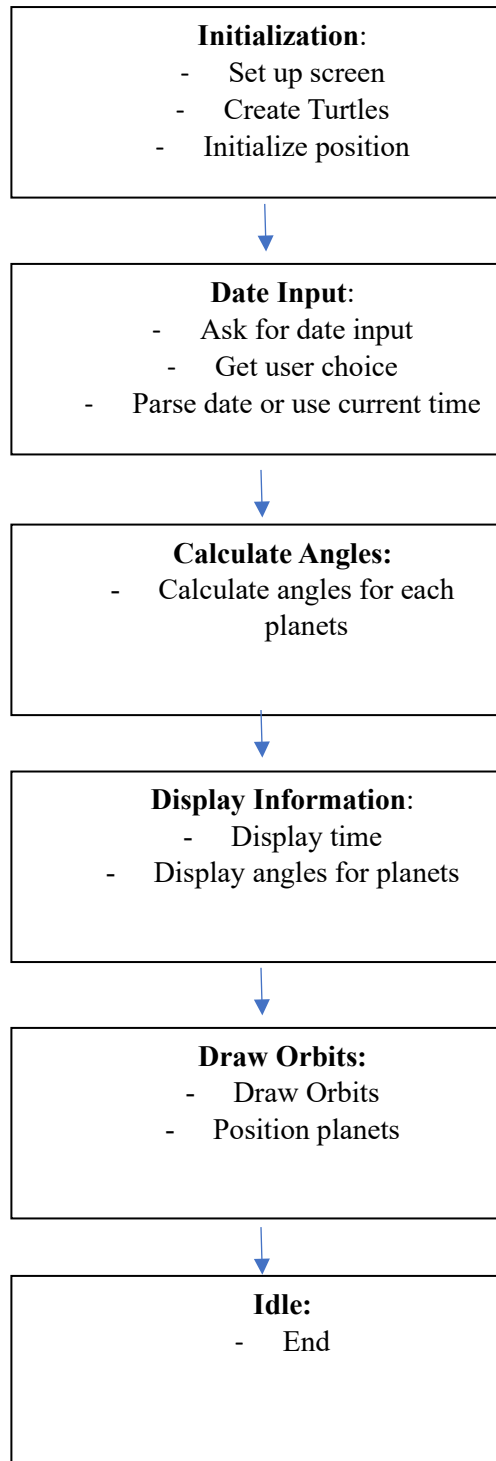
- a. Find the period time difference (ex: May 23rd, 2024)
- b. Find the time differenc, let's say we want to calculate Mercury (23-30 = 7)
- c. Find the degree

$$\frac{\text{Time Difference}}{\text{Orbital Period}} \times 360$$

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

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

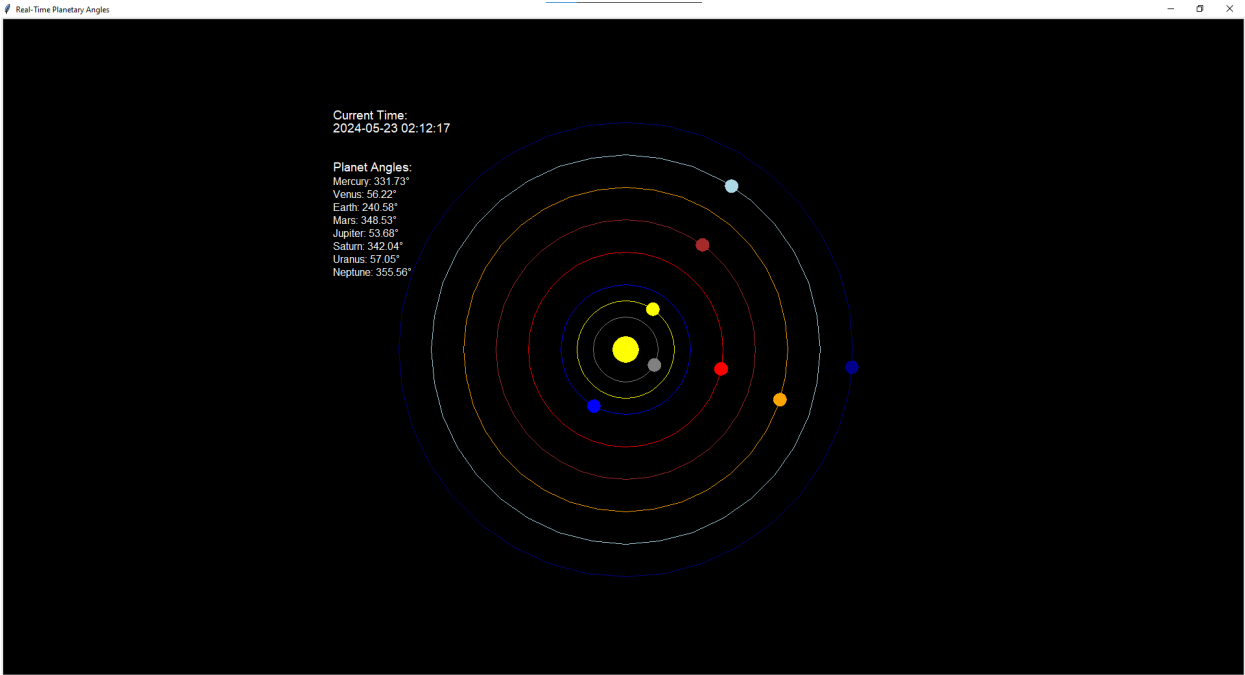
FSM (Finite State Machine):



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

Current Time:
2024-05-23 02:12:17

Planet Angles:
Mercury: 331.73°
Venus: 56.22°
Earth: 240.58°
Mars: 348.53°
Jupiter: 53.68°
Saturn: 342.04°
Uranus: 57.05°
Neptune: 355.56°

Astrolog 7.70
Current moment now
Thu May 23, 2024
10:36pm (ST Zone 8W)
Seattle, WA, USA
122.33W 47.61N
Placidus houses
Tropical, Heliocentric
Julian Day: 2460454.77506

1st house:	280.374	♈
2nd house:	327.652	♉
3rd house:	11.675	♊
4th house:	41.476	♋
5th house:	62.922	♌
6th house:	81.203	♍
7th house:	100.374	♎
8th house:	147.652	♏
9th house:	191.675	♐
10th house:	221.476	♑
11th house:	242.922	♒
12th house:	261.203	♓

Earth:	243.589	+0.0002	♁
Moon:	243.610	-0.0108	☾
Mercury:	331.044	-6.8429	☿
Venus:	56.221	-1.1999	♀
Mars:	346.553	-1.6511	♂
Jupiter:	58.803	-0.8704	♃
Saturn:	342.545	-1.8668	♄
Uranus:	53.232	-0.2758	♅
Neptune:	357.779	-1.2660	♆
Pluto:	300.581	-3.0465	♇
North:	243.701	+0.0002	♊