Exoplanets

1. Plot the date on the x-axis and the velocity on y-axis. Find the orbital period P in days.
2. Convert the orbital period P in days to years. Then using the equation $P^2 = a^3$ find a, the orbital separation, in astronomical units (A.U).
3. Now convert a into kilometers (Km) by multiplying it with 1.49598×10^8 Km. Convert period P into seconds by multiplying it with 31536000.
4. Using the relation $v_{planet} = \frac{2\pi a}{P}$, find the velocity of the planet. Using the relation

$$v_{star} = \frac{Maximumvelocity - Minimumvelocity}{2} \tag{1}$$

   find the velocity of the star.
5. Now find the mass of the planet in Solar masses, using the relation

$$M_{planet} = \frac{M_{star} v_{star}}{v_{planet}} \tag{2}$$

   where $M_{star} = 1.01 M_{\odot}$.