**Work Sheet for Our Assignment:** [**Estimating and Charting the Magnitudes of Variable Stars**](https://www.dr-ricknolthenius.com/astro8/variables/index.html)

Your Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Full instructions are on the web page linked above, and on the Canvas assignment description. This below is just your worksheets to record your work.

* Pick just 10 of the dates for each star, randomly and spread out over time. The worksheet however lists all the photograph observations. You just pick 10 for each star, leave the rest of the rows blank.
* Use the file name to infer the date and Pacific Daylight Time.
* Add 7 hours to get the Universal Time (UT).
* Go to the [**Julian Date web link**](https://www.onlineconversion.com/julian_date.htm) to find the Julian Date (JD) (2 decimals after the decimal point is fine) from the UT date in your table. Just put 0 for seconds, in the web link.
* Trim off your Julian date so there’s only 3 digits left of the decimal point to get “trimmed JD”
* Write your magnitude estimate in the last column

You’ll then use this worksheet to hand in, and also to then make your single line text file from the last two columns as described in the web page. I’ve done the first date for you, for the first star, so you can confirm your process is right.

**NOTE: I’ve decided we will skip all but the \*\*\* \*\*\* stars! Those stars are: Beta Lyrae, Delta Cephei, Eta Aquilae, S Sagittae. I’m going to leave in the other stars in this worksheet because I worked hard and I don’t wanna get rid of them! But, you can skip them.**

**Variable Star: (irregular pulsating) Alpha Herculis**

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| --- | --- | --- | --- | --- | --- |
| File name | Date (PDT) | Date (UT) | Julian Date | Trimmed JD | Magnitude |
| 2020 08 14.99 | Aug 14 23:45 | Aug 15 6:45 | 2459076.78 | 076.78 |  |
| 2020 09 03.92 |  |  |  |  |  |
| 2020 09 04.92 |  |  |  |  |  |
| 2020 09 06.88 |  |  |  |  |  |
| 2020 09 07.88 |  |  |  |  |  |
| 2020 09 16.86 |  |  |  |  |  |
| 2020 09 18.85 |  |  |  |  |  |
| 2020 09 22.91 |  |  |  |  |  |
| 2020 09 23.84 |  |  |  |  |  |
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| 2020 09 25.93 |  |  |  |  |  |
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**\*\*\* Variable Star: (EB Eclipsing Binary) Beta Lyrae \*\*\***

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| File name | Date (PDT) | Date (UT) | Julian Date | Trimmed JD | Magnitude |
| 2020 08 12.98 | Aug 12 23:33 | Aug 13 6:33 | 2459074.77 | 74.77 | 3.5 |
| 2020 08 14.96 |  |  |  |  |  |
| 2020 09 02.90 |  |  |  |  |  |
| 2020 09 03.92 |  |  |  |  |  |
| 2020 09 04.92 |  |  |  |  |  |
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| 2020 09 24.98 |  |  |  |  |  |
| 2020 09 25.92 |  |  |  |  |  |
| 2020 09 30.84 |  |  |  |  |  |
| 2020 10 03.83 |  |  |  |  |  |
| 2020 10 04.84 |  |  |  |  |  |
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**Variable Star: R Lyrae**

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| File name | Date (PDT) | Date (UT) | Julian Date | Trimmed JD | Magnitude |
| 2020 08 12.98 |  |  |  |  |  |
| 2020 08 14.96 |  |  |  |  |  |
| 2020 09 02.90 |  |  |  |  |  |
| 2020 09 03.92 |  |  |  |  |  |
| 2020 09 04.92 |  |  |  |  |  |
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**\*\*\* Variable Star: (Cepheid) Delta Cephei \*\*\***

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| File name | Date (PDT) | Date (UT) | Julian Date | Trimmed JD | Magnitude |
| 2020 08 14.98 |  |  |  |  |  |
| 2020 09 02.98 |  |  |  |  |  |
| 2020 09 03.95 |  |  |  |  |  |
|  2020 09 04.92 |  |  |  |  |  |
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|  2020 09 06.87 |  |  |  |  |  |
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**Variable Star: (Irregular pulsating) Mu Cephei**

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| File name | Date (PDT) | Date (UT) | Julian Date | Trimmed JD | Magnitude |
| 2020 08 14.98 |  |  |  |  |  |
| 2020 09 02.98 |  |  |  |  |  |
| 2020 09 03.95 |  |  |  |  |  |
|  2020 09 04.92 |  |  |  |  |  |
|  2020 09 05.87 |  |  |  |  |  |
|  2020 09 06.87 |  |  |  |  |  |
|  2020 09 07.87 |  |  |  |  |  |
|  2020 09 18.84 |  |  |  |  |  |
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|  2020 09 23.84 |  |  |  |  |  |
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|  2020 09 25.93 |  |  |  |  |  |
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**Variable Star: (Cepheid) Eta Aquilae**

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| File name | Date (PDT) | Date (UT) | Julian Date | Trimmed JD | Magnitude |
| 2020 08 12.99 |  |  |  |  |  |
| 2020 08 14.96 |  |  |  |  |  |
| 2020 09 02.90 |  |  |  |  |  |
| 2020 09 04.04 |  |  |  |  |  |
| 2020 09 05.86 |  |  |  |  |  |
| 2020 09 06.86 |  |  |  |  |  |
| 2020 09 07.87 |  |  |  |  |  |
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| 2020 09 18.83  |  |  |  |  |  |
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**Variable Star: (semi-regular pulsating) g Herculis**

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| File name | Date (PDT) | Date (UT) | Julian Date | Trimmed JD | Magnitude |
| 2020 08 12.98 |  |  |  |  |  |
| 2020 08 14.98 |  |  |  |  |  |
| 2020 09 02.91 |  |  |  |  |  |
| 2020 09 04.92 |  |  |  |  |  |
| 2020 09 05.87 |  |  |  |  |  |
| 2020 09 06.87 |  |  |  |  |  |
| 2020 09 07.87 |  |  |  |  |  |
| 2020 09 16.86 |  |  |  |  |  |
| 2020 09 18.94 |  |  |  |  |  |
| 2020 09 22.91 |  |  |  |  |  |
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**\*\*\*Variable Star: (RV Tauri pulsating star) R Scuti \*\*\* (Is NOT a periodic star)**

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| File name | Date (PDT) | Date (UT) | Julian Date | Trimmed JD | Magnitude |
| 2020 08 13.00 |  |  |  |  |  |
| 2020 09 02.90 |  |  |  |  |  |
| 2020 09 04.82 |  |  |  |  |  |
| 2020 09 05.86 |  |  |  |  |  |
| 2020 09 06.86 |  |  |  |  |  |
| 2020 09 07.89 |  |  |  |  |  |
| 2020 09 16.85 |  |  |  |  |  |
| 2020 09 18.94 |  |  |  |  |  |
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**Variable Star: (irregular pulsating) U Delphini**

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| File name | Date (PDT) | Date (UT) | Julian Date | Trimmed JD | Magnitude |
| 2020 08 13.05 |  |  |  |  |  |
| 2020 08 14.95 |  |  |  |  |  |
| 2020 09 03.92 |  |  |  |  |  |
| 2020 09 04.82 |  |  |  |  |  |
| 2020 09 05.87 |  |  |  |  |  |
| 2020 09 06.87 |  |  |  |  |  |
| 2020 09 07.87 |  |  |  |  |  |
| 2020 09 16.88 |  |  |  |  |  |
| 2020 09 18.83 |  |  |  |  |  |
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| 2020 09 25.93 |  |  |  |  |  |
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| 2020 10 03.83 |  |  |  |  |  |
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**Variable Star: (Cepheid) S Sagittae**

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| File name | Date (PDT) | Date (UT) | Julian Date | Trimmed JD | Magnitude |
| 2020 08 13.05 |  |  |  |  |  |
| 2020 08 14.95 |  |  |  |  |  |
| 2020 09 03.92 |  |  |  |  |  |
| 2020 09 04.82 |  |  |  |  |  |
| 2020 09 05.87 |  |  |  |  |  |
| 2020 09 06.87 |  |  |  |  |  |
| 2020 09 07.87 |  |  |  |  |  |
| 2020 09 16.88 |  |  |  |  |  |
| 2020 09 18.83 |  |  |  |  |  |
| 2020 09 22.88 |  |  |  |  |  |
| 2020 09 23.83 |  |  |  |  |  |
| 2020 09 23.84 |  |  |  |  |  |
| 2020 09 24.92 |  |  |  |  |  |
| 2020 09 25.93 |  |  |  |  |  |
| 2020 09 30.87 |  |  |  |  |  |
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 **Variable Star: (Cepheid) X Sagittarii**

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| File name | Date (PDT) | Date (UT) | Julian Date | Trimmed JD | Magnitude |
| 2020 08 13.03 |  |  |  |  |  |
| 2020 08 14.95  |  |  |  |  |  |
| 2020 09 03.91 |  |  |  |  |  |
| 2020 09 04.93 |  |  |  |  |  |
| 2020 09 05.86 |  |  |  |  |  |
| 2020 09 06.86 |  |  |  |  |  |
| 2020 09 07.86 |  |  |  |  |  |
| 2020 09 16.84 |  |  |  |  |  |
| 2020 09 18.83 |  |  |  |  |  |
| 2020 09 22.84 |  |  |  |  |  |
| 2020 09 23.83 |  |  |  |  |  |
| 2020 09 25.92 |  |  |  |  |  |
| 2020 09 27.82 |  |  |  |  |  |
| 2020 09 30.82 |  |  |  |  |  |
| 2020 09 30.88 |  |  |  |  |  |
| 2020 09 30.89 |  |  |  |  |  |
| 2020 10 03.81 |  |  |  |  |  |
| 2020 10 04.82 |  |  |  |  |  |
| 2020 10 09.83 |  |  |  |  |  |
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 **Variable Star: (Cepheid) W Sagittarii**

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| File name | Date (PDT) | Date (UT) | Julian Date | Trimmed JD | Magnitude |
| 2020 08 13.03 |  |  |  |  |  |
| 2020 08 14.95  |  |  |  |  |  |
| 2020 09 03.91 |  |  |  |  |  |
| 2020 09 04.93 |  |  |  |  |  |
| 2020 09 05.86 |  |  |  |  |  |
| 2020 09 06.86 |  |  |  |  |  |
| 2020 09 07.86 |  |  |  |  |  |
| 2020 09 16.84 |  |  |  |  |  |
| 2020 09 18.83 |  |  |  |  |  |
| 2020 09 22.84 |  |  |  |  |  |
| 2020 09 23.83 |  |  |  |  |  |
| 2020 09 25.92 |  |  |  |  |  |
| 2020 09 27.82 |  |  |  |  |  |
| 2020 09 30.82 |  |  |  |  |  |
| 2020 09 30.88 |  |  |  |  |  |
| 2020 09 30.89 |  |  |  |  |  |
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| 2020 10 04.82 |  |  |  |  |  |
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