Product User Guide

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Overview

SkyMap was created to allow users to enter a specific date, time, and location and see a resulting map of the sky. The software can identify Earth's moon and its phase (if visible), visible stars up to the 6th magnitude, planets, constellations, and other Messier deep space objects. The user can toggle the labels on the SkyMap and save or print the image.

Intended Audience

SkyMap was created for amateur astronomers, students, and anyone who has an interest in astronomy.

System Requirements

SkyMap is compatible with the following operating systems:

- Java SE 8 or later
- Windows 7 or later
- macOS 10.12 Sierra or later

*NOTE: The latest operating system is recommended for optimal results.

Legal

Background Credits

Background Images courtesy of NASA, ESA, the Hubble Heritage Team (STScI/AURA), A. Nota (ESA/STScI), and the Westerlund 2 Science Team

Icon Credits

Audience icon made by Freepik from www.flaticon.com
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Switch icon made by Freepik from www.flaticon.com
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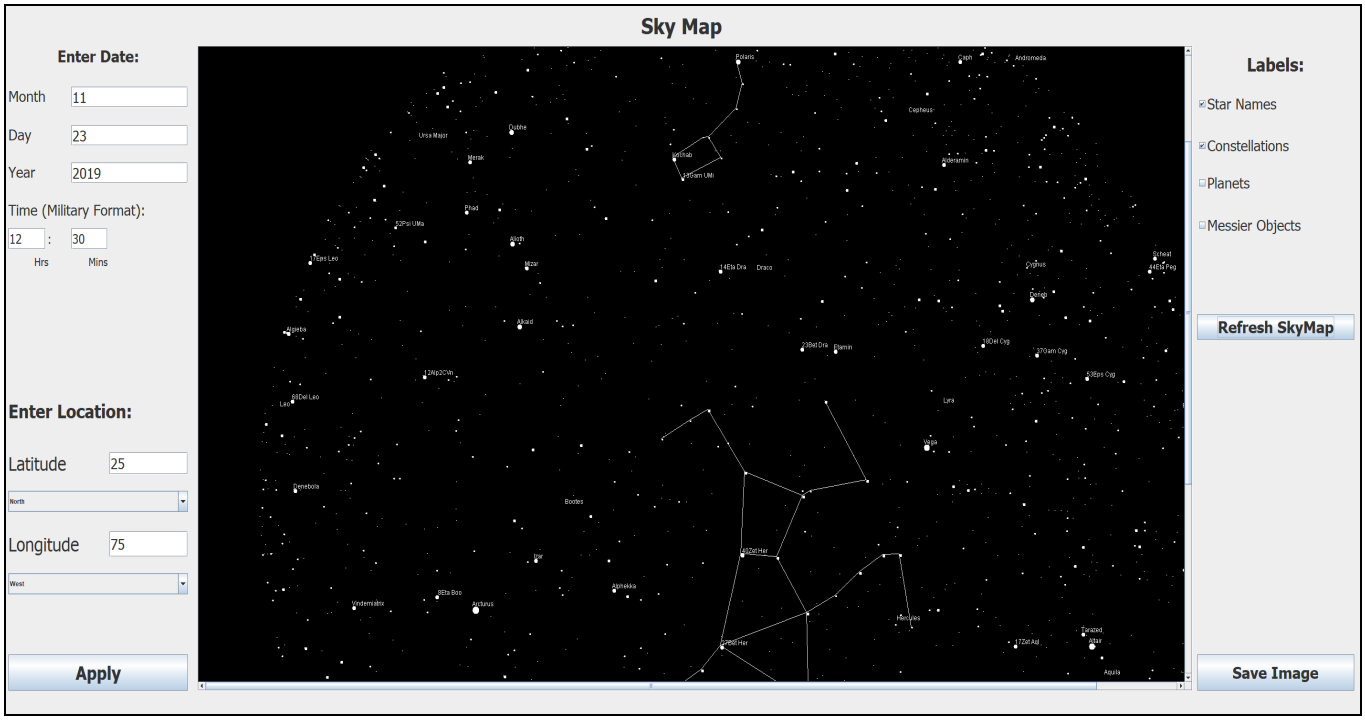
Accessing the Software

SkyMap is an executable application that can be downloaded and run locally on a machine with the minimum specifications listed in System Requirements. You can access SkyMap at the following address: https://github.com/denvercoder2/Senior_Project.git.

Navigating the Home Page

- SkyMap is set up to make it easy to find a map of the sky for a given date, time, and location.
- The left side of the home page contains fields for **Date**, **Time**, and Location (**Latitude** and **Longitude**).
- The right side of the home page contains fields that allow you to toggle the labels produced for visible stars, constellations, planets, and Messier deep space objects.
- You can re-enter a new location or change your labeling settings and use the **Refresh SkyMap** button to refresh the map.
- If you wish to save the image (or print the image), click the **Save Image** button at the lower right of the screen.

*NOTE: All fields must be completed. Failure to complete all fields will result in an error message. See Troubleshooting.

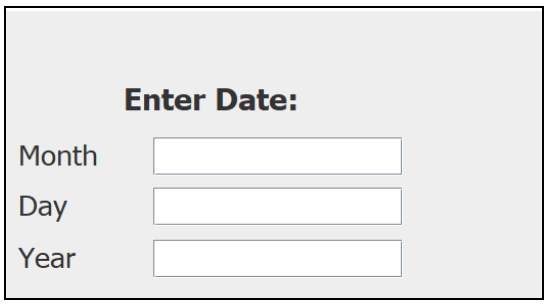


Entering the Date

SkyMap allows you to enter any date from 1 January 1900 through 31 December 2100. Entering an invalid date will produce an error message. See Troubleshooting.

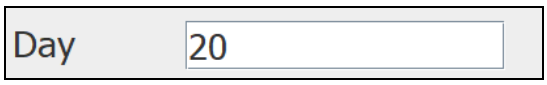
To enter the date:

Under the **Enter Date** field, you will see entry fields for **Month**, **Day**, and **Year**.

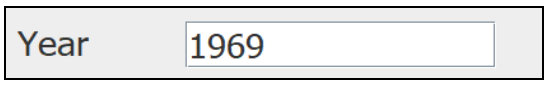


In the **Month** field, manually enter the number corresponding to the month you would like to enter (ex. For July, enter '7.')

In the **Day** field, manually enter the day of the month (1-31).



In the **Year** field, manually enter the year in YYYY format (ex. 1969).

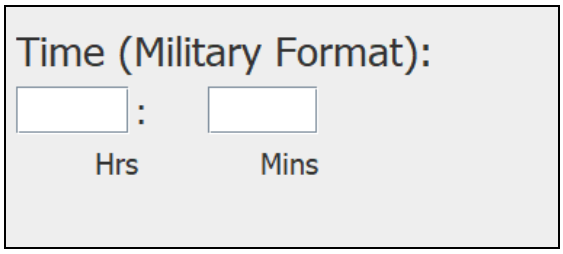


Entering the Time

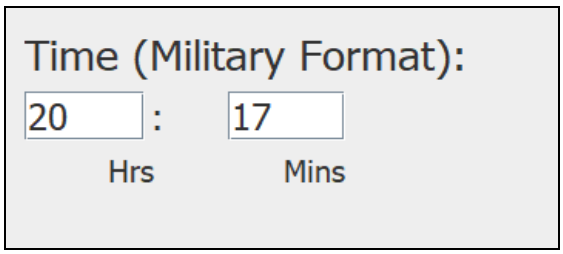
SkyMap allows you to enter the time of day in hours and minutes in order to produce a map of the sky for that time.

To enter the time:

Under the **Enter Date** field, you will see a field for **Time**.



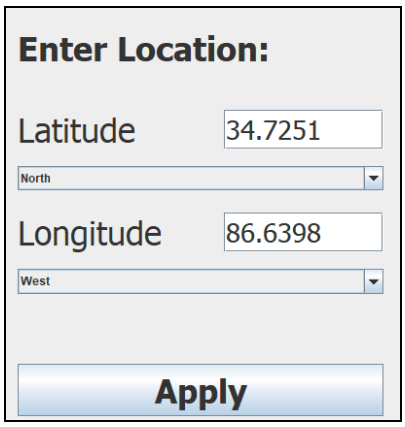
In the **Time** field, enter the hour of the day in the left-hand box (00-24). Enter the minute in the right-hand box (00-59).



*NOTE: The time must be entered in 24-hour military format.

Entering the Location

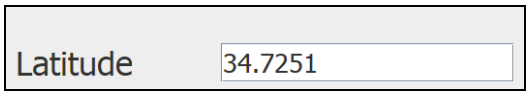
SkyMap allows you to enter Earth's latitude and longitude in degrees to see a map of the sky at your given location.



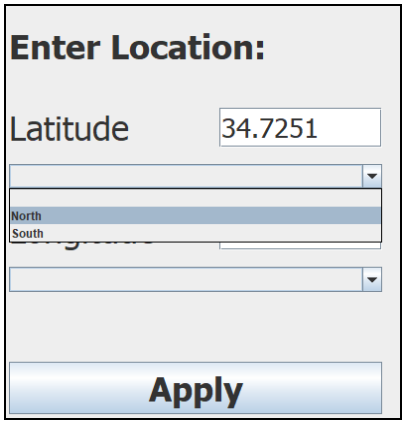
To enter the Latitude:

Under the **Enter Location** field, you will see a field for **Latitude**.

In the box next to **Latitude** enter the degrees latitude.



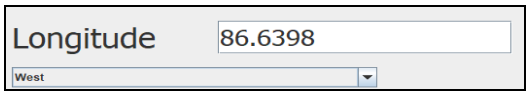
In the drop-down field below **Latitude**, select either **North** or **South**.



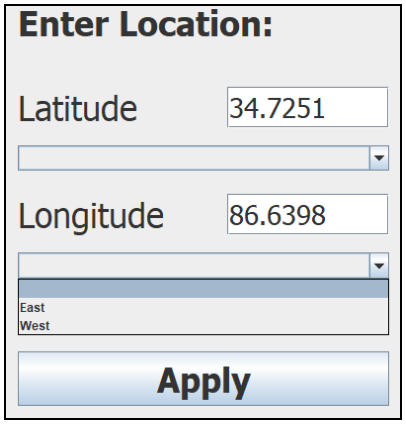
To enter the Longitude:

Under the **Enter Location** field, you will see a field for **Longitude**.

In the box next to **Longitude**, enter the degrees longitude.



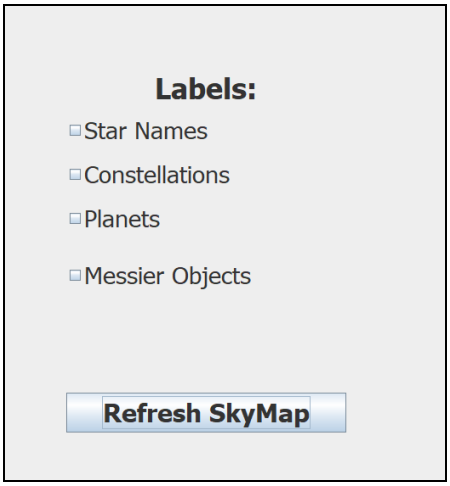
In the drop-down field below **Longitude**, select either **East** or **West**.



When you have entered the latitude and longitude, click **Apply**.

Showing & Hiding Labels

SkyMap allows you to toggle the labels that appear for visible stars, constellations, planets, and Messier deep space objects.



To toggle the labels for Star Names:

1. Under the **Labels** field, click the button to the left of **Star Names**.
2. Clicking this button will show the names of visible stars up to the 6th magnitude.
3. To hide the labels for **Star Names**, click the button again. Then click the **Refresh SkyMap** button.

To toggle the labels for constellations:

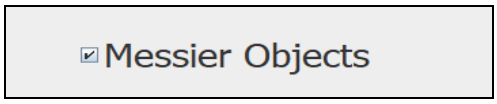
1. Under the **Labels** field, click the button to the left of **Constellations**.
2. Clicking this button will show the names of visible constellations.
3. To hide the labels for **Constellations**, click the button again. Then click the **Refresh SkyMap** button.

To toggle the labels for planets:

1. Under the **Labels** field, click the button to the left of **Planets**.
2. Clicking this button will show the names of visible planets.
3. To hide the labels for **Planets**, click the button again. Then click the **Refresh SkyMap** button.

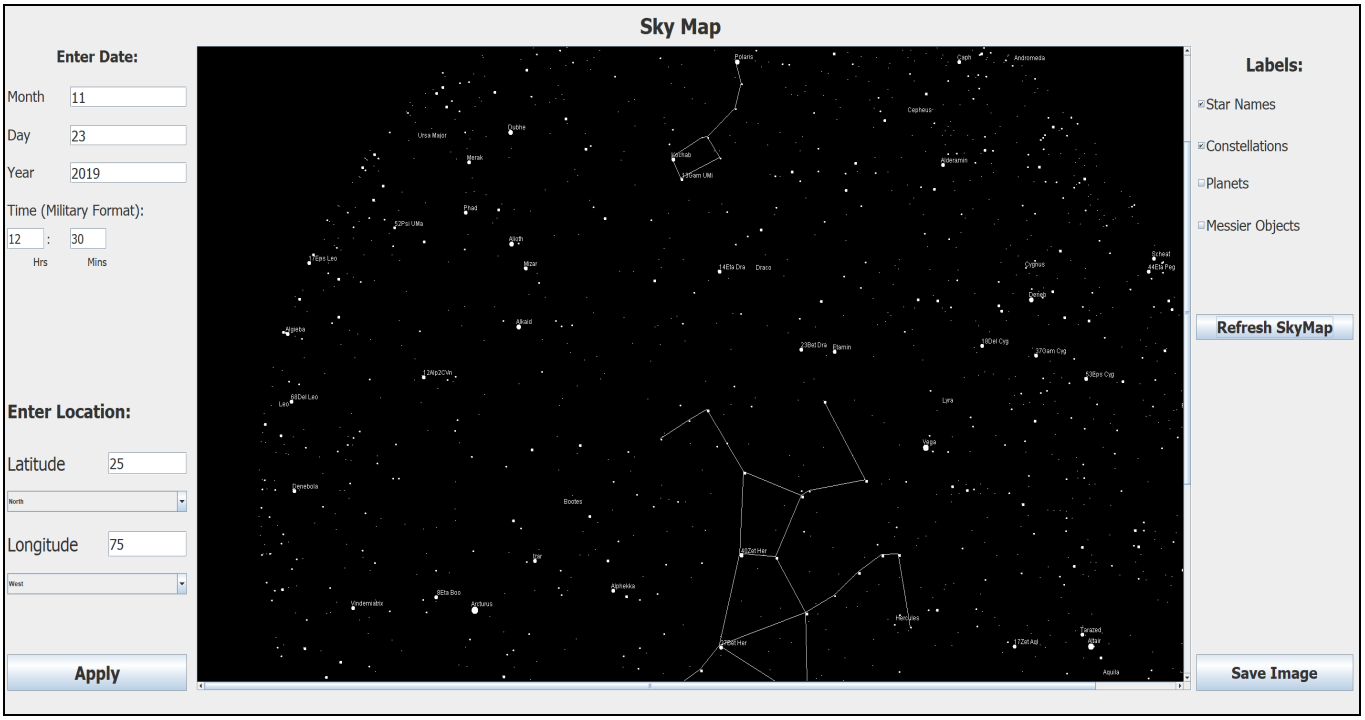
To toggle the labels for Messier deep space objects:

1. Under the "Labels" field, click the button to the left of **Messier Objects**.
2. Clicking this button will show the names of visible Messier deep space objects.
3. To hide the labels for **Messier Objects**, click the button again. Then click the **Refresh SkyMap** button.



Interpreting the Results

Once you have created a SkyMap based on a specified date, time, and location, you can view a scrollable map in the center of the home page.



To scroll the SkyMap, click the up or down buttons on the scroll bars to the right and bottom of the map pane.

If you have chosen to show labels for individual objects (stars, constellations, planets, and Messier deep space objects), you will easily be able to identify the different bodies in the map pane.

Identifying Magnitude

Only objects (other than Messier objects) that are visible to the naked eye will appear in the SkyMap. Each object's magnitude (or brightness) is represented by the size of its corresponding pinpoint. Therefore, brighter objects are indicated by a larger pinpoint, while dimmer objects have a smaller pinpoint.

Saving & Printing Results

To save a SkyMap image, click the **Save Image** button.

Follow the prompts to name and save the image to a file on your computer. To print the image, find your saved image and select File>Print.

Troubleshooting

Q. SkyMap will not load. What's wrong?

A. You do not have the correct version of Java or it is not in your path to run. See System Requirements.

A. The file is corrupted. Delete and re-download the application.

Q. Why am I receiving an error message?

A. You have entered an invalid date in one of the **Enter Date** fields. Valid dates are dates from 1 January 1900 through 31 December 2100. Entering a date prior to 1 January 1900 or after 31 December 2100 will prompt the error message **"Please Enter Valid Inputs!"** Invalid fields will be outlined in red as shown below.

A. You have not completed all necessary fields. All fields for **Date**, **Time**, **Latitude**, and **Longitude** must be completed for the SkyMap to render. Omitting data from any of these fields will prompt the error message **"Please Enter Valid Inputs!"** Empty fields will be outlined in red as shown below.