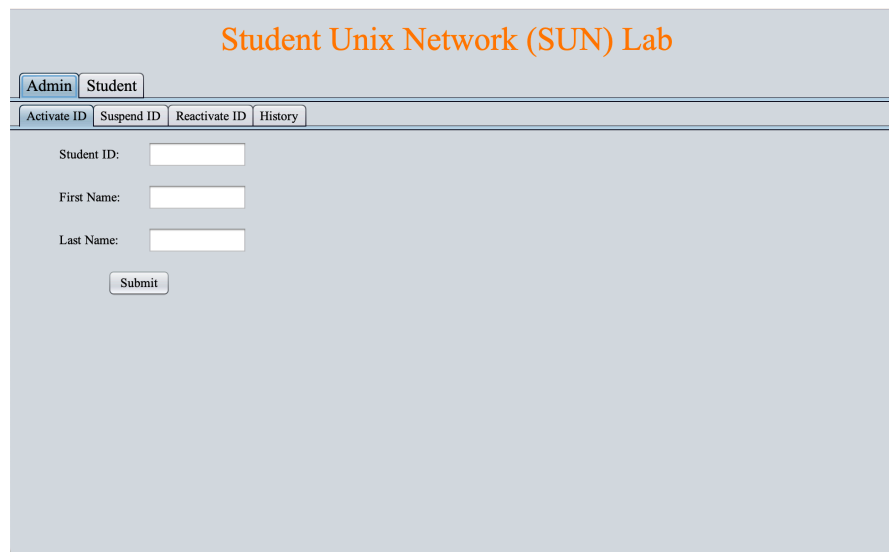


Engineering Requirements - Implementation

IMPORTANT NOTE: The password for the database is cmpsc487W.

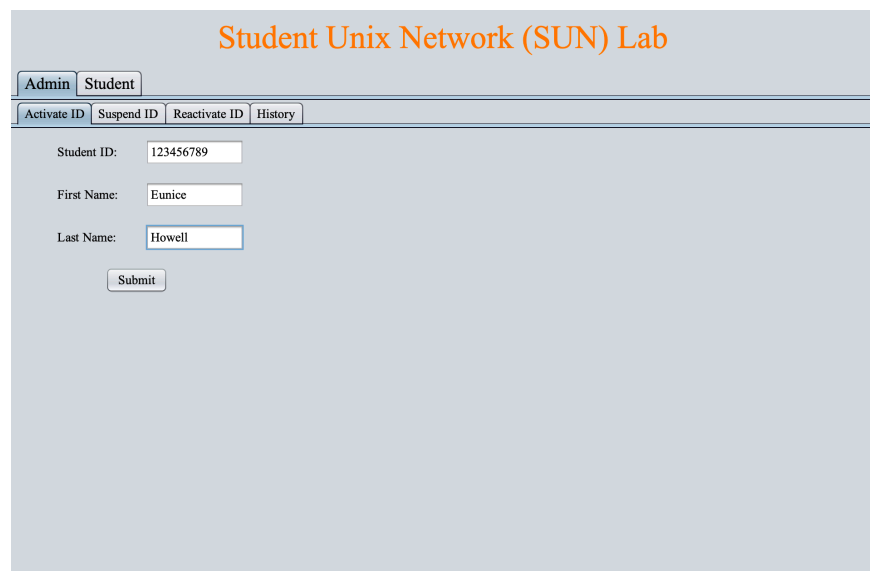
When the code is first run, the picture to the right is displayed. This is under the Activate ID tab of the Admin tab.



The screenshot shows the 'Student Unix Network (SUN) Lab' interface. At the top, there are two tabs: 'Admin' and 'Student'. Below them, there are four sub-tabs: 'Activate ID', 'Suspend ID', 'Reactivate ID', and 'History'. The 'Activate ID' tab is currently selected. The form contains three text input fields labeled 'Student ID:', 'First Name:', and 'Last Name:'. A 'Submit' button is located below the 'Last Name' field.

Admin Tab Activating a Student ID

To activate a student ID, the admin must navigate to the “Activate ID” tab. Once the user is on the tab, three blank text boxes will be displayed. To activate a student ID, the user must input a student ID, the student’s first name, and the student’s last name. The student must not yet be in the system to activate an ID.



This screenshot shows the same 'Student Unix Network (SUN) Lab' interface as the previous one, but with sample data entered into the text boxes. The 'Student ID' field contains '123456789', the 'First Name' field contains 'Eunice', and the 'Last Name' field contains 'Howell'. The 'Submit' button remains below the fields.

Once the information is completed, the user must click the “Submit” button, displayed below the text boxes. After “Submit” is clicked, the text boxes will be reset and a message will appear saying the student’s ID has been activated.

Student Unix Network (SUN) Lab

Admin

Student

Activate ID

Suspend ID

Reactivate ID

History

Student ID:

First Name:

Last Name:

Submit

The ID for Howell, Eunice (123456789) has been activated

Since the student ID is unique to each student, if an inputted student ID already exists in the system, then a message will display saying the ID is already activated, regardless of the name. This is to ensure that two different students are not mistakenly entered into the system with the same ID.

Student Unix Network (SUN) Lab

Admin

Student

Activate ID

Suspend ID

Reactivate ID

History

Student ID:

111111111

First Name:

Mary Ann

Last Name:

Summer

Submit



Student Unix Network (SUN) Lab

Admin

Student

Activate ID

Suspend ID

Reactivate ID

History

Student ID:

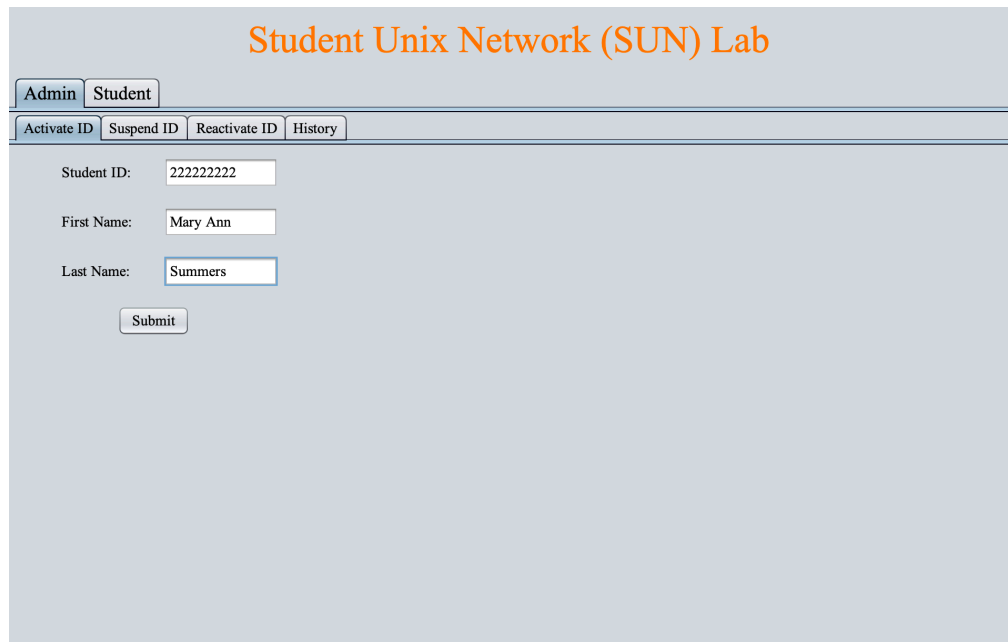
First Name:

Last Name:

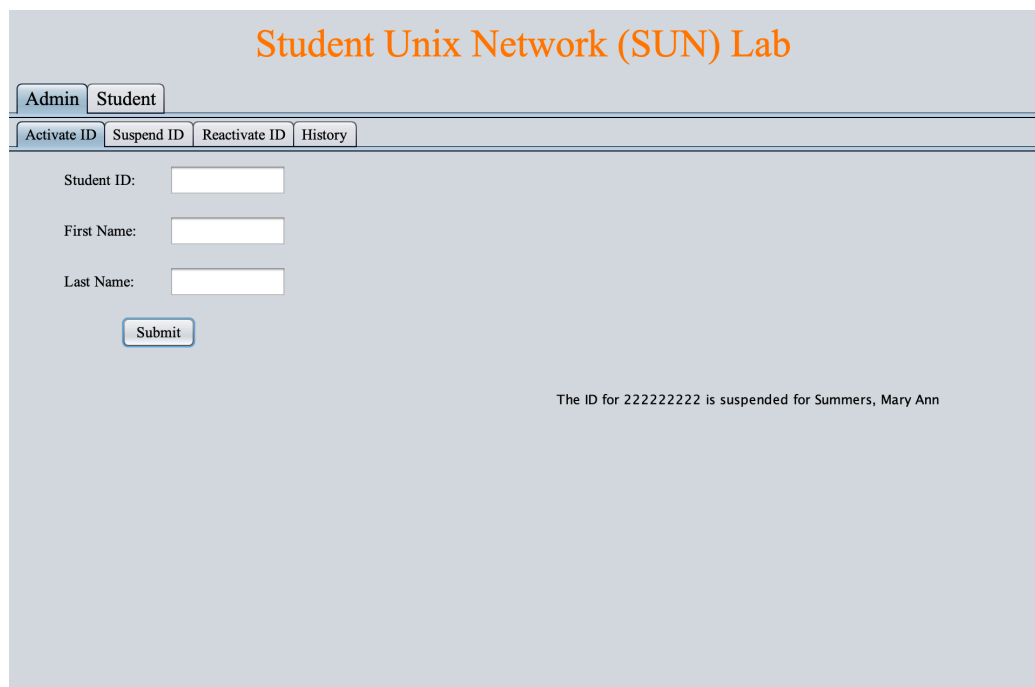
Submit

The ID for 111111111 is already activated for Grant, Ginger

If a student ID matches that of a student who has a currently suspended ID, then a message tells the user the student has a suspended ID. If the user wants to reactivate a student's ID, the user must use Reactivate ID (implementation will be covered later). This is to ensure that the user wants to reactivate a suspended student's ID and that the user is not mistakenly activating an ID for someone who is not supposed to have access to the SUN Lab.



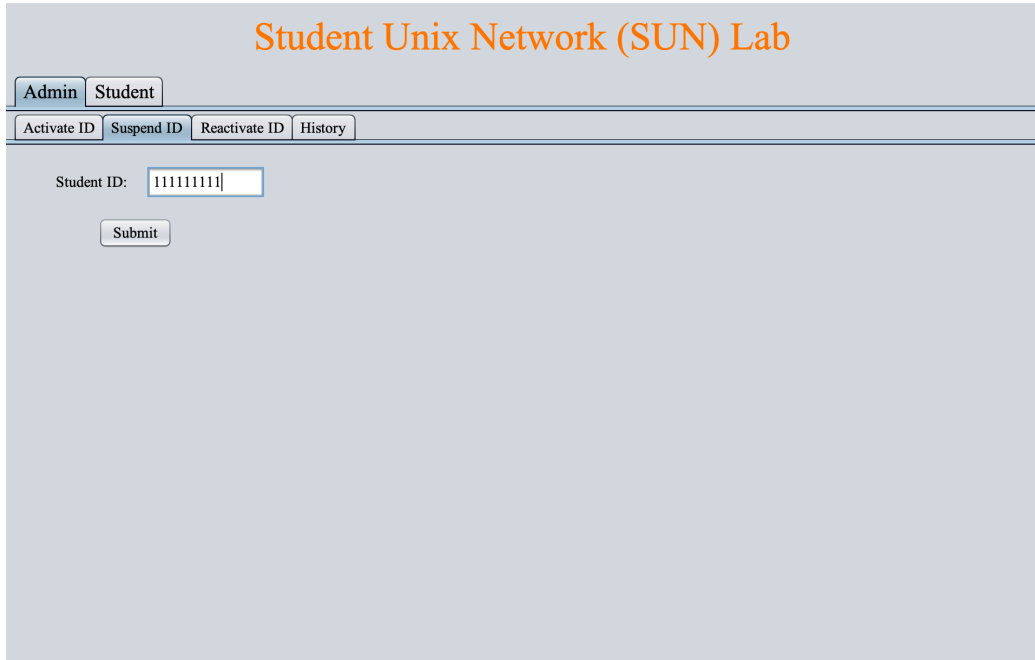
The screenshot shows the 'Student Unix Network (SUN) Lab' interface. At the top, there is a title 'Student Unix Network (SUN) Lab' in orange. Below the title, there are two tabs: 'Admin' and 'Student'. Under the 'Student' tab, there are four sub-tabs: 'Activate ID', 'Suspend ID', 'Reactivate ID', and 'History'. The 'Activate ID' sub-tab is selected. The form contains three input fields: 'Student ID:' with the value '22222222', 'First Name:' with the value 'Mary Ann', and 'Last Name:' with the value 'Summers'. Below these fields is a 'Submit' button.



The screenshot shows the same 'Student Unix Network (SUN) Lab' interface as the first screenshot. The 'Student' tab is selected, and the 'Activate ID' sub-tab is selected. The form contains three empty input fields: 'Student ID:', 'First Name:', and 'Last Name:'. Below these fields is a 'Submit' button. At the bottom right of the form, there is a message: 'The ID for 22222222 is suspended for Summers, Mary Ann'.

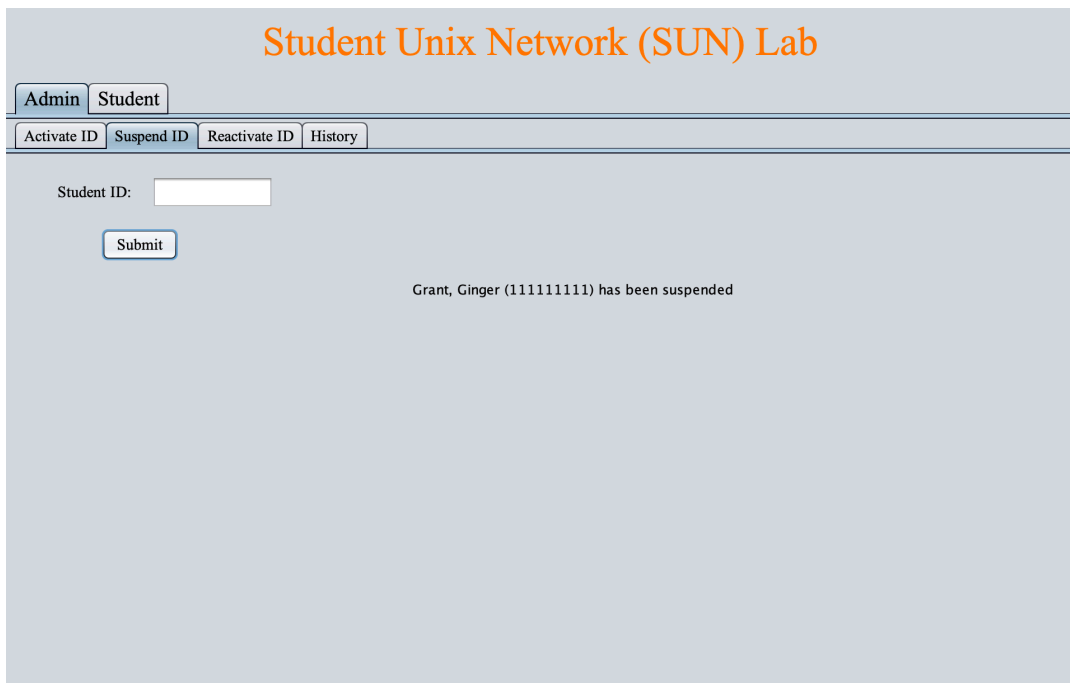
Suspending a Student ID

To suspend a student ID, the admin must navigate to the “Suspend ID” tab. Once there, a blank text box will be displayed. To suspend a student, the user must input the student’s ID. The student must have a currently activated or reactivated ID in order to be suspended.



The screenshot shows the "Student Unix Network (SUN) Lab" interface. At the top, there is a title bar with the text "Student Unix Network (SUN) Lab" in orange. Below the title bar, there are two tabs: "Admin" and "Student". The "Student" tab is selected. Under the "Student" tab, there are four sub-tabs: "Activate ID", "Suspend ID", "Reactivate ID", and "History". The "Suspend ID" sub-tab is selected. In the main area, there is a label "Student ID:" followed by a text input field containing the value "11111111". Below the input field is a "Submit" button.

Once the student ID is inputted, the user must click “Submit” to suspend the student’s ID. A message with the student’s ID, and the name associated with that ID, will appear, saying the student has been suspended.



The screenshot shows the "Student Unix Network (SUN) Lab" interface after the "Submit" button was clicked. The "Student ID:" label is now followed by an empty text input field. Below the input field is a "Submit" button. In the center of the main area, a message is displayed: "Grant, Ginger (11111111) has been suspended".

If the inputted student ID matches that of an already suspended student, a message tells the user the student was already suspended.

Student Unix Network (SUN) Lab

Admin

Student

Activate ID

Suspend ID

Reactivate ID

History

Student ID:



Student Unix Network (SUN) Lab

Admin

Student

Activate ID

Suspend ID

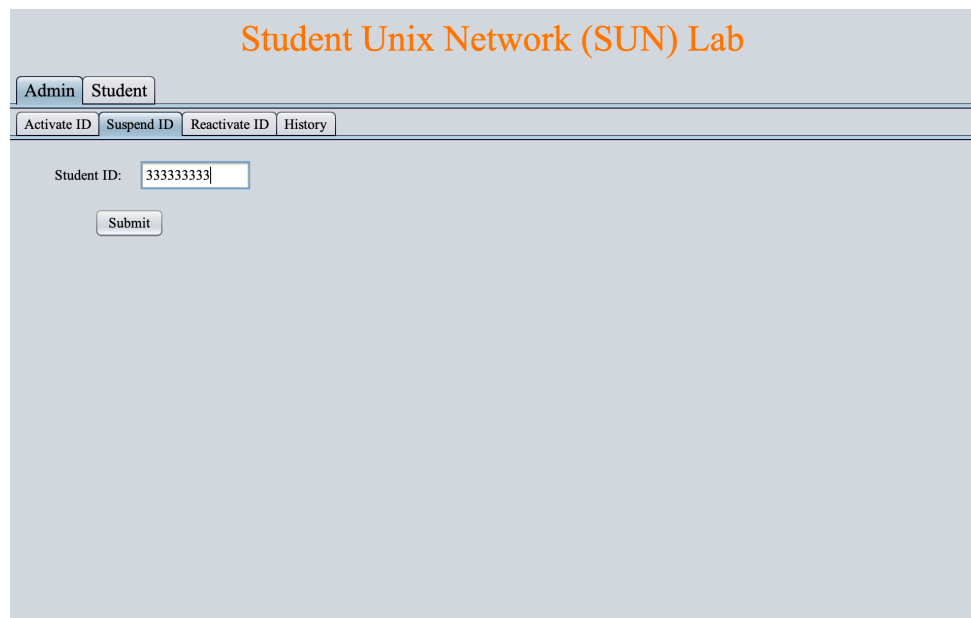
Reactivate ID

History

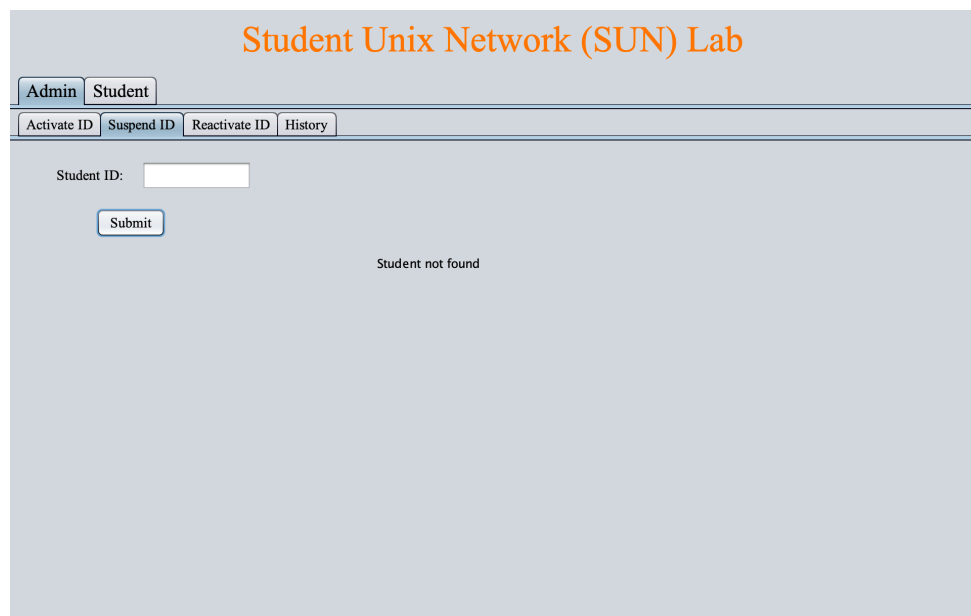
Student ID:

Student is already suspended

If the inputted student ID does not match any student in the system, a message will tell the user that the student is not in the system.



The screenshot shows the 'Student Unix Network (SUN) Lab' interface. At the top, there are two tabs: 'Admin' and 'Student'. Below the tabs, there are four buttons: 'Activate ID', 'Suspend ID', 'Reactivate ID', and 'History'. A 'Student ID:' label is followed by a text input field containing '333333333'. Below the input field is a 'Submit' button.

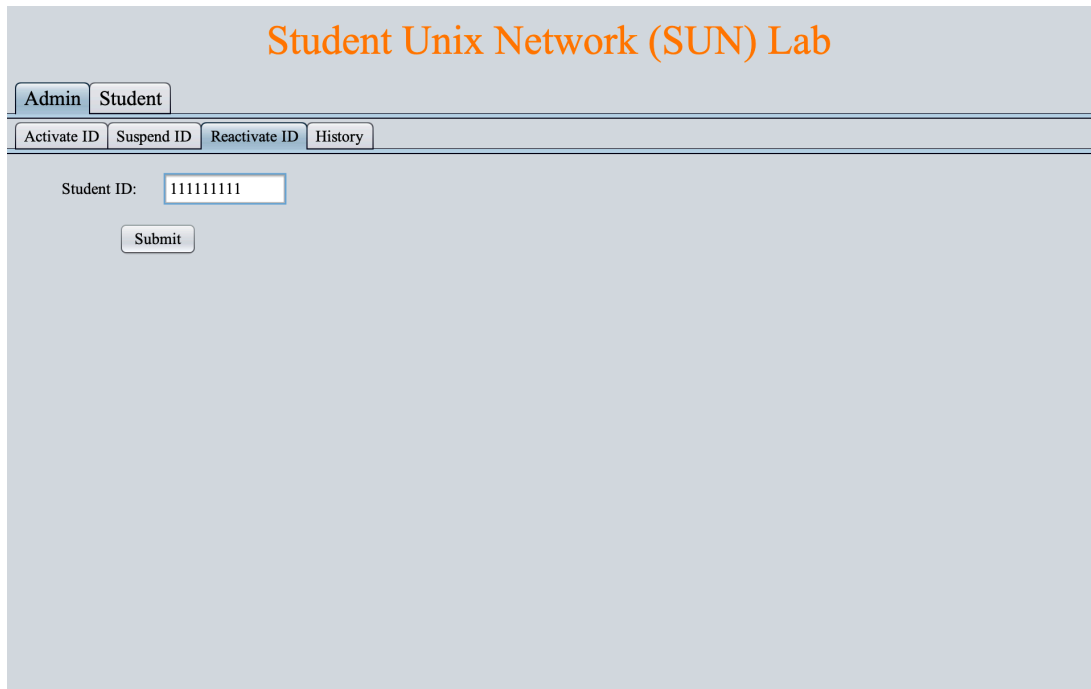


The screenshot shows the 'Student Unix Network (SUN) Lab' interface. At the top, there are two tabs: 'Admin' and 'Student'. Below the tabs, there are four buttons: 'Activate ID', 'Suspend ID', 'Reactivate ID', and 'History'. A 'Student ID:' label is followed by an empty text input field. Below the input field is a 'Submit' button. To the right of the 'Submit' button, the text 'Student not found' is displayed.

IMPORTANT NOTE: If a student is currently checked into the SUN Lab, then the student is given temporary access to the SUN Lab. Once the student checks out of the SUN Lab, the student will have a suspended ID and will not be able to reenter the SUN Lab without a reactivated ID.

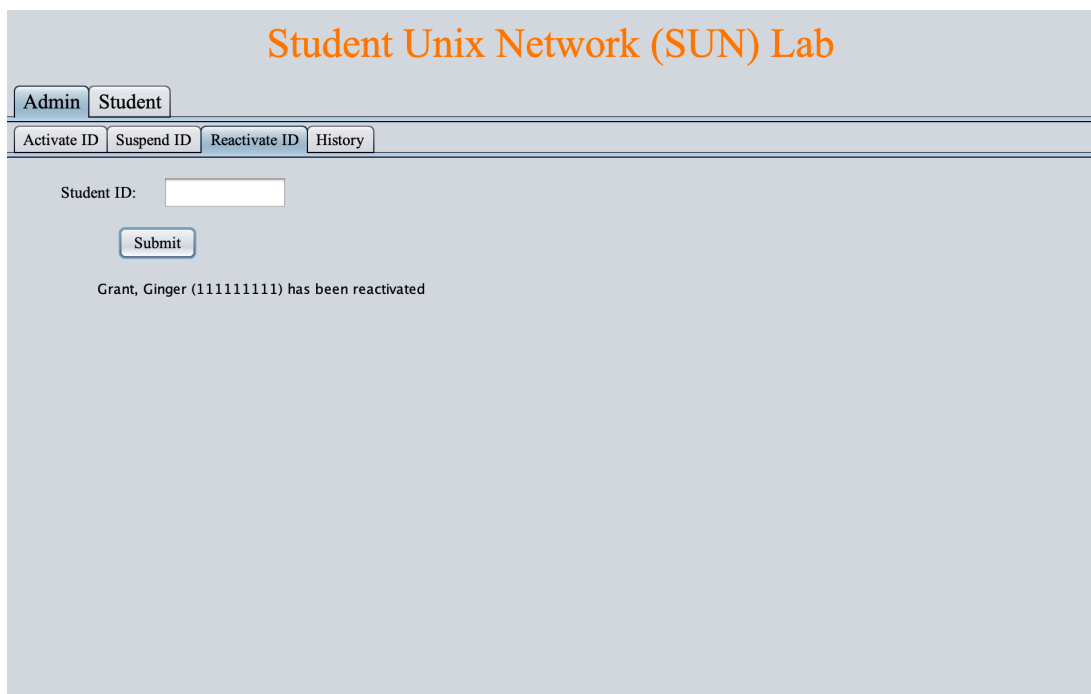
Reactivating a Student ID

To reactivate a student ID, the Admin must navigate to the “Reactivate ID” tab. Once there, the user will see a blank text box. To reactivate an ID, the user must input a student ID of a student with a currently suspended ID.



The screenshot shows the 'Student Unix Network (SUN) Lab' interface. At the top, there are two tabs: 'Admin' and 'Student'. Below these, there are four sub-tabs: 'Activate ID', 'Suspend ID', 'Reactivate ID', and 'History'. The 'Reactivate ID' tab is currently selected. In the main area, there is a label 'Student ID:' followed by a text input box containing the value '111111111'. Below the input box is a 'Submit' button.

Once the student ID is inputted, the user must click “Submit” to reactivate a student’s ID. A message with the student’s ID, and the corresponding name, will appear, saying the student’s ID was reactivated.



The screenshot shows the same 'Student Unix Network (SUN) Lab' interface. The 'Reactivate ID' tab is still selected. The text input box is now empty. Below the 'Submit' button, a message has appeared: 'Grant, Ginger (111111111) has been reactivated'.

If the inputted student ID is currently activated or reactivated, then a message telling the user will appear.

The screenshot shows the 'Student Unix Network (SUN) Lab' interface. At the top, there is a title bar with the text 'Student Unix Network (SUN) Lab' in orange. Below the title bar, there are two tabs: 'Admin' and 'Student'. Under the 'Student' tab, there are four buttons: 'Activate ID', 'Suspend ID', 'Reactivate ID', and 'History'. The 'Activate ID' button is currently selected. Below the buttons, there is a form with a label 'Student ID:' followed by a text input field containing the value '111111111'. Below the input field is a 'Submit' button.



The screenshot shows the 'Student Unix Network (SUN) Lab' interface. At the top, there is a title bar with the text 'Student Unix Network (SUN) Lab' in orange. Below the title bar, there are two tabs: 'Admin' and 'Student'. Under the 'Student' tab, there are four buttons: 'Activate ID', 'Suspend ID', 'Reactivate ID', and 'History'. The 'Activate ID' button is currently selected. Below the buttons, there is a form with a label 'Student ID:' followed by a text input field. Below the input field is a 'Submit' button. Below the 'Submit' button, there is a message that reads 'Student already has an activated ID'.

If the inputted student ID does not match any student ID in the system, then a message tells the user the student does not exist in the system.

Student Unix Network (SUN) Lab

Admin Student

Activate ID Suspend ID Reactivate ID History

Student ID:



Student Unix Network (SUN) Lab

Admin Student

Activate ID Suspend ID Reactivate ID History

Student ID:

Student not found

History of SUN Lab Access

If the Admin wants to see who has accessed the SUN Lab, the user must navigate to the “History” tab. Before the user has browsed or searched the history, this is displayed.

The screenshot shows the 'Student Unix Network (SUN) Lab' interface. At the top, there are two tabs: 'Admin' and 'Student'. Below them, there are four sub-tabs: 'Activate ID', 'Suspend ID', 'Reactivate ID', and 'History'. The 'History' tab is currently selected. Below the sub-tabs, there is a 'Sort by:' label followed by a dropdown menu showing '- Select One -' and a 'Sort' button. Below the dropdown menu, there is a table with three columns: 'Student', 'Student ID', and 'Timestamp'. The table is currently empty.

The bottom drop-down box (“—”) has no options until a choice is selected from the top drop-down box (“- Select One -”). The choices are “Student ID”, “Date”, and “Time Range”.

This screenshot is similar to the previous one, but the dropdown menu for 'Sort by:' is open. It shows three options: 'Student ID', 'Date', and 'Time Range'. The table below remains empty.

When the user selects “Descending” then clicks “Sort”, all students are displayed in the table, sorted by student ID in descending order.

Student Unix Network (SUN) Lab

Admin
Student

Activate ID
Suspend ID
Reactivate ID
History

Sort by:

Student ID

Sort

Descending

▼

Student	Student ID	Timestamp
u, t	88	2024-09-22 12:26:26.083
u, t	88	2024-09-22 12:26:18.132
Grumby, Jonas	444444444	2024-09-22 17:06:22.601
Grumby, Jonas	444444444	2024-09-22 17:06:02.032
r, w	44	2024-09-22 12:25:09.524
Howell, Thurston	333333333	2024-09-22 17:06:26.61
Howell, Thurston	333333333	2024-09-22 17:05:23.903
Summers, Mary Ann	222222222	2024-09-22 17:05:04.517
Summers, Mary Ann	222222222	2024-09-22 17:05:00.946
Grant, Ginger	111111111	2024-09-22 17:06:16.35
Grant, Ginger	111111111	2024-09-22 17:04:33.627
a, a	1	2024-09-15 14:52:30.742
a, a	1	2024-09-15 14:52:30.089

IMPORTANT NOTE: To increase expandability, the student ID type is a string, meaning the student ID can be made up of numbers or letters. The examples only use numbers, but in the future, if it is more optimal for each student ID to consist of letters and numbers, the system can handle the switch for new students without needing to be updated.

History: Date Sort

Next, we will see how the choice “Date” is implemented. When the user clicks, “Date” from the top drop-down box, the bottom drop-down box fills with two choices: “Most Recent” and “Oldest”.

The screenshot shows the 'Student Unix Network (SUN) Lab' interface. At the top, there are tabs for 'Admin' and 'Student'. Below these are buttons for 'Activate ID', 'Suspend ID', 'Reactivate ID', and 'History'. The 'Sort by:' section has a dropdown menu set to 'Date'. Below this, a second dropdown menu is open, showing 'Most Recent' (highlighted) and 'Oldest'. A 'Sort' button is also present. The table below is empty, with headers 'Student', 'Student ID', and 'Timestamp'.

When the user selects “Most Recent”, then clicks “Sort”, all the students are displayed in the table, sorted from the most recent to the oldest dates of the timestamp.

The screenshot shows the 'Student Unix Network (SUN) Lab' interface. The 'Sort by:' section has a dropdown menu set to 'Date'. Below it, the second dropdown menu is set to 'Most Recent'. The 'Sort' button is highlighted. The table below is populated with student data, sorted by timestamp from most recent to oldest.

Student	Student ID	Timestamp
Howell, Thurston	33333333	2024-09-22 17:06:26.61
Grumby, Jonas	44444444	2024-09-22 17:06:22.601
Grant, Ginger	11111111	2024-09-22 17:06:16.35
Grumby, Jonas	44444444	2024-09-22 17:06:02.032
Howell, Thurston	33333333	2024-09-22 17:05:23.903
Summers, Mary Ann	22222222	2024-09-22 17:05:04.517
Summers, Mary Ann	22222222	2024-09-22 17:05:00.946
Grant, Ginger	11111111	2024-09-22 17:04:33.627
u, t	88	2024-09-22 12:26:26.083
u, t	88	2024-09-22 12:26:18.132
r, w	44	2024-09-22 12:25:09.524
a, a	1	2024-09-15 14:52:30.742
a, a	1	2024-09-15 14:52:30.089

When the user selects “Oldest”, then clicks “Sort”, all the students are displayed in the table, sorted from the oldest to the most recent dates of the timestamp.

Student Unix Network (SUN) Lab

AdminStudent

Activate IDSuspend IDReactivate IDHistory

Sort by:

Date

Sort

Oldest

Student	Student ID	Timestamp
a, a	1	2024-09-15 14:52:30.089
a, a	1	2024-09-15 14:52:30.742
r, w	44	2024-09-22 12:25:09.524
u, t	88	2024-09-22 12:26:18.132
u, t	88	2024-09-22 12:26:26.083
Grant, Ginger	111111111	2024-09-22 17:04:33.627
Summers, Mary Ann	222222222	2024-09-22 17:05:00.946
Summers, Mary Ann	222222222	2024-09-22 17:05:04.517
Howell, Thurston	333333333	2024-09-22 17:05:23.903
Grumby, Jonas	444444444	2024-09-22 17:06:02.032
Grant, Ginger	111111111	2024-09-22 17:06:16.35
Grumby, Jonas	444444444	2024-09-22 17:06:22.601
Howell, Thurston	333333333	2024-09-22 17:06:26.61

History: Time Range Sort

Finally, we will see how the choice “Time Range” is implemented. When the user clicks, “Time Range” from the top drop-down box, the bottom drop-down box fills with three choices: “Year”, “Month”, and “Day”.

The screenshot shows the 'Student Unix Network (SUN) Lab' interface. At the top, there are tabs for 'Admin' and 'Student'. Below these are buttons for 'Activate ID', 'Suspend ID', 'Reactivate ID', and 'History'. The main area has a 'Sort by:' label with a dropdown menu set to 'Time Range' and a 'Sort' button. The dropdown menu is open, showing three options: 'Year', 'Month', and 'Day'. Below the dropdown is a table with columns 'Student', 'Student ID', and 'Timestamp'. The table is currently empty.

When year is selected, two new drop-down boxes appear (From: “- Select Year -” and to: “- Select Year -”). The choices of these drop-down boxes are the past 5 years and the current year. Since the system deletes any entries that are older than 5 years, the drop-down boxes only give year choices that can exist in the database. Since this is 2024, the only choices are “2024”, “2023”, “2022”, “2021”, “2020”, and “2019”.

The screenshot shows the 'Student Unix Network (SUN) Lab' interface. At the top, there are tabs for 'Admin' and 'Student'. Below these are buttons for 'Activate ID', 'Suspend ID', 'Reactivate ID', and 'History'. The main area has a 'Sort by:' label with a dropdown menu set to 'Time Range' and a 'Sort' button. The dropdown menu is open, showing three options: 'Year', 'Month', and 'Day'. Below the dropdown is a table with columns 'Student' and 'Student ID'. The table is currently empty. To the right of the table, there are two dropdown menus labeled 'From:' and 'to:'. The 'From:' dropdown is set to '- Select Year -' and the 'to:' dropdown is also set to '- Select Year -'. The 'to:' dropdown menu is open, showing a list of years: 2024, 2023, 2022, 2021, 2020, and 2019.

When the user selects a choice for each drop-down box, then clicks “Sort”, only the students with timestamps within the time range, including the years selected will display. From there, the students are listed chronologically. For the example, we’ll first choose From: 2024 to: 2024.

Student Unix Network (SUN) Lab

Admin Student

Activate ID Suspend ID Reactivate ID History

Sort by: Time Range Sort

Year From: 2024 to: 2024

Student	Student ID	Timestamp
a, a	1	2024-09-15 14:52:30.089
a, a	1	2024-09-15 14:52:30.742
r, w	44	2024-09-22 12:25:09.524
u, t	88	2024-09-22 12:26:18.132
u, t	88	2024-09-22 12:26:26.083
Grant, Ginger	111111111	2024-09-22 17:04:33.627
Summers, Mary Ann	222222222	2024-09-22 17:05:00.946
Summers, Mary Ann	222222222	2024-09-22 17:05:04.517
Howell, Thurston	333333333	2024-09-22 17:05:23.903
Grumby, Jonas	444444444	2024-09-22 17:06:02.032
Grant, Ginger	111111111	2024-09-22 17:06:16.35
Grumby, Jonas	444444444	2024-09-22 17:06:22.601
Howell, Thurston	333333333	2024-09-22 17:06:26.61
Grant, Ginger	111111111	2024-09-22 18:19:18.331
Grant, Ginger	111111111	2024-09-22 18:22:05.421
Grumby, Jonas	444444444	2024-09-22 18:12:33.506

Since the current database has no entries for 2022 to 2023, if we choose these options for the example, there will be no entries in the table.

Student Unix Network (SUN) Lab

Admin Student

Activate ID Suspend ID Reactivate ID History

Sort by: Time Range Sort

Year From: 2022 to: 2023

Student	Student ID	Timestamp
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When the user selects the months and years, then clicks “Sort”, the table will display all the entries with timestamps that are within the range, including the start and end dates. For the example, we’ll use from February 2023 (2/2023) to September 2024 (9/2024).

Student Unix Network (SUN) Lab

Admin
Student

Activate ID
Suspend ID
Reactivate ID
History

Sort by: Time Range

Sort

Month ▼

From: 2 2023

to: 9 2024

Student	Student ID	Timestamp
a, a	1	2024-09-15 14:52:30.089
a, a	1	2024-09-15 14:52:30.742
r, w	44	2024-09-22 12:25:09.524
u, t	88	2024-09-22 12:26:18.132
u, t	88	2024-09-22 12:26:26.083
Grant, Ginger	111111111	2024-09-22 17:04:33.627
Summers, Mary Ann	222222222	2024-09-22 17:05:00.946
Summers, Mary Ann	222222222	2024-09-22 17:05:04.517
Howell, Thurston	333333333	2024-09-22 17:05:23.903
Grumby, Jonas	444444444	2024-09-22 17:06:02.032
Grant, Ginger	111111111	2024-09-22 17:06:16.35
Grumby, Jonas	444444444	2024-09-22 17:06:22.601
Howell, Thurston	333333333	2024-09-22 17:06:26.61
Grant, Ginger	111111111	2024-09-22 18:19:18.331
Grant, Ginger	111111111	2024-09-22 18:22:05.421
Grumby, Jonas	444444444	2024-09-22 18:22:22.506

When the user selects “Day”, six drop-down boxes (From: “- Select Day -”, “- Select Month -”, and “- Select Year - ” and to: “- Select Day -”, “- Select Month -”, and “- Select Year - ”) will appear in addition to the two original drop-down boxes with a message prompting the user to first select a month and year. The choices for the “- Select Month -” drop-down boxes are the 12 numeric representations for the months. The choices for the “- Select Year -” are the last 5 years and the current year. After a month and year are selected, the “- Select Day -” drop-down boxes fill with choices for all the possible days in the chosen month (ex. if the user chooses 2 (February) and 2023 for the From: month and year, the choices for From: “- Select Day- ” will be from 1 to 28, while 2 (February) and 2024 would display choices from 1 to 29).

[illegible]

When the user selects a From : day, month, and year, and a to: day, month, and year, then clicks “Sort” all the entries with timestamps within the range, including the start and end dates, are displayed in the table. For the first example, we’ll use April 4, 2023 (4/4/2023) to September 15, 2024 (9/15/2024). Only two entries are shown in the table because these are the only entries from within this range.

Student Unix Network (SUN) Lab

Admin Student

Activate ID Suspend ID Reactivate ID History

Sort by: Time Range

Day

Sort

Please select a month and year first

From: 4

to: 15

4

9

2024

2024

Student	Student ID	Timestamp
a, a	1	2024-09-15 14:52:30.089
a, a	1	2024-09-15 14:52:30.742

To further illustrate the “Day” choice, we’ll show another example to show all entries from a specific day. To find all the entries from a specific day, make the start and end dates equal. In this example we’ll use September 22, 2024 (9/22/2024) to September 22, 2024 (9/22/2024).

Student Unix Network (SUN) Lab

Admin Student

Activate ID Suspend ID Reactivate ID History

Sort by: Time Range

Day

Sort

Please select a month and year first

From: 22

to: 22

9

9

2024

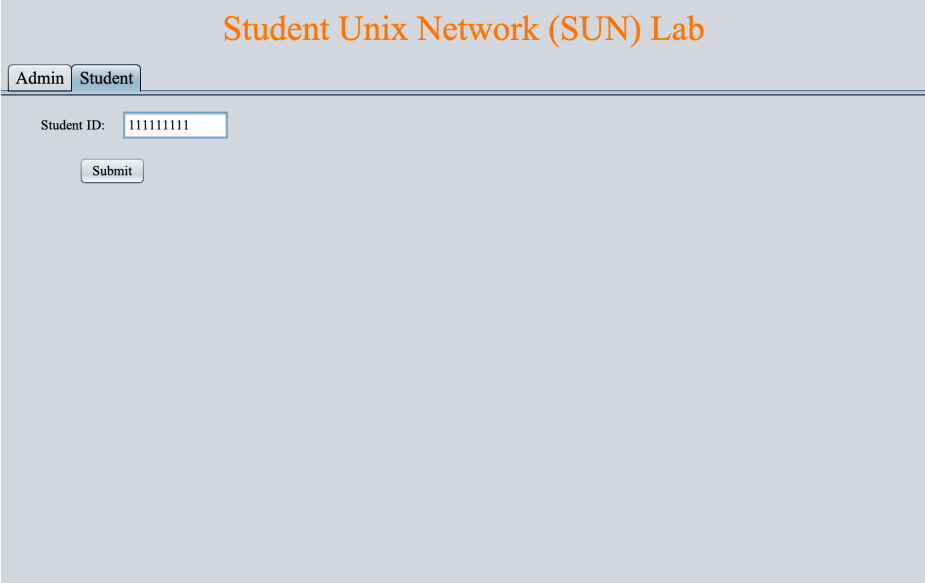
2024

Student	Student ID	Timestamp
r, w	44	2024-09-22 12:25:09.524
u, t	88	2024-09-22 12:26:18.132
u, t	88	2024-09-22 12:26:26.083
Grant, Ginger	111111111	2024-09-22 17:04:33.627
Summers, Mary Ann	222222222	2024-09-22 17:05:00.946
Summers, Mary Ann	222222222	2024-09-22 17:05:04.517
Howell, Thurston	333333333	2024-09-22 17:05:23.903
Grumby, Jonas	444444444	2024-09-22 17:06:02.032
Grant, Ginger	111111111	2024-09-22 17:06:16.35
Grumby, Jonas	444444444	2024-09-22 17:06:22.601
Howell, Thurston	333333333	2024-09-22 17:06:26.61
Grant, Ginger	111111111	2024-09-22 18:19:18.331
Grant, Ginger	111111111	2024-09-22 18:22:05.421
Grumby, Jonas	444444444	2024-09-22 19:13:22.506

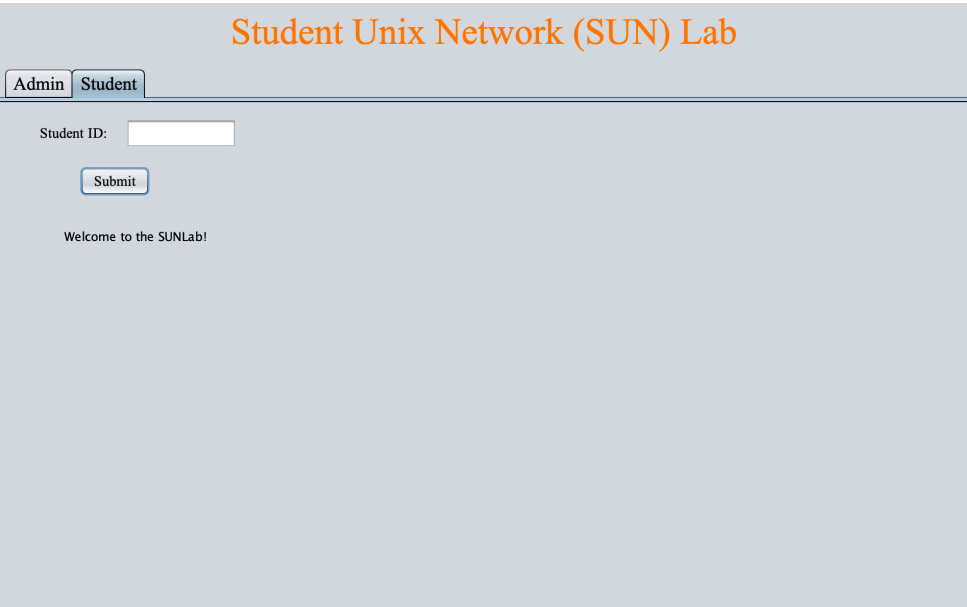
Student Tab

The system has two tabs at the top: “Admin” and “Student”. Previously, we have only seen the implementation of the “Admin”, which will only be used by an authorized person. The “Student” tab is to be used by students. The purpose of this tab is to both emulate students swiping their cards to access the SUN Lab and to show the system can be extended in the future to support multiple users. When navigating to this tab, the user will see a text box to enter a student ID. Entering a student ID is meant to simulate a student swiping their card to enter and exit the SUN Lab.

When a student with an activated or reactivated ID inputs their ID into the text box to enter the SUN Lab, a message welcomes them to the SUN Lab.

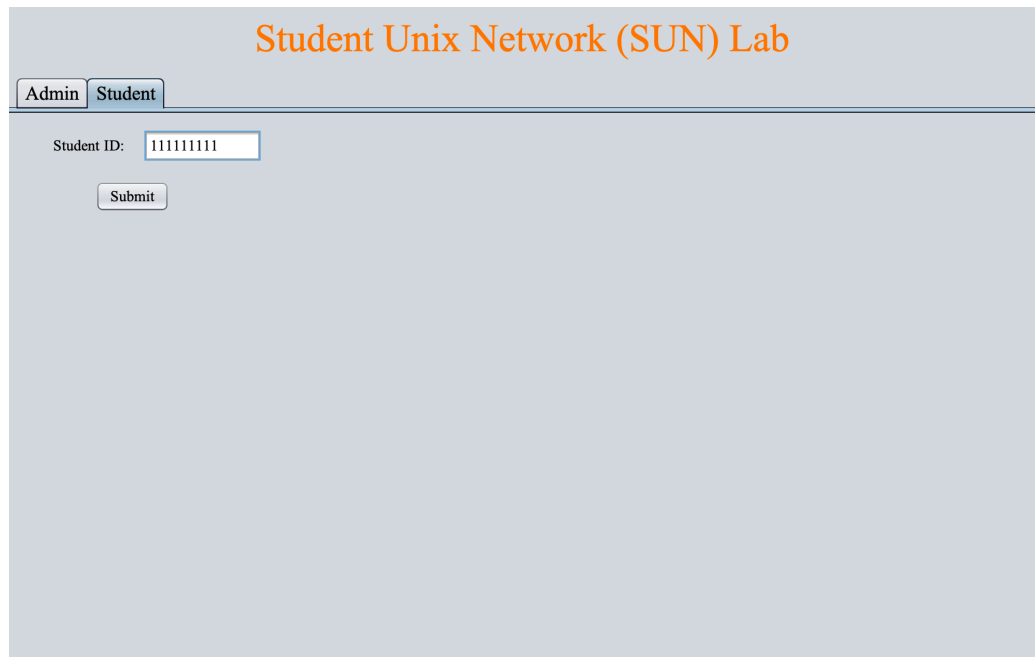


The screenshot shows the "Student Unix Network (SUN) Lab" interface. At the top, there are two tabs: "Admin" and "Student", with "Student" being the active tab. Below the tabs, there is a label "Student ID:" followed by a text input field containing the value "11111111". Below the input field is a "Submit" button.



The screenshot shows the "Student Unix Network (SUN) Lab" interface after a successful login. The "Student" tab is still selected. The "Student ID:" label is now followed by an empty text input field. Below the input field is a "Submit" button. At the bottom of the form area, the message "Welcome to the SUNLab!" is displayed.

When a student inputs their ID into the text box to exit the SUN Lab, a message wishes them a nice day.

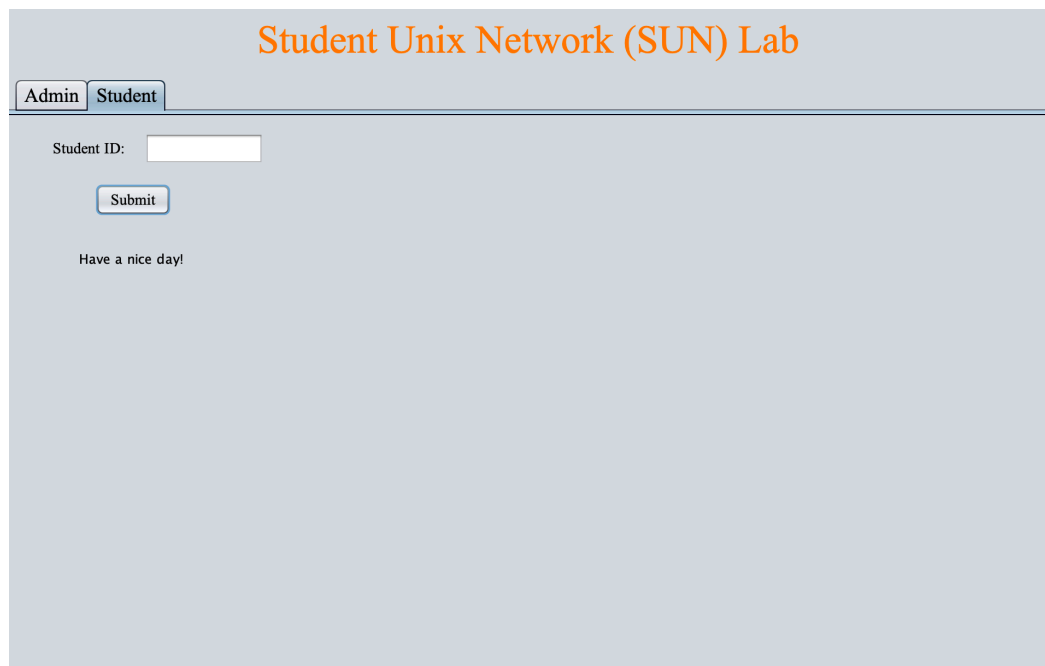


Student Unix Network (SUN) Lab

Admin Student

Student ID:

Submit



Student Unix Network (SUN) Lab

Admin Student

Student ID:

Submit

Have a nice day!

If a suspended student or a student not in the system tries to access the SUN Lab by inputting their student ID, a message will appear telling the student they do not have access to the SUN Lab.

The diagram illustrates the process of a student attempting to access the SUN Lab. It consists of two screenshots of the 'Student Unix Network (SUN) Lab' interface, connected by a large yellow downward-pointing arrow.

Top Screenshot: The interface has a title bar 'Student Unix Network (SUN) Lab' in orange. Below it are two tabs: 'Admin' and 'Student'. The 'Student' tab is active. A form labeled 'Student ID:' contains the text '222222222'. Below the input field is a 'Submit' button.

Bottom Screenshot: The interface is identical to the top one, but the 'Student ID' input field is now empty. Below the 'Submit' button, a message is displayed: 'You do not have access to the SUNLab'.

If a student is suspended while they are in the SUN Lab, they will be given temporary access so they can exit the SUN Lab. After exiting, the student's ID will be suspended and they will not be able to reenter the SUN Lab.