

Nguyễn Trần Hoàng Hạ - ITITIU21127

HOMEWORK EXERCISES

Exercises 5: Search Functionality

Test Cases

Search Term	Expected Results	
"John"	Shows all students with "John" in name	Passed
"SV001"	Shows student with code SV001	Passed
"science"	Shows students in Computer Science/Data Science	Not passed because the require is Add search capability to find students by name or code
"" (empty)	Shows all students	Passed

5.1: Create Search Form

The screenshot shows a web-based student management system. At the top left is a logo of a person with glasses. Next to it, the text "Student Management System" is displayed. Below the header, there is a search bar with the placeholder "Search by name or code..." and two buttons: "Search" (blue) and "Clear" (white). Underneath the search bar is a button labeled "+ Add New Student". The main area features a table listing five students:

ID	Student Code	Full Name	Email	Major	Created At	Actions
5	SV005	David Wilson	david.w@email.com	Computer Science	2025-11-08 14:18:26.0	
4	SV004	Sarah Davis	sarah.d@email.com	Data Science	2025-11-08 14:18:26.0	
3	SV003	Michael Brown	michael.b@email.com	Software Engineering	2025-11-08 14:18:26.0	
2	SV002	Emily Johnson	emily.j@email.com	Info	2025-11-08 14:18:26.0	
1	SV001	John Smith	john.smith@email.com	Computer Science	2025-11-08 14:18:26.0	

5.2: Implement Search Logic (12 points)

Student Management System

Search Clear

+ Add New Student

ID	Student Code	Full Name	Email	Major	Created At	Actions
3	SV003	Michael Brown	michael.b@email.com	Software Engineering	2025-11-08 14:18:26.0	 Edit  Delete

Bonus (+2 points): Highlight search term in results

Student Management System

Search Clear

+ Add New Student

ID	Student Code	Full Name	Email	Major	Created At	Actions
5	SV005	David Wilson	david.w@email.com	Computer Science	2025-11-08 14:18:26.0	 Edit  Delete

Student Management System

Search Clear

+ Add New Student

ID	Student Code	Full Name	Email	Major	Created At	Actions
5	SV005	David Wilson	david.w@email.com	Computer Science	2025-11-08 14:18:26.0	 Edit  Delete

Student Management System

Search Clear

+ Add New Student

ID	Student Code	Full Name	Email	Major	Created At	Actions
2	SV002	Emily Johnson	emily.j@email.com	Info	2025-11-08 14:18:26.0	 Edit  Delete
1	SV001	John Smith	john.smith@email.com	Computer Science	2025-11-08 14:18:26.0	 Edit  Delete

Student Management System						
Search						
+ Add New Student						
ID	Student Code	Full Name	Email	Major	Created At	Actions
1	SV001	John Smith	john.smith@email.com	Computer Science	2025-11-08 14:18:26.0	Edit Delete

Student Management System						
Search by name or code...						
+ Add New Student						
ID	Student Code	Full Name	Email	Major	Created At	Actions
5	SV005	David Wilson	david.w@email.com	Computer Science	2025-11-08 14:18:26.0	Edit Delete
4	SV004	Sarah Davis	sarah.d@email.com	Data Science	2025-11-08 14:18:26.0	Edit Delete
3	SV003	Michael Brown	michael.b@email.com	Software Engineering	2025-11-08 14:18:26.0	Edit Delete
2	SV002	Emily Johnson	emily.j@email.com	Info	2025-11-08 14:18:26.0	Edit Delete
1	SV001	John Smith	john.smith@email.com	Computer Science	2025-11-08 14:18:26.0	Edit Delete

EXERCISE 6: VALIDATION ENHANCEMENT (10 points)

6.1: Email Validation (5 points)

Test Cases:

Email Input	Expected Result	
john@email.com	Valid, accepts	Passed
john.doe@company.co.uk	Valid, accepts	Passed
john@email	Invalid, rejects	Passed
johnemail.com	Invalid, rejects	
(empty)	Valid, accepts (optional field)	Passed

10	DA111	HA NGUYEN	john.doe@company.co.uk	CV	2025-11-17 21:49:54.0	Edit Delete
9	SV008	Nguyễn Trần Hoàng Hạ	john@email.com	Software Engineering	2025-11-17 21:48:55.0	Edit Delete

+ Add New Student

Student Code *

SV059

Full Name *

Nguyễn Trần Hoàng Hà

Email

john@email

Major

CV

 Save Student

Cancel

+ Add New Student

Invalid email format

Student Code *

e.g., SV001

Full Name *

Enter full name

Email

student@email.com

Major

e.g., Computer Science

 Save Student

Cancel

+ Add New Student

Student Code *

Full Name *

Email

Major

 Save StudentCancel

+ Add New Student

Student Code *

Full Name *

Email

Major Please include an '@' in the email address. 'johnemail.com' is missing an '@'.

 Save StudentCancel

ID	Student Code	Full Name	Email	Major	Created At	Actions
12	DA118	Nguyen Tran Hoang Ha		CV	2025-11-17 21:59:08.0	Edit Delete

6.2: Student Code Pattern Validation (5 points)

Examples: SV001, IT123, CS9999 (valid)

Examples: sv001, S001, SV12 (invalid)

Student Code *

sv001

Full Name *

Nguyen Tran Hoang Ha

Email

student@email.com

Major

e.g., Computer Science

 Save Student

Cancel

Student Code *

S001

Full Name *

HA NGUYEN

Student Code *

SV12

Full Name *

Ha

+ Add New Student

Invalid student code format (e.g., SV001, IT123)

Student Code *

Full Name *

Enter full name

Email

student@email.com

Major

e.g., Computer Science

 Save Student

Cancel

EXERCISE 7: USER EXPERIENCE IMPROVEMENTS (15 points)

7.1: Pagination (8 points)

Add pagination to display 10 students per page.

ID	Student Code	Full Name	Email	Major	Created At	Actions
30	SV099	HA NGUYEN			2025-11-17 22:52:54.0	Edit Delete
29	SV080	Nguyễn Trần Hoàng Hạ			2025-11-17 22:52:45.0	Edit Delete
28	SV089	Nguyễn Trần Hoàng Hạ			2025-11-17 22:52:37.0	Edit Delete
27	SV011	Nguyễn Trần Hoàng Hạ			2025-11-17 22:52:29.0	Edit Delete
26	SV110	Nguyễn Trần Hoàng Hạ			2025-11-17 22:52:08.0	Edit Delete
25	SV009	Nguyen Tran Hoang Ha			2025-11-17 22:52:03.0	Edit Delete
24	SV008	Nguyen Tran Hoang Ha			2025-11-17 22:51:57.0	Edit Delete
23	SV002	Nguyen Tran Hoang Ha			2025-11-17 22:51:50.0	Edit Delete
22	SV001	Nguyễn Trần Hoàng Hạ			2025-11-17 22:51:42.0	Edit Delete
21	SV003	Nguyễn Trần Hoàng Hạ			2025-11-17 22:51:32.0	Edit Delete

1 2 Next

7.2: Improved UI/UX (7 points)

a) Success/Error Message Styling (2 points)

Student Management System

✓ Student added successfully

Search by name or code...

Search

Clear

b) Loading States (2 points)

+ Add New Student

Student Code *

Full Name *

Email

Major

Processing...

Cancel

c) Responsive Table (3 points)



Student Management System

SearchClear[+ Add New Student](#)

ID	Student Code	Full Name	Email	Major	Created At	Actions
39	SV118	Nguyễn Trần Hoàng Hạ			2025-11-17 23:11:45.0	Edit Delete
38	SV098	Nguyễn Trần Hoàng Hạ			2025-11-17 23:10:37.0	Edit Delete
35	SV191	HA NGUYEN			2025-11-17 23:07:29.0	Edit Delete
34	SV044	HA NGUYEN			2025-11-17 23:06:35.0	Edit Delete
33	SV051	Nguyễn Trần Hoàng Hạ			2025-11-17 23:06:15.0	Edit Delete
31	DA111	HA NGUYEN			2025-11-17 23:05:55.0	Edit Delete
30	SV099	HA NGUYEN			2025-11-17 22:52:54.0	Edit Delete
29	SV080	Nguyễn Trần Hoàng Hạ			2025-11-17 22:52:45.0	Edit Delete
28	SV089	Nguyễn Trần Hoàng Hạ			2025-11-17 22:52:37.0	Edit Delete
27	SV011	Nguyễn Trần Hoàng Hạ			2025-11-17 22:52:29.0	Edit Delete

1 2 Next

BONUS EXERCISES

BONUS 1: Export to CSV (5 points)

		+ Add New Student	Export to CSV			
ID	Student Code	Full Name	Email	Major	Created At	Actions
45	DA141	Nguyễn Trần Hoàng HẠ	nguyentranhoangha03@gmail.com		2025-11-17 23:24:43.0	Edit Delete
44	SV111	ha	nthha.iuswt@gmail.com		2025-11-17 23:24:14.0	Edit Delete
43	SV980	HA NGUYEN	nguyentranhoangha03@gmail.com		2025-11-17 23:19:29.0	Edit Delete
42	SV096	Nguyễn Trần Hoàng HẠ	nthha.iuswt@gmail.com		2025-11-17 23:18:30.0	Edit Delete
41	SV022	Nguyen Tran Hoang Ha	nguyentranhoangha03@gmail.com		2025-11-17 23:16:58.0	Edit Delete
39	SV118	Nguyễn Trần Hoàng HẠ	nthha.iuswt@gmail.com		2025-11-17 23:11:45.0	Edit Delete
38	SV098	Nguyễn Trần Hoàng HẠ	nguyentranhoangha03@gmail.com		2025-11-17 23:10:37.0	Edit Delete
35	SV191	HA NGUYEN	nthha.iuswt@gmail.com		2025-11-17 23:07:29.0	Edit Delete
34	SV044	HA NGUYEN	nthha.iuswt@gmail.com		2025-11-17 23:06:35.0	Edit Delete
33	SV051	Nguyễn Trần Hoàng HẠ	nthha.iuswt@gmail.com		2025-11-17 23:06:15.0	Edit Delete

ID	Student Code	Full Name	Email	Major
33	SV051	Nguyễn Trần Hoàng HẠ	nthha.iuswt@gmail.com	
34	SV044	HA NGUYEN	nthha.iuswt@gmail.com	
35	SV191	HA NGUYEN	nthha.iuswt@gmail.com	
38	SV098	Nguyễn Trần Hoàng HẠ	nguyentranhoangha03@gmail.com	
39	SV118	Nguyễn Trần Hoàng HẠ	nthha.iuswt@gmail.com	
41	SV022	Nguyen Tran Hoang Ha	nguyentranhoangha03@gmail.com	
42	SV096	Nguyễn Trần Hoàng HẠ	nthha.iuswt@gmail.com	
43	SV980	HA NGUYEN	nguyentranhoangha03@gmail.com	
44	SV111	ha	nthha.iuswt@gmail.com	IT
45	DA141	Nguyễn Trần Hoàng HẠ	nguyentranhoangha03@gmail.com	Software Engineering

BONUS 2: Sort by Column (5 points)

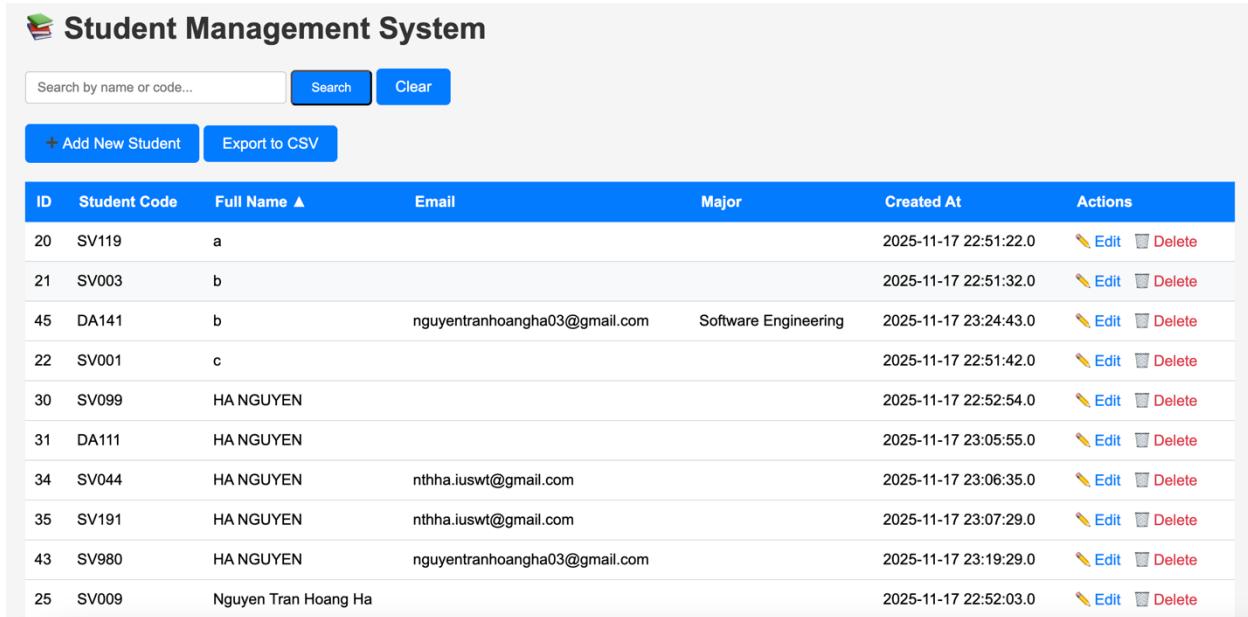
Add ability to sort table by clicking column headers.

Toggle ascending/descending

Requirements:

- Click "Full Name" header → sort alphabetically

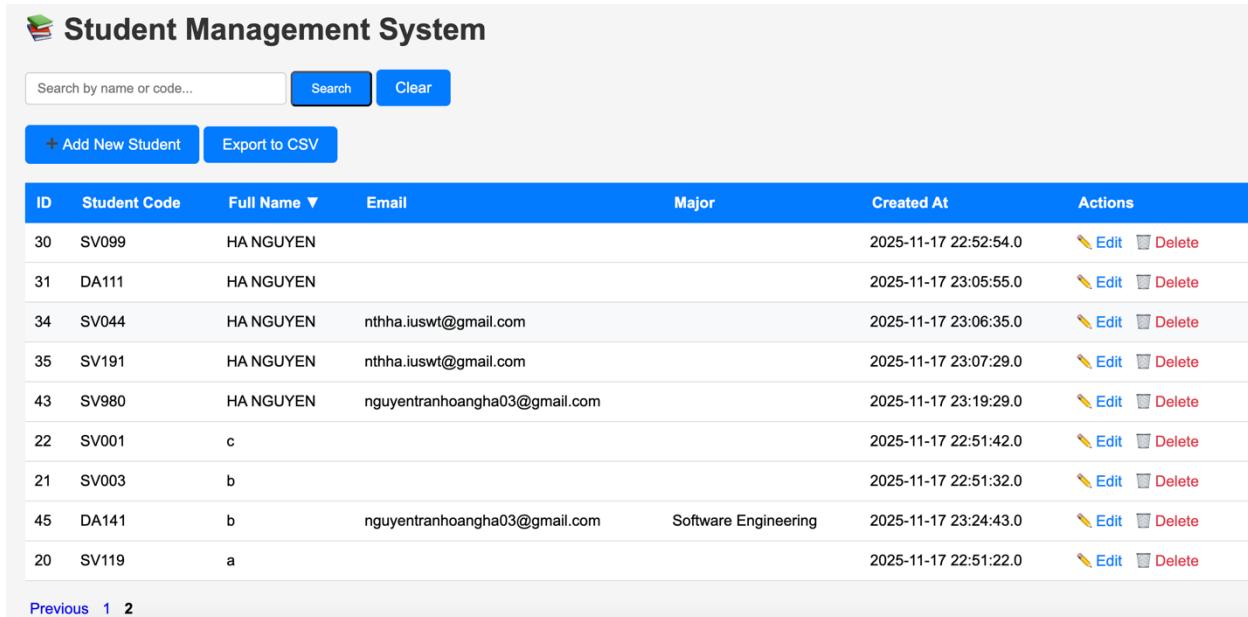
Increasing



The screenshot shows a Student Management System interface. At the top, there is a search bar with placeholder text "Search by name or code...", a "Search" button, and a "Clear" button. Below the search bar are two buttons: "+ Add New Student" and "Export to CSV". The main area is a table with the following columns: ID, Student Code, Full Name, Email, Major, Created At, and Actions. The data is sorted by Full Name in ascending order. The table contains the following rows:

ID	Student Code	Full Name	Email	Major	Created At	Actions
20	SV119	a			2025-11-17 22:51:22.0	
21	SV003	b			2025-11-17 22:51:32.0	
45	DA141	b	nguyentranoangha03@gmail.com	Software Engineering	2025-11-17 23:24:43.0	
22	SV001	c			2025-11-17 22:51:42.0	
30	SV099	HA NGUYEN			2025-11-17 22:52:54.0	
31	DA111	HA NGUYEN			2025-11-17 23:05:55.0	
34	SV044	HA NGUYEN	nthha.iuswt@gmail.com		2025-11-17 23:06:35.0	
35	SV191	HA NGUYEN	nthha.iuswt@gmail.com		2025-11-17 23:07:29.0	
43	SV980	HA NGUYEN	nguyentranoangha03@gmail.com		2025-11-17 23:19:29.0	
25	SV009	Nguyen Tran Hoang Ha			2025-11-17 22:52:03.0	

Descreasing



The screenshot shows the same Student Management System interface, but the data is sorted by Full Name in descending order. The table structure and data points are identical to the increasing order table above, with the exception of the sorting direction indicated by the downward arrow icon in the Full Name column header.

ID	Student Code	Full Name	Email	Major	Created At	Actions
30	SV099	HA NGUYEN			2025-11-17 22:52:54.0	
31	DA111	HA NGUYEN			2025-11-17 23:05:55.0	
34	SV044	HA NGUYEN	nthha.iuswt@gmail.com		2025-11-17 23:06:35.0	
35	SV191	HA NGUYEN	nthha.iuswt@gmail.com		2025-11-17 23:07:29.0	
43	SV980	HA NGUYEN	nguyentranoangha03@gmail.com		2025-11-17 23:19:29.0	
22	SV001	c			2025-11-17 22:51:42.0	
21	SV003	b			2025-11-17 22:51:32.0	
45	DA141	b	nguyentranoangha03@gmail.com	Software Engineering	2025-11-17 23:24:43.0	
20	SV119	a			2025-11-17 22:51:22.0	

Previous 1 2

- Click "Created At" → sort by date

Increasing

Student Management System						
Search by name or code...		Search	Clear			
+ Add New Student		Export to CSV				
ID	Student Code	Full Name	Email	Major	Created At ▲	Actions
20	SV119	a			2025-11-17 22:51:22.0	Edit Delete
21	SV003	b			2025-11-17 22:51:32.0	Edit Delete
22	SV001	c			2025-11-17 22:51:42.0	Edit Delete
23	SV002	Nguyen Tran Hoang Ha			2025-11-17 22:51:50.0	Edit Delete
24	SV008	Nguyen Tran Hoang Ha			2025-11-17 22:51:57.0	Edit Delete
25	SV009	Nguyen Tran Hoang Ha			2025-11-17 22:52:03.0	Edit Delete
26	SV110	Nguyễn Trần Hoàng HẠ			2025-11-17 22:52:08.0	Edit Delete
27	SV011	Nguyễn Trần Hoàng HẠ			2025-11-17 22:52:29.0	Edit Delete
28	SV089	Nguyễn Trần Hoàng HẠ			2025-11-17 22:52:37.0	Edit Delete
29	SV080	Nguyễn Trần Hoàng HẠ			2025-11-17 22:52:45.0	Edit Delete

Descreasing

Student Management System						
Search by name or code...		Search	Clear			
+ Add New Student		Export to CSV				
ID	Student Code	Full Name	Email	Major	Created At ▼	Actions
45	DA141	b	nguyentranhoangha03@gmail.com	Software Engineering	2025-11-17 23:24:43.0	Edit Delete
43	SV980	HA NGUYEN	nguyentranhoangha03@gmail.com		2025-11-17 23:19:29.0	Edit Delete
42	SV096	Nguyễn Trần Hoàng HẠ	nthha.iuswt@gmail.com		2025-11-17 23:18:30.0	Edit Delete
41	SV022	Nguyen Tran Hoang Ha	nguyentranhoangha03@gmail.com		2025-11-17 23:16:58.0	Edit Delete
39	SV118	Nguyễn Trần Hoàng HẠ	nthha.iuswt@gmail.com		2025-11-17 23:11:45.0	Edit Delete
38	SV098	Nguyễn Trần Hoàng HẠ	nguyentranhoangha03@gmail.com		2025-11-17 23:10:37.0	Edit Delete
35	SV191	HA NGUYEN	nthha.iuswt@gmail.com		2025-11-17 23:07:29.0	Edit Delete
34	SV044	HA NGUYEN	nthha.iuswt@gmail.com		2025-11-17 23:06:35.0	Edit Delete
33	SV051	Nguyễn Trần Hoàng HẠ	nthha.iuswt@gmail.com		2025-11-17 23:06:15.0	Edit Delete
31	DA111	HA NGUYEN			2025-11-17 23:05:55.0	Edit Delete

BONUS 3: Bulk Delete (5 points)

Add checkboxes to select multiple students and delete them at once.

Requirements:

- Checkbox for each student row

The screenshot shows a table of student records. Each row contains a checkbox in the first column, followed by the student's ID, code, full name, email, major, and creation date. To the right of the table is an 'Actions' column with 'Edit' and 'Delete' buttons for each student. At the top of the table, there is a header row with columns for ID, Student Code, Full Name, Email, Major, Created At, and Actions.

	ID	Student Code	Full Name	Email	Major	Created At	Actions
<input type="checkbox"/>	48	SV115	Chi			2025-11-22 11:15:15.0	
<input type="checkbox"/>	47	SV098	Dũng			2025-11-22 11:15:07.0	
<input type="checkbox"/>	46	SV015	Quỳnh			2025-11-22 11:14:48.0	
<input type="checkbox"/>	27	SV011	Nguyễn Trần Hoàng Hạ			2025-11-17 22:52:29.0	
<input type="checkbox"/>	26	SV110	Nguyễn Trần Hoàng Hạ			2025-11-17 22:52:08.0	
<input type="checkbox"/>	25	SV009	Nguyen Tran Hoang Ha			2025-11-17 22:52:03.0	
<input type="checkbox"/>	22	SV001	c			2025-11-17 22:51:42.0	
<input type="checkbox"/>	21	SV003	b			2025-11-17 22:51:32.0	
<input type="checkbox"/>	20	SV119	a			2025-11-17 22:51:22.0	

- "Select All" checkbox

The screenshot shows a table of student records, identical to the one above but with a 'Select All' checkbox added at the top left of the data area. This checkbox, when checked, selects all the rows in the table. The rest of the interface is the same, with search, export, and delete buttons at the top and an actions column at the bottom.

	ID	Student Code	Full Name	Email	Major	Created At	Actions
<input checked="" type="checkbox"/>	48	SV115	Chi			2025-11-22 11:15:15.0	
<input checked="" type="checkbox"/>	47	SV098	Dũng			2025-11-22 11:15:07.0	
<input checked="" type="checkbox"/>	46	SV015	Quỳnh			2025-11-22 11:14:48.0	
<input checked="" type="checkbox"/>	27	SV011	Nguyễn Trần Hoàng Hạ			2025-11-17 22:52:29.0	
<input checked="" type="checkbox"/>	26	SV110	Nguyễn Trần Hoàng Hạ			2025-11-17 22:52:08.0	
<input checked="" type="checkbox"/>	25	SV009	Nguyen Tran Hoang Ha			2025-11-17 22:52:03.0	
<input checked="" type="checkbox"/>	22	SV001	c			2025-11-17 22:51:42.0	
<input checked="" type="checkbox"/>	21	SV003	b			2025-11-17 22:51:32.0	
<input checked="" type="checkbox"/>	20	SV119	a			2025-11-17 22:51:22.0	

- "Delete Selected" button

- Confirmation before bulk delete

The screenshot shows a web browser window for the "Student Management System" at localhost:8080. A modal dialog box is centered over the page, displaying the message "localhost:8080 says" followed by "Are you sure to delete selected students?". Below the message are two buttons: "Cancel" and "OK". The main content area shows a table of student data with 10 rows. The first three rows have checkboxes checked in the first column, indicating they are selected for deletion. The table columns are: ID, Student Code, Full Name, Email, Major, and Created At. The Actions column contains edit and delete icons for each row.

	ID	Student Code	Full Name	Email	Major	Created At	Actions
<input checked="" type="checkbox"/>	48	SV115	Chi			2025-11-22 11:15:15.0	
<input checked="" type="checkbox"/>	47	SV098	Dũng			2025-11-22 11:15:07.0	
<input checked="" type="checkbox"/>	46	SV015	Quỳnh			2025-11-22 11:14:48.0	
<input type="checkbox"/>	27	SV011	Nguyễn Trần Hoàng Hà			2025-11-17 22:52:29.0	
<input type="checkbox"/>	26	SV110	Nguyễn Trần Hoàng Hà			2025-11-17 22:52:08.0	
<input type="checkbox"/>	25	SV009	Nguyen Tran Hoang Ha			2025-11-17 22:52:03.0	
<input type="checkbox"/>	22	SV001	c			2025-11-17 22:51:42.0	
<input type="checkbox"/>	21	SV003	b			2025-11-17 22:51:32.0	
<input type="checkbox"/>	20	SV119	a			2025-11-17 22:51:22.0	

* Delete few students

The screenshot shows the same web browser window after performing a bulk delete operation. A green success message bar at the top states "✓ 3 students deleted". The main content area shows the same table of student data, but now only the last seven rows are visible, indicating that the first three selected rows have been deleted. The table structure remains the same as in the previous screenshot.

	ID	Student Code	Full Name	Email	Major	Created At	Actions
<input type="checkbox"/>	27	SV011	Nguyễn Trần Hoàng Hà			2025-11-17 22:52:29.0	
<input type="checkbox"/>	26	SV110	Nguyễn Trần Hoàng Hà			2025-11-17 22:52:08.0	
<input type="checkbox"/>	25	SV009	Nguyen Tran Hoang Ha			2025-11-17 22:52:03.0	
<input type="checkbox"/>	22	SV001	c			2025-11-17 22:51:42.0	
<input type="checkbox"/>	21	SV003	b			2025-11-17 22:51:32.0	
<input type="checkbox"/>	20	SV119	a			2025-11-17 22:51:22.0	

* Delete all the students

Student Management System

✓ 6 students deleted

Search by name or code...

<input type="checkbox"/>	ID ▼	Student Code	Full Name	Email	Major	Created At	Actions
--------------------------	------	--------------	-----------	-------	-------	------------	---------