

Anoushka Jha  
anoushkajha1998@gmail.com  
Bihar, India

Timezone: Indian Standard Time (UTC+5:30)

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# Implement a Prototype of an Accessible Sortable Table

GSoC Project proposal for Kolibri

## **PERSONAL DETAILS & CONTACT INFORMATION :**

- **Full Name:** Anoushka Jha
- **University:** Indian Institute of Technology (BHU), Varanasi
- **Date of Enrollment:** November 2021
- **Expected Graduation date:** July 2025
- **Degree:** Bachelor of Technology
- **Email Address:** [anoushkajha1998@gmail.com](mailto:anoushkajha1998@gmail.com)  
[anoushka.jha.che21@itbhu.ac.in](mailto:anoushka.jha.che21@itbhu.ac.in)
- **Github Username:** <https://github.com/BabyElias>
- **Phone Number:** 9508046061

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## **SYNOPSIS**

The Kolibri Design System contains resources for designers and developers building Kolibri products. With inclusivity at the heart of Learning Equality's mission, the purpose of KDS is to reduce the time it takes to design & build products while ensuring accessibility, responsiveness, and cross-browser compatibility.

Currently, Data tables in Kolibri and Studio are implemented using CoreTable and SortableHeader components. However, this implementation does not support adding sorting functionality to the tables, which is one of the most common tools for data management. Sorting helps arrange data meaningfully to make it easier to understand, compare, and visualize. Also, using these components leaves too much to the developer to ensure accessibility across all user sections. This project aims to develop a new KDS component, a sortable table to provide a solution to these problems.

## **BENEFITS TO THE COMMUNITY**

The purpose of this project is to create a new KDS component, **KSortableTable**.

The features of this component will be -

- Provide an easy-to-use, standard sortable experience
- Meet best practices for screen reader accessibility
- Ensure best-practice keyboard navigation throughout
- Support internationalization
- Have easy reusability across all Kolibri and KDP products

## EXPECTED RESULTS

This is a sample code representation of the expected final, ready-to-use component.



```
<template>
<KSortableTable selected="true" :emptyMessage="emptyMessage"
  :dataLoading="dataLoading"
  :tableProps="{
    hover: true,
  }"
  header
  footer
  :items="items"
  :columns="columns"
  columnFilter
  :default="{column: 'fullname', state: 'asc'}"
  :content="tableInfo"
>

</KSortableTable>
</template>
```

where,

**Columns** - corresponds to the array of objects containing name, custom styling, and sorting options

**Items** - corresponds to the array of objects containing information about data to be filled in individual rows





*NOTE: There might be more components between the KSortableTable opening and closing tags, which are not shown in the image above.*

```
columns: [  
  {  
    key: 'avatar',  
    ariaLabel: 'avatar',  
    filter: false,  
    sorter: false,  
  },  
  {  
    key: 'Full Name',  
    _style: { width: '20%' },  
  },  
  {  
    key: 'Birth Year',  
    _style: { width: '20%' }  
  },  
  {  
    key: 'Date Added',  
    _style: { width: '20%' }  
  },  
  {  
    key: 'Progress',  
    label: '',  
    _style: { width: '1%' },  
    filter: false,  
    sorter: false,  
  },  
],
```

Representation of Data in columns

```
items: [
  {
    id: 1,
    name: 'User 1',
    avatar: '1.jpg',
    username: 'user1',
    birth: '2004'
    dateAdded: '2022/01/01',
    progress: '100',
  }
]
```

Representation of Data in rows (Items)

	Full Name ▼	UserName ⇅	Birth Year ⇅	Date Added ⇅	Progress ⇅
<input type="checkbox"/>	 <input type="text"/>	<input type="text"/>	<input type="text" value="2004"/>	<input type="text" value="X Days ago"/>	<div><div></div></div> 100%
<input type="checkbox"/>	 <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<div><div></div></div> 75%
<input type="checkbox"/>	 <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
<input type="checkbox"/>	 <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	

Sample design of the table we aim to create with this code.

# APPROACH

In order to implement KSortable table with proper accessibility and internationalization standards, I plan to move forward in a phase-wise approach wherein we first ensure the accessibility and responsiveness of the component and then move forward with internationalization and UI enhancements.

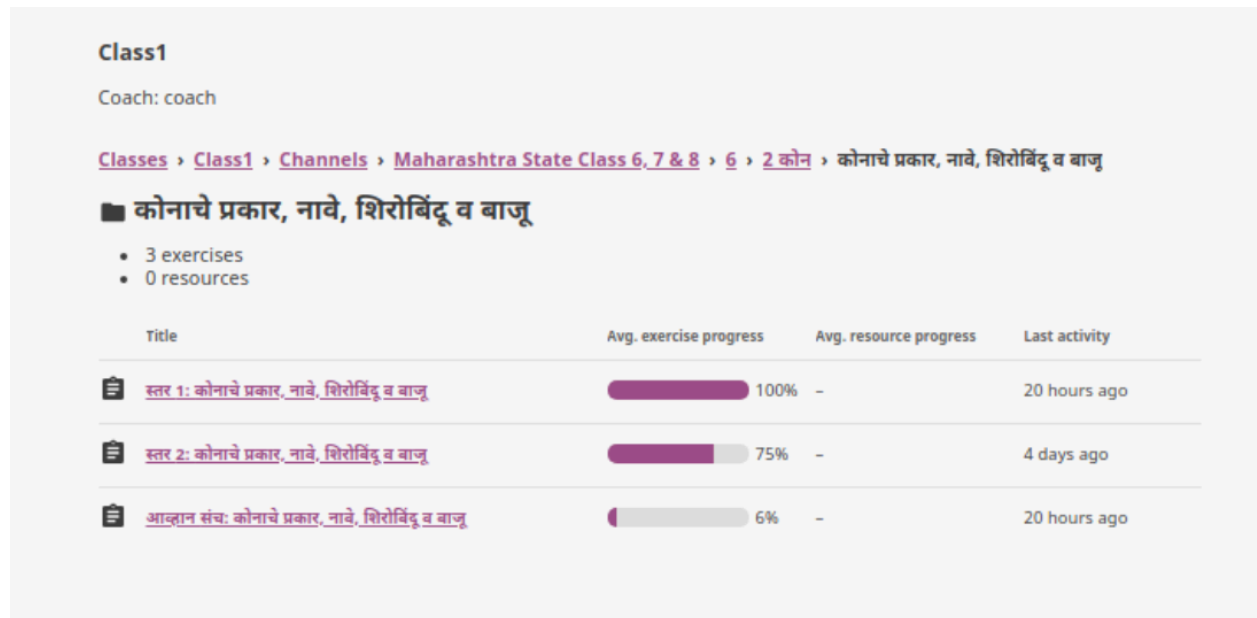
## PHASE I - ACCESSIBILITY & RESPONSIVENESS

### STEP 1 :

- ❖ Determine use cases for sortable tables
- ❖ Determine all possible data types, their alignment in a table cell
- ❖ their sorting criteria (and whether, they should be considered for sorting or not), &
- ❖ suitable aria-labels for screen-reader accessibility for these different data types.

Some possible use cases of these tables (in Kolibri and Studio) can be seen as :







- Coach Reports - Lessons



The screenshot shows a web interface for 'Class1' with a coach named 'coach'. It displays a breadcrumb trail: 'Classes > Class1 > Channels > Maharashtra State Class 6, 7 & 8 > 6 > 2 कोन > कोनाचे प्रकार, नावे, शिरोबिंदू व बाजू'. Below this is a section titled 'कोनाचे प्रकार, नावे, शिरोबिंदू व बाजू' with 3 exercises and 0 resources. A table follows with columns: Title, Avg. exercise progress, Avg. resource progress, and Last activity. The table lists three exercises with their respective progress bars and last activity times.

Title	Avg. exercise progress	Avg. resource progress	Last activity
स्तर 1: कोनाचे प्रकार, नावे, शिरोबिंदू व बाजू	100%	-	20 hours ago
स्तर 2: कोनाचे प्रकार, नावे, शिरोबिंदू व बाजू	75%	-	4 days ago
आज्ञान संच: कोनाचे प्रकार, नावे, शिरोबिंदू व बाजू	6%	-	20 hours ago

- Coach Reports - Learners

Learners						
LESSONS	QUIZZES	GROUPS	LEARNERS			
Name	Groups	Exercises completed	Resources viewed	Average quiz score	Last activity	 
 <a href="#">Carine</a>	Blue group	3	5	45%	2 hours ago	
 <a href="#">David</a>	Green group	4	9	59%	5 hours ago	
 <a href="#">Ivan</a>	Red group	2	3	65%	1 month ago	
 <a href="#">Jamie</a>	Green group	5	8	80%	2 years ago	

- Coach Reports- Quizzes

LESSONS

QUIZZES

GROUPS

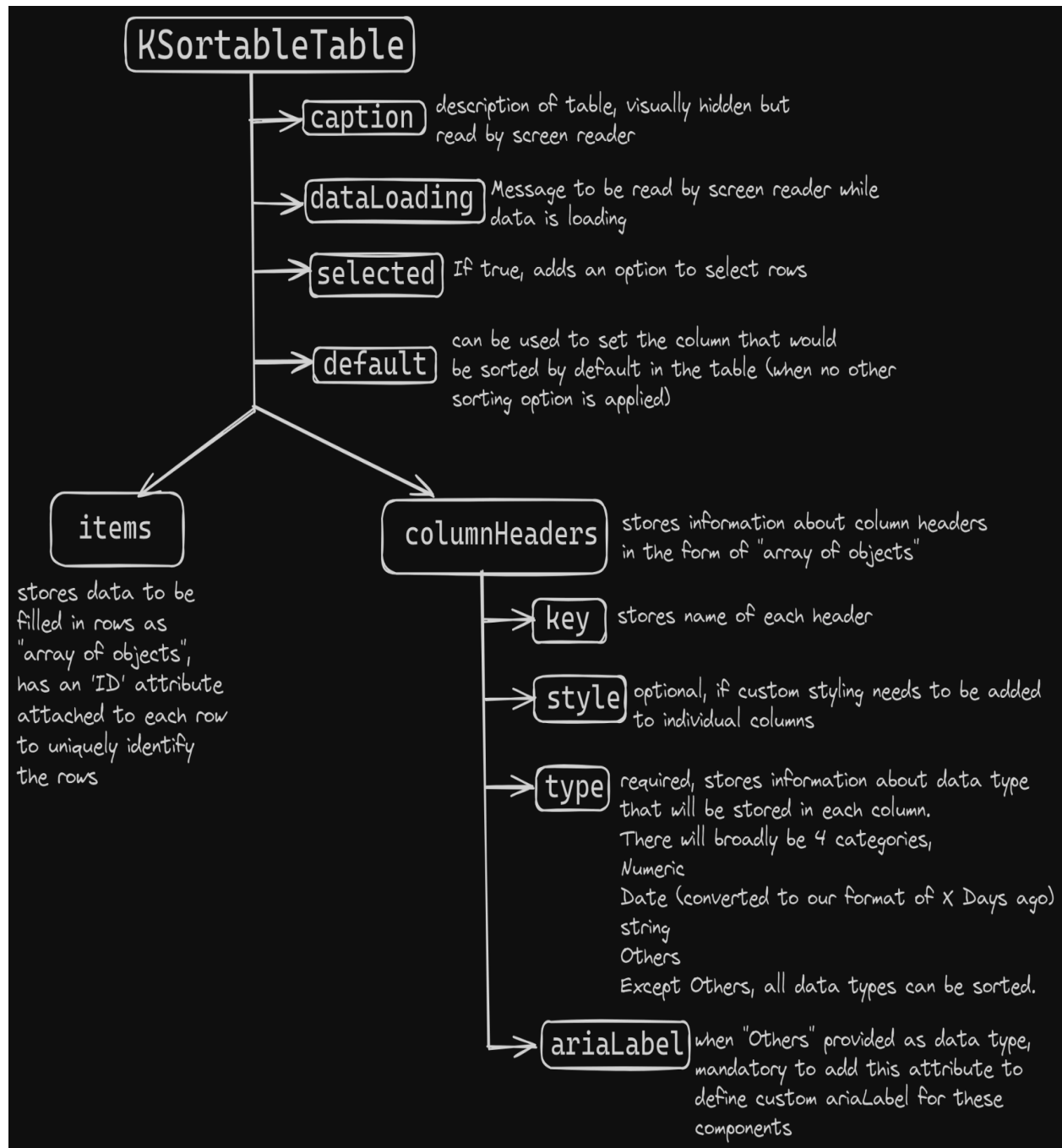
LEARNERS

Title	<div> <div></div> <div>Average score</div> <div></div> </div>	Progress	Receipient	Status
<div></div> <a href="#">Geography - Term 1</a>	59%	<div> <div></div> <div>Completed by 8 of 30</div> <div>22 haven't started</div> </div>	Entire class	Quiz ended
<div></div> <a href="#">Mathematics - Term 1 (Fractions, Decimals, Algebra)</a>	62%	<div> <div></div> <div>Completed by 12 of 30</div> <div>22 haven't started</div> </div>	Entire class	Quiz ended



## STEP 2:

- ❖ Based on Step 1, implement KSortableTable component for a basic "column header" only table as :



### STEP 3:

- ❖ Use only semantic HTML elements for table implementation to ensure accessibility.
- ❖ Add aria-labelling for screen-reader accessibility to this table, as :
  - Use **scope="col"** with each th tag
  - Add **aria-sort** labels, that will be toggled by **aria-pressed** actions
  - Add separate aria-label features for custom data types (described by *Others*)
- ❖ Add Responsiveness to the table by creating scroll bars for movement. Here, we can have the traditional scroll movement OR
  - Make the first column sticky and others scrollable, if row-wise identification of information by values stored in the first column is important and the table is lengthy. For eg : A Students Table with first name, last name & marks in all subjects. Here, first name - last name column can be made sticky while others are scrollable.

## **PHASE 2 - INTERNATIONALIZATION & UI ENHANCEMENTS**

### STEP 4:

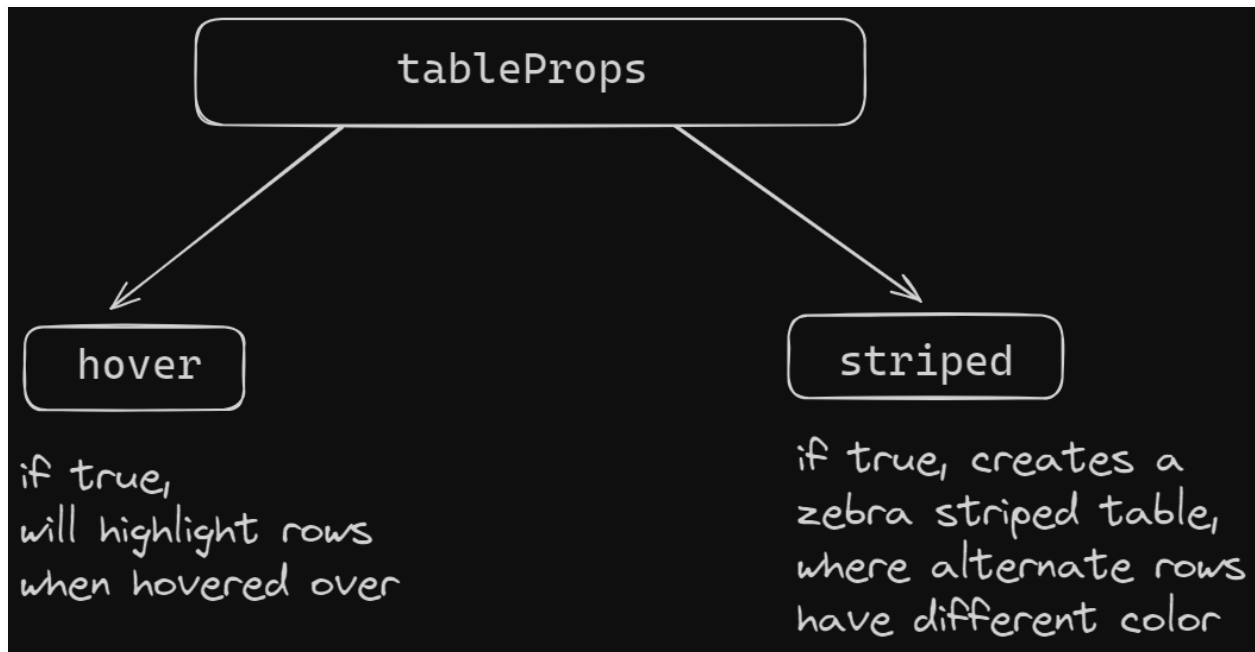
- ❖ Add internationalization standards to the KSortableTable component by defining messages in the `<script>` section as attributes of the component definition.
- ❖ Use RTL property wherever needed.

### STEP 5:

- ❖ Add support for table with both row & column headers.
- ❖ Enhance screen reader accessibility by defining aria-labeling as both **id & headers** for each td element.

STEP 6:

- ❖ Add options for custom UI to the table as :



- ❖ Add smooth animation for table sorting, to enhance visual appeal.

EXTENDED GOALS:

- ❖ Configure Table filter and Pagination features.

## **TIMELINE & DELIVERABLES**

	PERIOD	TASK
MILESTONE 1	After proposal submission [April 2 - May 26]	<ul style="list-style-type: none"> <li>• Research all table use cases and determine a one-fit component for all.</li> <li>• Also, read more about accessibility and internationalization standards suited to our needs. (Step 1)</li> <li>• Try out basic implementation methods for KSortableTable</li> </ul>
	Week 1 and 2 [May 29 - June 10]	<ul style="list-style-type: none"> <li>• Implement KSortableTable for column header only tables. (Step 2)</li> </ul>
	Week 3 and 4 [June 11 - June 25]	<ul style="list-style-type: none"> <li>• Add aria-labelling and responsiveness to the component. (Step 3)</li> </ul>
MILESTONE 2	Week 5 and 6 [June 26 - July 8]	BUFFER
	Week 7 and 8 [July 9 - July 23]	<ul style="list-style-type: none"> <li>• Add internationalization standards.(Step 4)</li> </ul>
	Week 9 and 10 [July 24 - Aug 7]	<ul style="list-style-type: none"> <li>• Add support for table with both row &amp; column headers. (Step 5)</li> </ul>
	Week 11 and 12 [Aug 8 - Aug 22]	<ul style="list-style-type: none"> <li>• Add options for custom UI. (Step 6)</li> </ul>

## ADDITIONAL INFORMATION

### About Me :



Hey!

This is Anoushka Jha (or BabyElias >< ) , a pre-final yearite from the Indian Institute Of Technology (BHU), Varanasi, India. I am a frontend web developer proficient in HTML, CSS, JavaScript & VueJS along with experience in working with ReactJS, NextJS & Nuxt. I love exploring new technologies & contributing to the Open-Source community, making a positive difference with my code.

Apart from this, I enjoy dancing and listening to music in my free time :)

### Skills :

Skill Name	Proficiency (1-5)
HTML	4
CSS	4.5
VueJS	4
Git/Github	4.5
ReactJS/NextJS/Nuxt	3.5

*Previous Contributions to Learning Equality :*

ISSUE TITLE	LINK TO ISSUE AND/OR PR	ADDITIONAL NOTES
KRouterLink to Studio: Replace <router-link> in Studio with <KRouterLink>	<a href="#">Issue</a> <a href="#">PR 1</a> <a href="#">PR 2</a> <a href="#">PR 3</a>	[Merged]
KRadioButton redundant v-model/value	<a href="#">Issue</a> <a href="#">PR</a>	[Merged]
Remove 3rd party GH action from the changelog workflow	<a href="#">Issue</a> <a href="#">PR</a>	[Merged]
Refactor Icon to use KIcon instead of VIcon	<a href="#">Issue</a>	[Work in Progress]
Broken "develop" branch link	<a href="#">Issue</a> <a href="#">PR</a>	[Merged]
The yarn dev-only misspelled in 01_getting_started.md	<a href="#">Issue</a> <a href="#">PR</a>	[Merged]

### Why Learning Equality ?

The equity-driven values. The idea that drives Learning Equality. The work culture, the sections of the community they target, and the entire ideology that runs this organisation.

My idea of technology has always been to put it to use where it can positively impact the lives of people who really need it. And Learning Equality truly aligns with all of it. Throughout these few months that I have worked with Learning Equality, it has been one of my most cherishable Open-Source contribution experiences so far. The entire community, from maintainers to fellow contributors, is all so welcoming and willing to help. It makes me happy to be part of a team that shares equal enthusiasm and motivation towards creating a more equitable society as me :)

### Plans after GSoC :

GSoC or not, I would love to continue contributing to Learning Equality and give my little contribution to anything that I can do to help bridge the digital gap that exists around us.

### Other Commitments:

I do not have any other plans and commitments this summer except GSoC. I'll have my mid-semester exams somewhere in the month of July, the dates of which have not been announced yet. However, I have allotted a week of buffer period at half the GSoC coding period to meet these commitments.

THANK YOU!