



## Product requirements

### User Stories [↗](#)

As a	I want to	So that	Prioritization	Func/non-func	Link
Student	Instantly get the Parsons Problems by select the topic	Can improve the efficiency of practice and get a large number of different exercises.	Must have	Functional	FUS-1
	Easily select the topic and content of the Parsons Problems	Can get personalized questions based on my data analysis learning needs.	Must have	Functional	FUS-2
	Solve the problem via the same web app or generate new ones	Can test my understanding of a topic by doing practice questions.	Must have	Functional	FUS-3
	Receive immediate feedback after rearranging the blocks of code	Can understand if my solution is correct or if I need to make adjustments.	Must have	Functional	FUS-4
	The system to record how long I spend answering each Parsons Problem	Can track my progress and improve my time management skills	Must have	Functional	FUS-5
	The Interface easy to use	Can give better experience in practice process without struggling to navigate the application	Must have	Non-functional	NFUS-1
	Display correctly on any device screen.	Can have an optimal user experience	Optional	Non-functional	NFUS-2

	My test correctness to be secure to ensure my privacy and safety while using the web	Can guarantee my information security and personal privacy	Must have	Non-functional	NFUS-3
	I want the site to maintain a consistent visual style, so that it looks professional and cohesive.	Can have an consistent view of the site	Optional	Non-functional	NFUS-4
Admin	I want to securely log in and log out to the system	Can access the admin dashboard	Must have	Functional	FUS-6
	View all activities of students	Know performance of students	Must have	Functional	FUS-7
	I need to ensure my privacy and safety while using the web	Can guarantee my information security and personal privacy	Must have	Non-functional	NFUS-3
	I want the site to maintain a consistent visual style, so that it looks professional and cohesive.	Can have an consistent view of the site	Optional	Non-functional	NFUS-4

## Function Requirements [↗](#)

Requirements	User Stories	Importance	Implementation
<b>AI-Generated Problems: Use AI to generate/regenerate Parsons problems based on selected topics and contexts.</b>	<b>FUS-1:</b> As a student, I want to instantly get the Parsons Problems by select the topic.	High	<ul style="list-style-type: none"> <li>AI Model: Utilize an AI model (e.g., Llama AI or Gemini API) to generate code snippets for Parsons problems.</li> <li>API Integration: Implement an API to interact with the AI model for generating problems.</li> </ul>

<b>Topic Selection: Users can choose topics and contexts relevant to their learning needs.</b>	<b>FUS-2:</b> As a student, I want to easily select the topic and content of the Parsons Problems.	High	<ul style="list-style-type: none"> <li>• Frontend: Create a user interface for selecting topics and contexts.</li> </ul>
<b>Drag-and-Drop Interface: Allow users to reorder code blocks using drag-and-drop functionality.</b>	<b>FUS-3:</b> As a student, I want to solve the problem by dragging and dropping code blocks into the correct order.	High	<ul style="list-style-type: none"> <li>• Front-end: Use JavaScript libraries (e.g., React DnD) to implement drag-and-drop functionality.</li> </ul>
<b>Solution Evaluation: Provide immediate feedback like common interpreter/IDE .</b>	<b>FUS-4:</b> As a student, I want to receive immediate feedback after rearranging the blocks of code.	High	<ul style="list-style-type: none"> <li>• Evaluation Logic: Implement backend logic to evaluate the correctness of reordered code.</li> <li>• Front-end: Display feedback</li> </ul>
<b>Time Tracking: Record the time spent on each problem.</b>	<b>FUS-5:</b> As a student, I want to the system to record how long I spend answering each Parsons Problem.	High	<ul style="list-style-type: none"> <li>• Database: Store timestamps for problem start and end times.</li> <li>• Cookies: Temporarily store timestamps to track progress even if the session is interrupted.</li> </ul>
<b>Admin Login: Secure access to the admin dashboard.</b>	<b>FUS-6:</b> As an admin, I want to securely log in to the system to access the admin dashboard.	High	<ul style="list-style-type: none"> <li>• Implement a login page/pop-up windows specifically for admins.</li> <li>• Include authentication mechanisms such as username and password validation.</li> <li>• Ensure secure handling and storage of admin credentials (e.g., hashed passwords).</li> <li>• Implement session management to keep the admin logged in for a specified duration or until they log out.</li> </ul>
<b>Admin Data Analytics: Display student</b>	<b>FUS-7:</b> As an admin, I want to view a dashboard that provides	High	<ul style="list-style-type: none"> <li>• Database: Store and aggregate data on student performance.</li> </ul>

<b>progress and performance.</b>	an overview of student performance, including questions completed, accuracy, and time spent on each topic.		<ul style="list-style-type: none"> <li>• Frontend: Develop a dashboard that displays the aggregated data in a user-friendly format.</li> <li>• Analytics: Implement visualizations such as charts and graphs to present the data effectively.</li> </ul>
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## Non-functional requirements

Requirements	User Stories	Importance	Implementation
<b>Intuitive Navigation:</b> Ensure the interface is clean and easy to navigate.	<b>NFUS-1:</b> As a user, I want to the Interface easy to use.	High	<ul style="list-style-type: none"> <li>• Frontend Framework: Use a modern frontend framework (e.g., React, Vue.js) to build the UI.</li> <li>• Usability Testing: Conduct usability tests to ensure the interface meets user needs.</li> </ul>
<b>Responsive Design(optional):</b> Optimize the UI for various devices (desktops, tablets, and mobile).	<b>NFUS-2:</b> As a user, I want the app to display correctly on any device screen.	Mid	<ul style="list-style-type: none"> <li>• CSS Framework: Implement responsive design using CSS frameworks (e.g., Bootstrap, Tailwind CSS).</li> </ul>
<b>Privacy</b>	<b>NFUS-3:</b> As a user, I want my test correctness to be secure to ensure my privacy and safety while using the web.	High	<ul style="list-style-type: none"> <li>• All data transmission will be over HTTPS, never display test score.</li> </ul>
<b>Consistent visual style</b>	<b>NFUS-4:</b> As a user, I want the site to maintain a consistent visual style, so that it looks professional and cohesive.	High	Maintain consistent color schemes, fonts, and layouts across the site.