TABLE OF CONTENTS

Part 1: Observation

1. Introduction:

Dyslexia:

Dyslexia is a learning disorder that involves difficulty reading due to problems identifying speech sounds and learning how they relate to letters and words. Also called reading disability, dyslexia affect areas of the brain that process language. People with dyslexia have normal intelligence and usually have normal vision. Most children with dyslexia can succeed in school with tutoring or a specialized education program. Emotional support also plays an important role.

Signs of dyslexia can be difficult to recognize before your child enters school, but some early clues may indicate a problem. Severity varies, but the condition often becomes apparent as a child starts learning to read. Signs that a young child may be at risk of dyslexia include:

➢ Late talking

➢ Learning new words slowly

➢ Problems forming words correctly, such as reversing sounds in words or confusing words that sound alike

➢ Problems remembering or naming letters, numbers and colours

➢ Difficulty learning nursery rhymes or playing rhyming games

Dyscalculia:

Dyscalculia is a condition that makes it hard to do math and tasks that involve math. It's not as well known or as understood as dyslexia. But some experts believe it's just as common. That means an estimated 5 to 10 percent of people might have dyscalculia

School-aged kids with dyscalculia may find it hard to:

➢ Estimate things, like how long something takes or the ceiling height
➢ Understand math word problems
➢ Learn basic math, like addition, subtraction, and multiplication
➢ Link a number (1) to its corresponding word (one)
➢ Understand fractions
➢ Understand graphs and charts (visual-spatial concepts)
➢ Count money or make change
➢ Remember phone numbers or ZIP codes
➢ Tell time or read clocks

2. Problem Definition:

In the world where people are surrounded by technology, the education sector have taken a leap and many E-Learning websites are emerging and developing online education culture. While building this website, many developers or entrepreneurs neglect the dyslexia and dyscalculia community. Humans are definitely filling a gap between education and technology but what about empathy? Hence, our website is targeting a community where students can learn mathematics at there own pace. We have tried to make the experience of learning comfortable and effortless. Students are hitched with technology and gadgets, so they might as well learn mathematics and get rid of the fear of learning.

Problem Statement:

"To Enhance the Learning Ability Of Dyslexia & Dyscalculia Students with The Help of Suitable Interface Design"

3. Interview Questions:

1. Which activity will encourage you more to retain information?
2. How does "ear reading" with audiobooks help students with dyslexia?
3. In what ways do students with dyslexia read differently?
4. Do reading problems and failure to keep pace stem from being lazy or unmotivated?
5. While understanding a concept, how many times do you need to practise problems?
6. How do you prefer to learn a concept? With your peers or at your own pace
7. Do colours help you to remember information?
8. What technology do these students need?
9. On an average, how many hours do you spend on a computer playing games?
10. How do cluttered, text-dense pages impact dyslexic students and is there a remedy?
11. Does competition make you nervous?
12. If your friend explains you the concept, how likely are you able to understand?
13. If you get a hold of the concept, does it motivate you to attempt difficult questions?
14. What kind of role does appreciation play in your learning journey?
15. Do you fear attempting any tests or exams?
16. How can you remember numbers, For e.g, 5 or Five?
17. How likely do shapes and objects help you to calculate numbers?
18. Do you think you have to refer to the basics of mathematical operations often?
19. Is there any instance where you have explained a concept differently and it actually had a solid impact?
20. If you are aware of a concept will you be able to teach it to your friend?

PART 2: IDEATION

Brainstorming:

1. Implementing game levels for solving complex problems.

2. Using Colours to Represent Units

3. Hints at every page so that the child can solve immediately.

4. A button to refer the solved examples page if the child forgets how to solve a sum.

5. Using Icons to demonstrate the buttons.

6. Using Shapes to represent the units.

7. Exercise problems at each level.

8. Excluding big paragraphs on the website.

9. Simple demonstration/ tutorial on the website for better learning.

10. The students can solve the problems at their own pace.

11. Variety of problems to practice including carry forward addition.

12. Appraisal Dialogue box to boost their moral after every correct solution provided by the students.
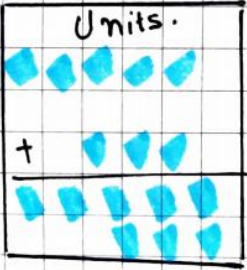
PART 3 : PROTOTYPE

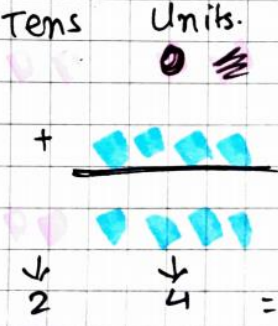## Wireframes:

Instructions:

One Hundred = 🟩   For eg. 500 = 🟩🟩🟩🟩🟩

One ten = 🟪   For eg 20 = 🟪🟪

One Unit = 🟦   For eg $4 = 🟦🟦🟦🟦

Single Digit Addition:

$5 + 3 =$

```
    5
  + 3
  ___
    8 =
```

Units.
🟦🟦🟦🟦
+ 🟦🟦🟦
🟦🟦🟦🟦🟦🟦🟦🟦

Double Digit Addition.

$20 + 4 =$

Tens   Units.
0   ≣

+ 🟦🟦🟦🟦
🟦🟦🟦🟦
↓   ↓
2   4 $= 24.$

Logo   ≡

CATEGORIES

ADDITION   SUBTRACTION

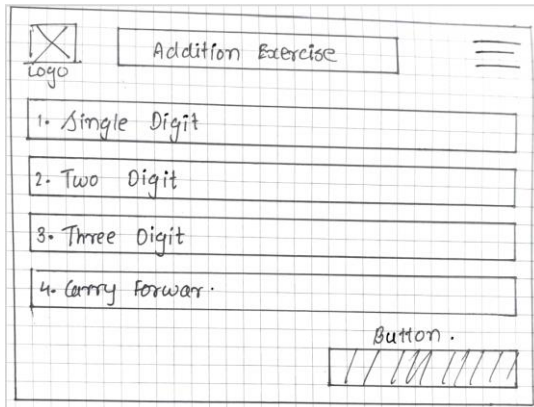MULTIPLICATION   DIVISION

SIGN UP
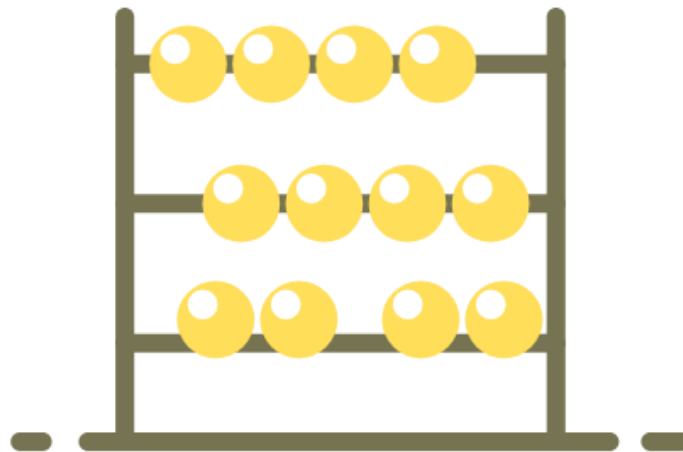
NAME

E-MAIL

PASSWORD

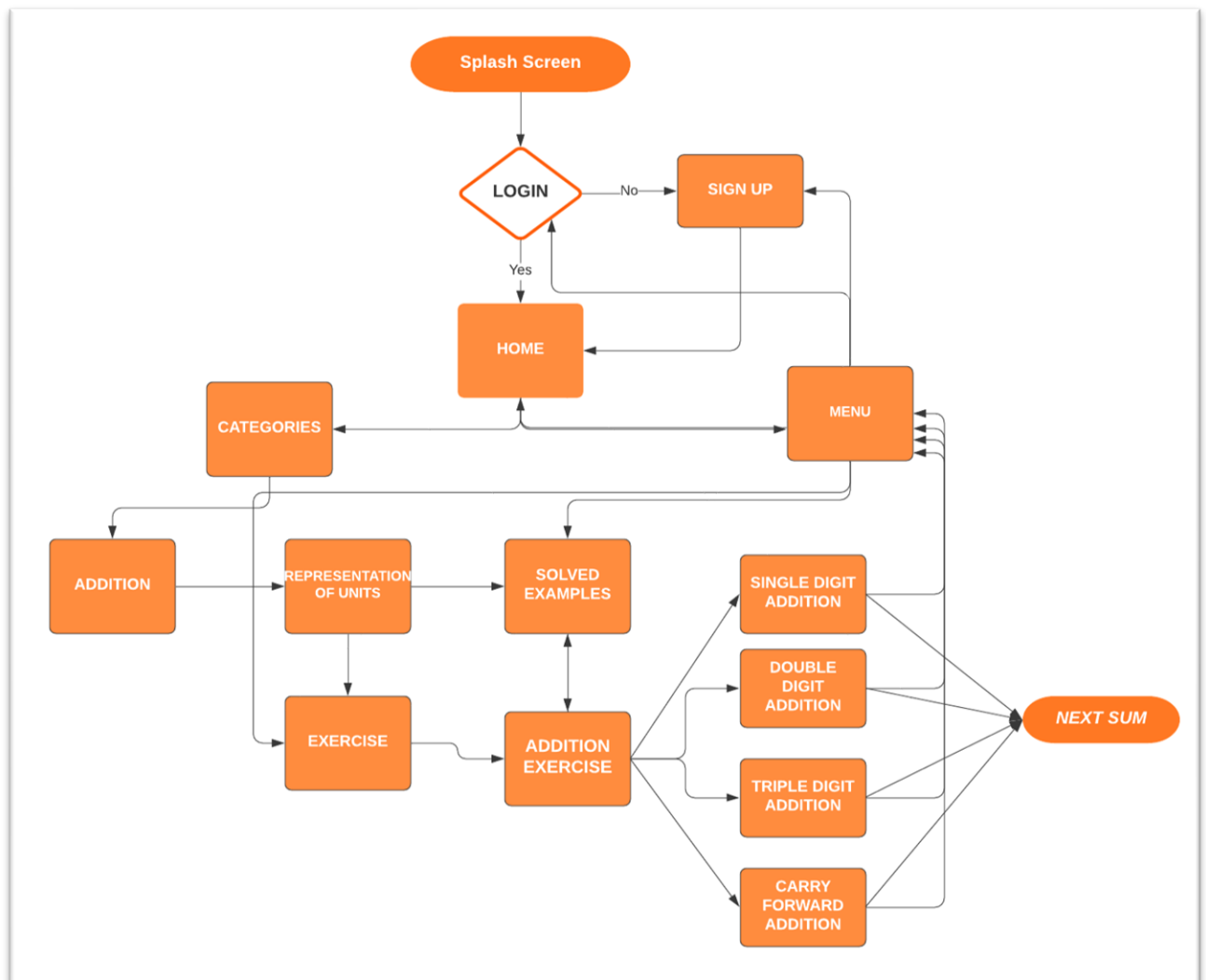CONTACT

SIGN UP
Already a member?
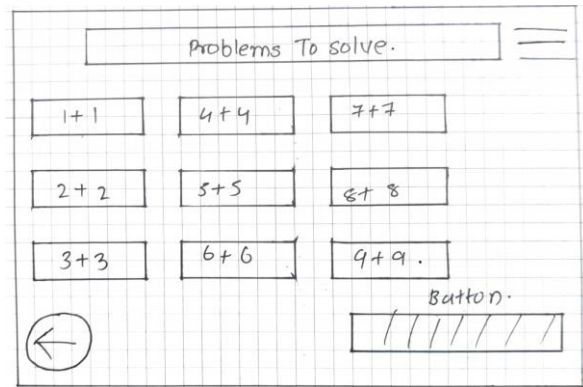
Logo:

As you can see below, the logo represents a stand and 3 rows filled with beads/circles. In our project we have explained how to perform addition with the help of circles, This logo signifies the counting of circles which is helpful while calculating addition of various addition problems.
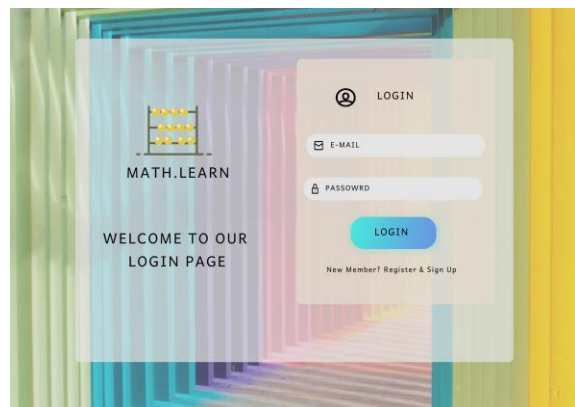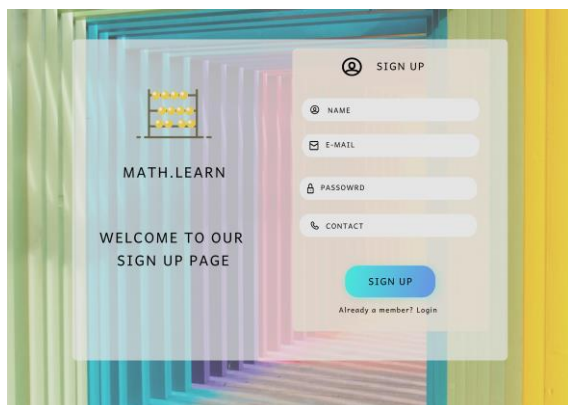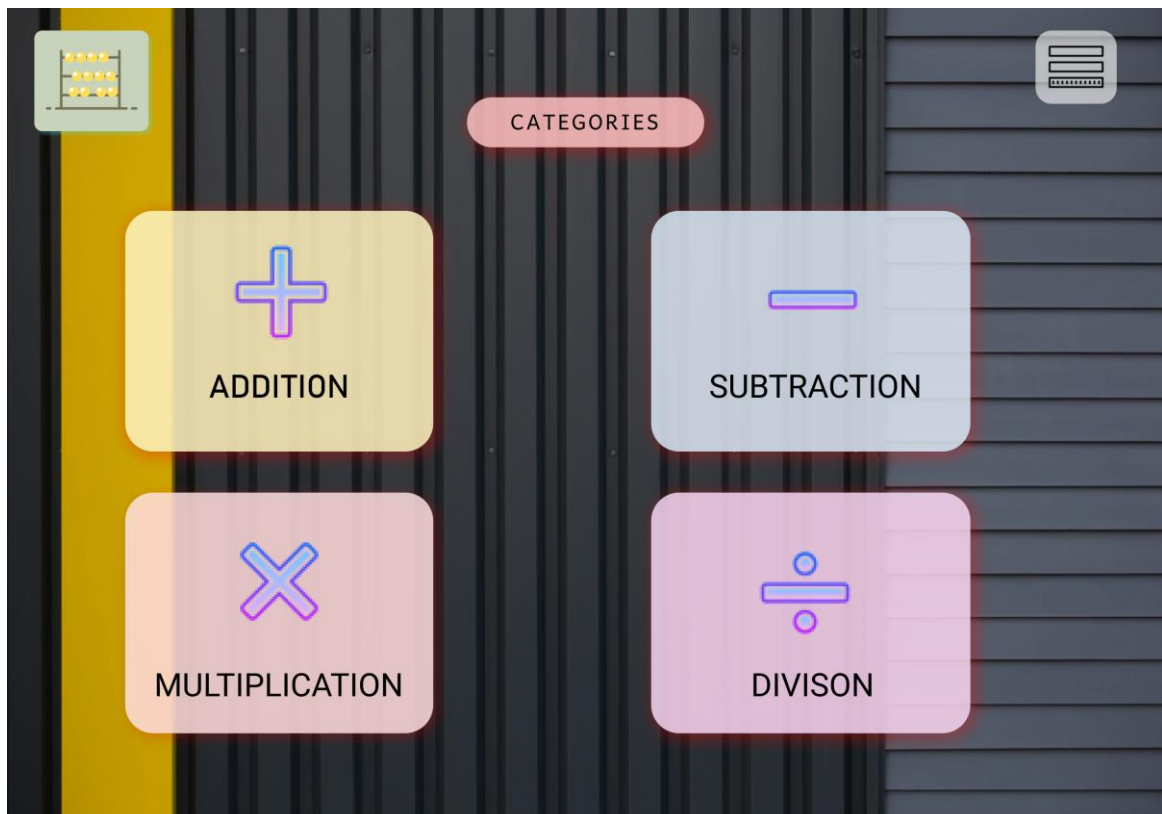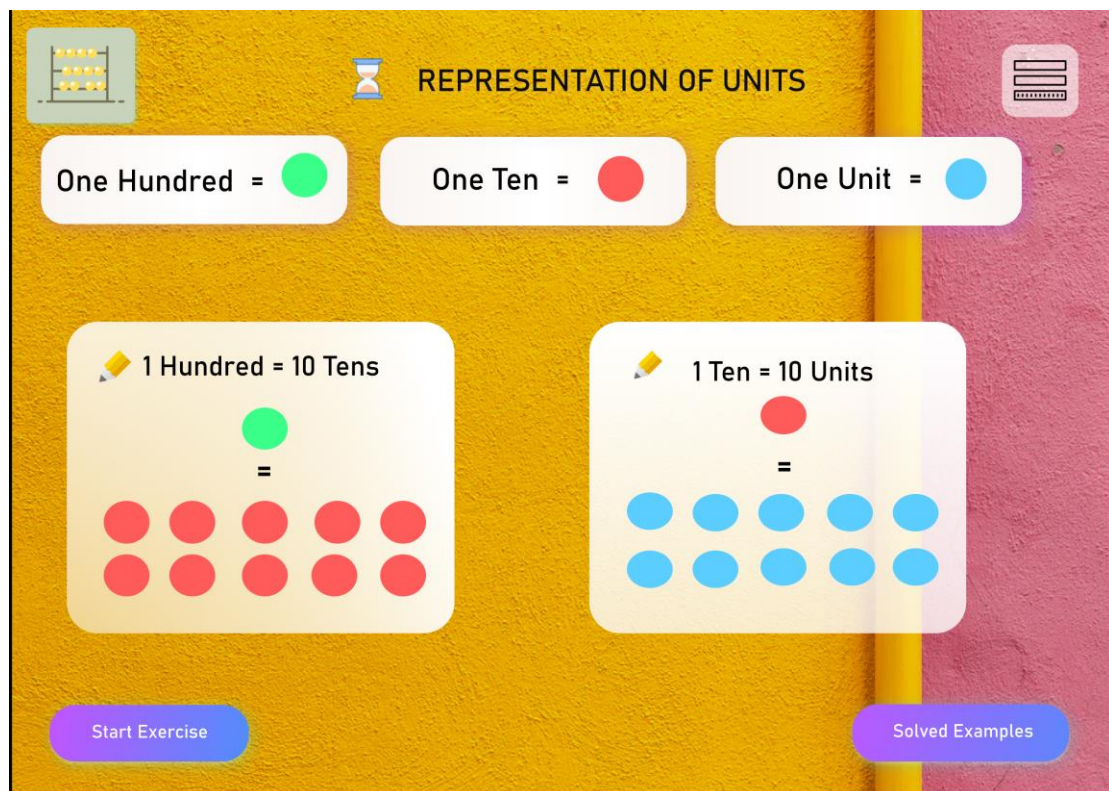

MATH.LEARN

Userflow:

Prototype:

Home Page:

Sign Up:

Categories:

Representation Of Units:

Solved Example:

Exercise and Problems:

Problems:

Solution:

Part 4 Evaluation

Lets Name the Users as A,B,C:

1.USER A:

No	Category	Score	Level
1	Content-Organization-Readability	0.7500	Good
2	Navigation and Links	0.8750	Excellent
3	User Interface Design	1.0000	Excellent
4	Performance And Effectiveness	0.8750	Excellent
5	Pedagogy	0.8750	Excellent
	Overall	**0.8750**	**Excellent**

2. USER B:

No	Category	Score	Level
1	Content-Organization-Readability	0.6667	Good
2	Navigation and Links	0.9167	Excellent
3	User Interface Design	1.0000	Excellent
4	Performance And Effectiveness	0.8750	Excellent
5	Pedagogy	0.8958	Excellent
	Overall	**0.8708**	**Excellent**

3. USER C:

No	Category	Score	Level
1	Content-Organization-Readability	0.7917	Good
2	Navigation and Links	0.8333	Excellent
3	User Interface Design	0.7917	Good
4	Performance And Effectiveness	0.7500	Good
5	Pedagogy	0.8542	Excellent
	Overall	**0.8042**	**Excellent**

Cumulative Grading: Excellent

Part 5 Conclusion

Conclusion & Future Scope:

Dyslexia is a learning disorder that involves difficulty reading due to problems identifying speech sounds and learning how they relate to letters and words. Keeping this in mind it was necessary to come up with a method which involves more visual elements rather than textual teaching and audio clips. The methodology which we used for teaching addition involved shapes and colours assigned to distinct units. This would help the students to retain information which is less time consuming and the student can avoid the struggle of difficulty in reading the problems and identifying them. As you can observe we have mentioned a Hint Card, whenever the student is stuck at any step, he/she can refer the card and move ahead with the problem. Along with the hint, the student can often refer the representation of units, in case he/she is confused while performing addition.

Future Scope:

➢ Coming to future scope of this project, there are varieties of methods in which we can represent the data or tutorials.
➢ We can make the environment student friendly by introducing the game format. After crossing each level, the student can be credited with certain number of points.
➢ This competition would ensure that the student can practise as ma y problems he/she can and get better at solving mathematics.
➢ Adding effects or a character which would appreciate the student for achieving any milestone.
➢ Apart from addition operation there are many operations such as subtraction, multiplication, division, BODMAS method etc which are also an integral part of fundamental mathematics.

➢ We can introduce their favourite cartoon character as their instructor which will not only be easy to learn with but a fun element for students to learn this subject.

References:

Tools Used:

Figma

Lucid Charts

Canva

Links:

https://www.figma.com/proto/nU4GoWlwWyFgtZlQgWBZoG/HMI-PROJECT?page-id=101%3A2&node-id=118%3A21&viewport=-114%2C1281%2C0.25&scaling=scale-down

https://www.lucidchart.com

https://www.webmd.com/children/understanding-dyslexia-basics

https://www.understood.org/en/learning-thinking-differences/child-learning-disabilities/dyscalculia/what-is-dyscalculia