“ Website for School Students to Learn Math ”

Mini Project Report

Submitted in partial fulfillment of the requirements of the subject Mini Project

by

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This is to certify that the project entitled ***"Website for School Students to Learn Math"*** *is a bona fide work of Anirudh Bhattacharya, Mink Shethia, Prachiti Bapat, Saumya Shah submitted as mini project in the subject of Mini project in* ***"Computer Engineering".***

_____

Prof. Shubhada Labde
(Project Guide)

DECLARATION

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. we also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. we understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Anirudh Bhattacharya _____

Mink Shethia _____

Prachiti Bapat _____

Saumya Shah _____

Date:

ACKNOWLEDGEMENT

Before presenting out our seminar work entitled "**WEBSITE FOR SCHOOL STUDENTS TO LEARN MATH**" we would like to convey our sincere thanks to many people who guided us throughout the course for this seminar work. First, we would like to express our sincere thanks to our beloved Principal **DR. SURESH K. UKARANDE** for providing various facilities to carry out this report.

We would like to express our sincere thanks to **Ms. SHUBHADA LABDE** for her guidance, encouragement, co-operation and suggestions given to us at progressing stages of report.

Finally, we would like to thank our **H.O.D. Dr. SARITA AMBADEKAR** and all teaching, non-teaching staff of the college and friends for their moral support rendered during the course of the report work and for their direct and indirect involvement in the completion of our report work, which made our endeavour fruitful.

Anirudh Bhattacharya

Mink Shethia

Prachiti Bapat

Saumya Shah

ABSTRACT

Mathematics is a difficult subject for many students, right from the first grade, up to university level mathematics. Many are unable to excel in this subject due to it's difficulty and are forced to join extra classes to help them pass the subject sometimes to no avail. If mathematics is not understood by a student at a young age, it causes the student many problems in the future as there are many subjects like Physics and Programming, important subjects which are highly dependent on Mathematics. Students studying in underfinanced schools have more problems studying Mathematics. This is a major problem in many schools in our state, let alone our country.

The Solution is to create a system by which students can learn basic mathematics from the comfort of their home whilst having fun. The only requirement is a smart phone, so that students from all walks of life can study mathematics. The knowledge they gain while using the system will build the foundation, upon which students can build upon to succeed academically. Our aim is to help all young students improve their knowledge of mathematics so that in the future, they may succeed academically and help our country grow.

The system is designed to teach students basic mathematics, right from basic counting, up to and including divisions. This will help students from multiple grades to strengthen their knowledge of Mathematics.

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CHAPTER 1

INTRODUCTION

1.1 Introduction:

Mini Project on **Website for School Students to Learn Math**

This is a website which will help students learn basic mathematics. This site will be aimed mostly at students of the first and second grade with focus on concepts such as addition, subtraction, multiplication and division. By using our site the students will strengthen their foundations of mathematics and will not face too many difficulties going forward in life.

1.2 Problem Introduction:

- Mathematics is a difficult students for many students from all grades.
- Mathematics forms the base on which university level mathematics, programming and physics is based.
- For many students, their base is not well formed.
- Students studying in underfinanced schools have more problems while studying Mathematics.

CHAPTER 2

REQUIREMENT SPECIFICATION

2.1 INTRODUCTION:

To be used properly, the device software needs certain hardware components or the other software resources to be present on the device. These pre-requisites are known as (computer) system requirements and are often used as a guideline as opposed to an absolute rule. Most software defines two sets of system requirements: minimum and recommended. With increasing demand for higher processing power and resources in newer versions of software, system requirements tend to increase over time. Industry analysts suggest that this trend plays a bigger part in driving upgrades to existing computer systems than technological advancements.

2.2 HARDWARE REQUIREMENTS:

The most common set of requirements defined by any operating system or software application is the physical computer resources, also known as hardware. A hardware requirements list is often accompanied by a hardware compatibility list (HCL), especially in case of operating systems. An HCL lists tested, compatibility and sometimes incompatible hardware devices for a particular operating system or application. The following sub-sections discuss the various aspects of hardware requirements.

HARDWARE REQUIREMENTS FOR PRESENT PROJECT:

PROCESSOR : Intel Pentium dual core or above.

RAM : 1 GB

Network Interface.

2.3 SOFTWARE REQUIREMENTS:

Software Requirements deal with defining software resource requirements and pre-requisites that need to be installed on a computer to provide optimal functioning of an application. These requirements or pre-requisites are generally not included in the software installation package and need to be installed separately before the software is installed.

SOFTWARE REQUIREMENTS FOR OUR PROJECT:

OPERATING SYSTEM : Windows XP and above, Ubuntu v12.04, Android 4 and above.

FRONT END : HTML, CSS, JS

CHAPTER 3

ANALYSIS

3.1 PROPOSED SYSTEM:

The Solution is to create a system by which students can learn basic Mathematics from the comfort of their own homes whilst having fun. The only requirement is a smartphone or a personal computer or a laptop, so that students from all walks of life can study mathematics. The knowledge they will gain using our system will build the foundation upon which students can build on to succeed academically.
The website will be available in the English Language and Marathi Language so that students from all over our state will be able to study properly.

3.2 FEASIBILITY STUDY

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.

Three key considerations involved in the feasibility analysis are:

3.2.1 Economic Feasibility

Users will just need to visit our site to learn the concepts of Addition, Subtraction, Multiplication, Division and take our interactive tests. The user can access our site using just a mobile phone or a laptop with access to a web browser and the internet. This site will be free to access to all, as our site will be aimed for students from all walks of life.

3.2.2 Technical Feasibility

The technical feasibility assessment meets with the expected needs of the proposed system. It has evaluated that hardware and software meets the need of the proposed system. The assessment based on the project of online testing consist of an interactive interface between student and teachers reveals the following outline design of system requirements:

- HTML
- CSS
- Javascript

These above mentioned technologies have been thoroughly studied by our group members from sites such as W3 and online courses like Coursera. We have made the site look professional and at the same time, simple which our target users (1st and 2nd grade children) will find easy on the eyes.

3.2.3 Operational Feasibility

This site can be accessed from anywhere with an internet connection. Our website can run on any browser too, from Microsoft Internet Explorer to Mozilla Firefox and Google Chrome.

3.3 SOFTWARE SPECIFICATION

HTML:

Describe HTML.

- Hyper Text Markup Language, or HTML, is the industry-standard markup language for building Web pages.
- HTML explains how a Web page is put together.
- HTML is made up of several components.
- HTML components instruct browsers on how to display material.
- The labels "this is a header," "this is a paragraph," "this is a link," etc. are provided by HTML elements.

An illustration of a basic HTML document is:

```
<!DOCTYPE html>
<html>
<head>
<title>Page Title</title>
</head>
<body>

<h1>My First Heading</h1>
<p>My first paragraph.</p>

</body>
</html>
```

Explaining the above example:

- The <!DOCTYPE html> declaration defines that this document is an HTML5 document
- The <html> element is the root element of an HTML page
- The <head> element contains meta information about the HTML page
- The <title> element specifies a title for the HTML page (which is shown in the browser's title bar or in the page's tab)
- The <body> element defines the document's body, and is a container for all the visible contents, such as headings, paragraphs, images, hyperlinks, tables, lists, etc.
- The <h1> element defines a large heading
- The element defines a paragraph

What is an HTML element?

- An HTML element is defined by a start tag, some content, and an end tag:
- <tagname>Content goes here...</tagname>
- The HTML **element** is everything from the start tag to the end tag:
- <h1>My First Heading</h1>
- My first paragraph

CASCADING STYLE SHEETS (CSS):

What is CSS?

- CSS stands for Cascading Style Sheets
- CSS describes how HTML elements are to be displayed on screen, paper, or in other media
- CSS saves a lot of work. It can control the layout of multiple web pages all at once
- External stylesheets are stored in CSS files

Why use it?

CSS is used to define styles for your web pages, including the design, layout and variations in display for different devices and screen sizes.

An example of CSS:

```
body {
  background-color: lightblue;
}

h1 {
  color: white;
  text-align: center;
}

p {
  font-family: verdana;
  font-size: 20px;
}
```

What are it's advantages? Why is it the best tool to use with html?

HTML was NEVER intended to contain tags for formatting a web page!

HTML was created to describe the content of a web page, like:

<h1>This is a heading</h1>

This is a paragraph.

When tags like <font>, and color attributes were added to the HTML 3.2 specification, it started a nightmare for web developers. Development of large websites, where fonts and color information were added to every single page, became a long and expensive process.

To solve this problem, the World Wide Web Consortium (W3C) created CSS.

CSS removed the style formatting from the HTML page!

The style definitions are normally saved in external .css files.

With an external stylesheet file, you can change the look of an entire website by changing just one file!

JAVASCRIPT:

WHAT IS JAVASCRIPT?

Javascript is a dynamic computer programming language. It is lightweight and most commonly used as a part of web pages, whose implementations allow client-side script to interact with the user and make dynamic pages. It is an interpreted programming language with object-oriented capabilities.

JavaScript was first known as **LiveScript,** but Netscape changed its name to JavaScript, possibly because of the excitement being generated by Java. JavaScript made its first appearance in Netscape 2.0 in 1995 with the name **LiveScript**. The general-purpose core of the language has been embedded in Netscape, Internet Explorer, and other web browsers.

The ECMA-262 Specification defined a standard version of the core JavaScript language.

- JavaScript is a lightweight, interpreted programming language.
- Designed for creating network-centric applications.
- Complementary to and integrated with Java.
- Complementary to and integrated with HTML.
- Open and cross-platform

JavaScript can be used to trap user-initiated events such as button clicks, link navigation, and other actions that the user initiates explicitly or implicitly.

ADVANTAGES OF JAVASCRIPT:

The merits of using JavaScript are −

- **Less server interaction** − You can validate user input before sending the page off to the server. This saves server traffic, which means less load on your server.
- **Immediate feedback to the visitors** − They don't have to wait for a page reload to see if they have forgotten to enter something.
- **Increased interactivity** − You can create interfaces that react when the user hovers over them with a mouse or activates them via the keyboard.
- **Richer interfaces** − You can use JavaScript to include such items as drag-and-drop components and sliders to give a Rich Interface to your site visitors.

LIMITATIONS OF JAVASCRIPT:

We cannot treat JavaScript as a full-fledged programming language. It lacks the following important features −

- Client-side JavaScript does not allow the reading or writing of files. This has been kept for security reason.

- JavaScript cannot be used for networking applications because there is no such support available.
- JavaScript doesn't have any multithreading or multiprocessor capabilities.

Once again, JavaScript is a lightweight, interpreted programming language that allows you to build interactivity into otherwise static HTML pages.

LIBRARIES USED:

- Forty by HTML5UP: https://html5up.net/

  This library was used in the home page. It has been modified to use our theme colours and images of our choice and also the fit the overall template of our page.

- W3 CSS: https://www.w3schools.com/css/

  This library was used in most pages. We modified many parts of the code to fit our template and use our theme colours.

  This template was also used in the Learn page with the navigation buttons placed to the left of our content.

- FontAwesome: https://fontawesome.com/

  This library was used in the contact us page for the professional social media website links.

- Google Fonts: https://fonts.google.com/

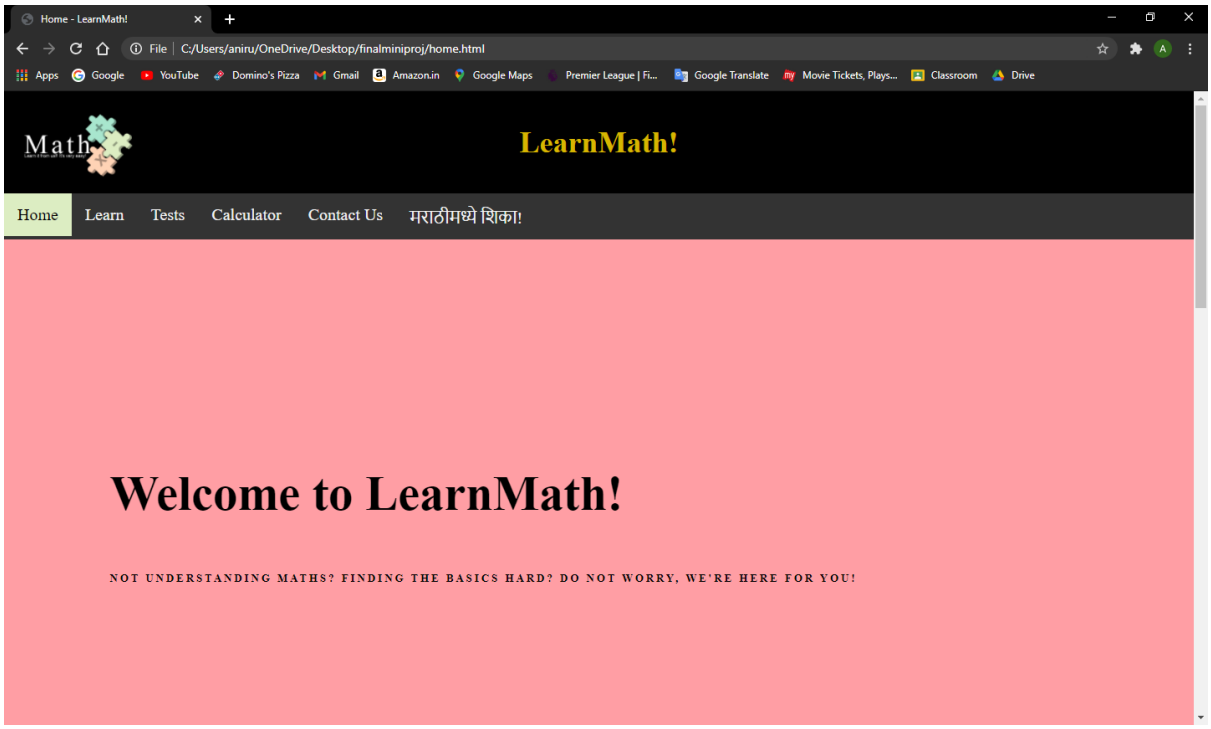
  This library was used in the homepage and the Contact Us page.

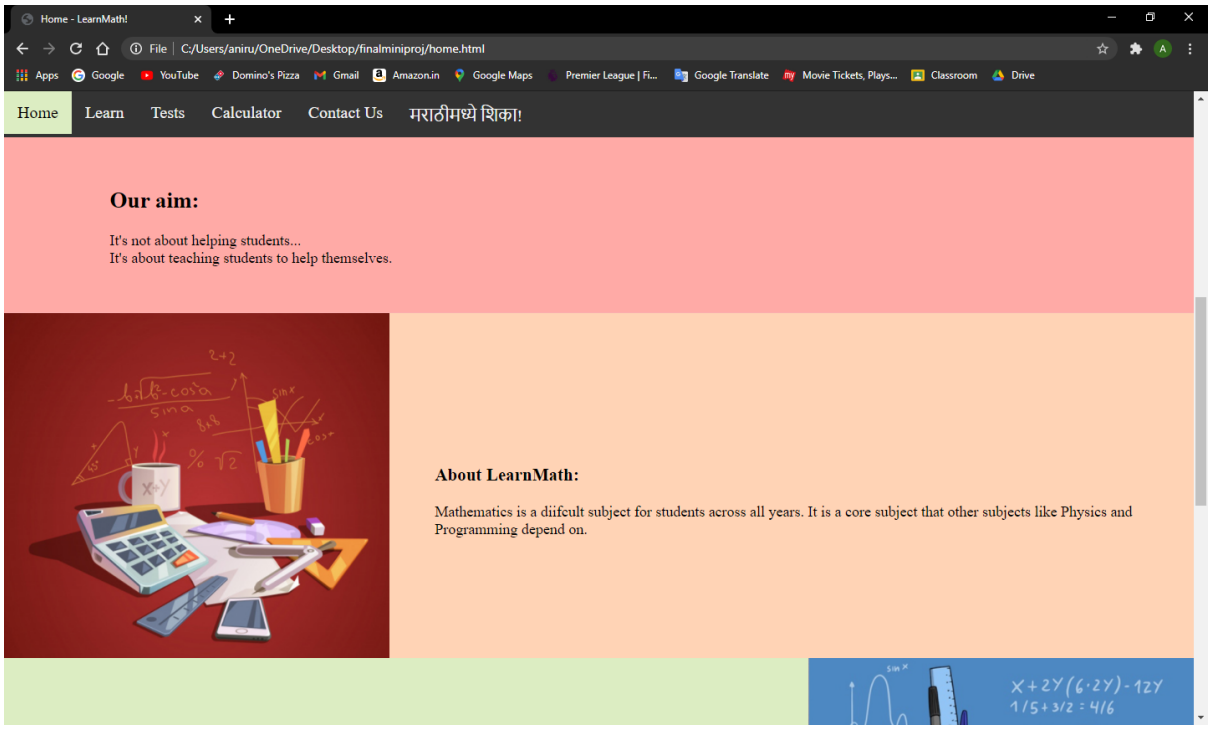
CHAPTER 4

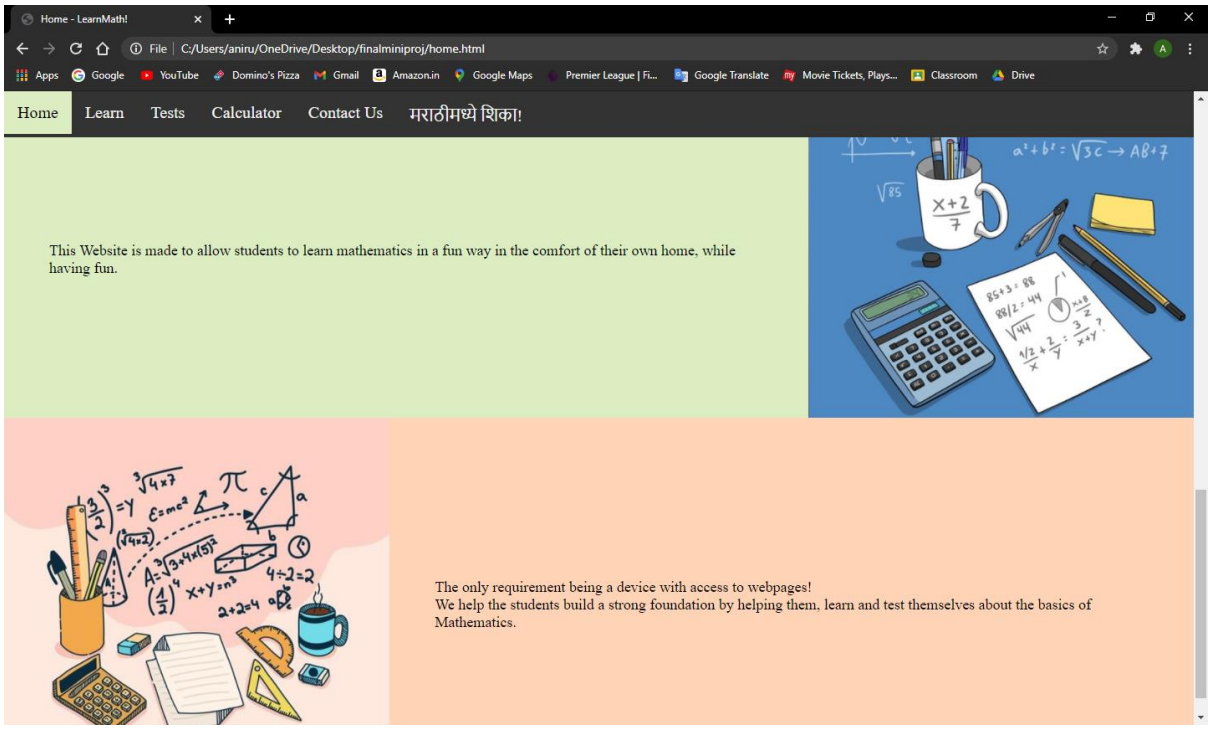
IMPLEMENTATION

Screenshots are provided below:

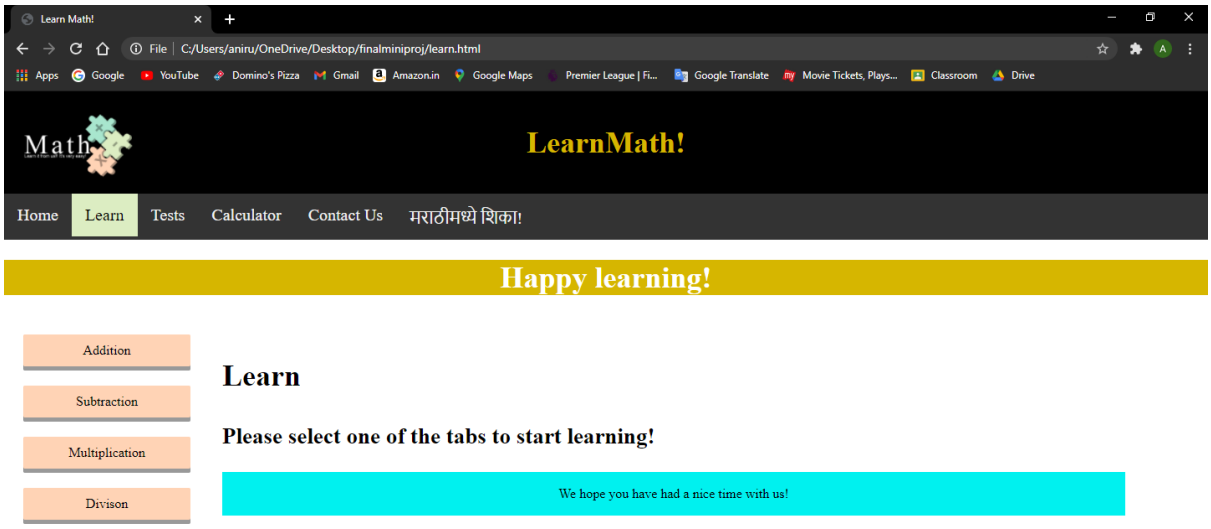
Home page, with aforementioned library:



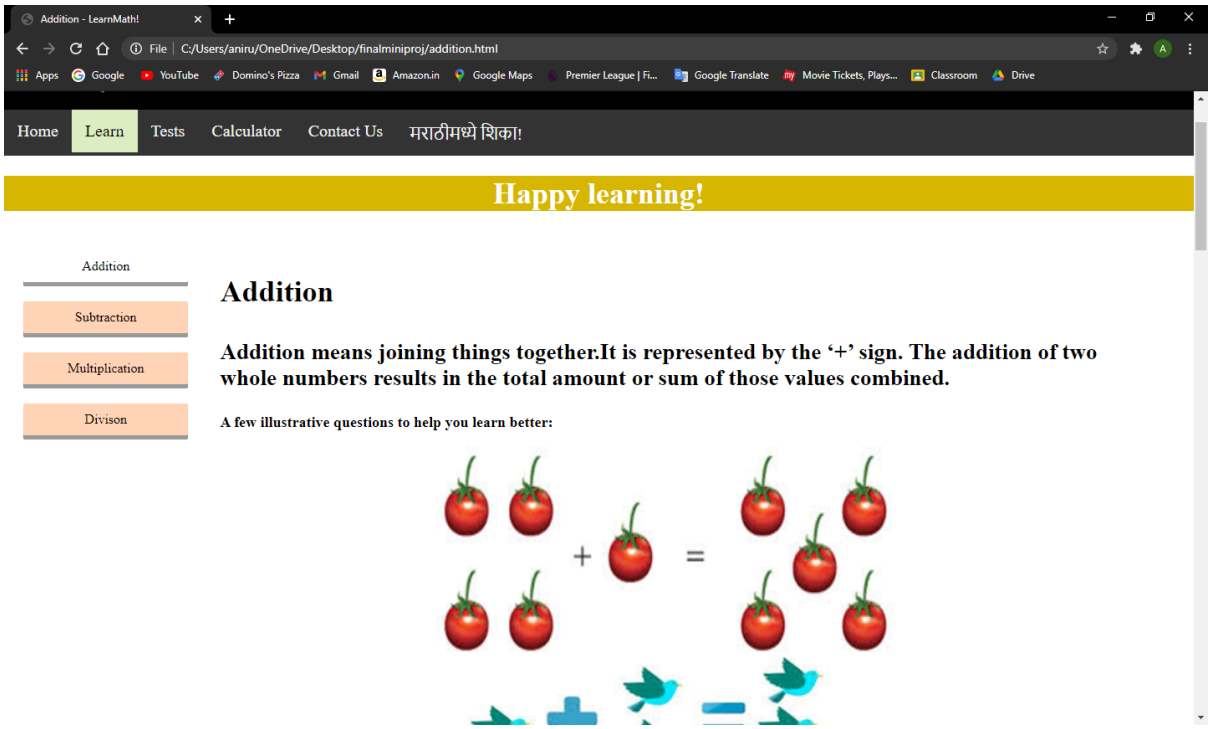


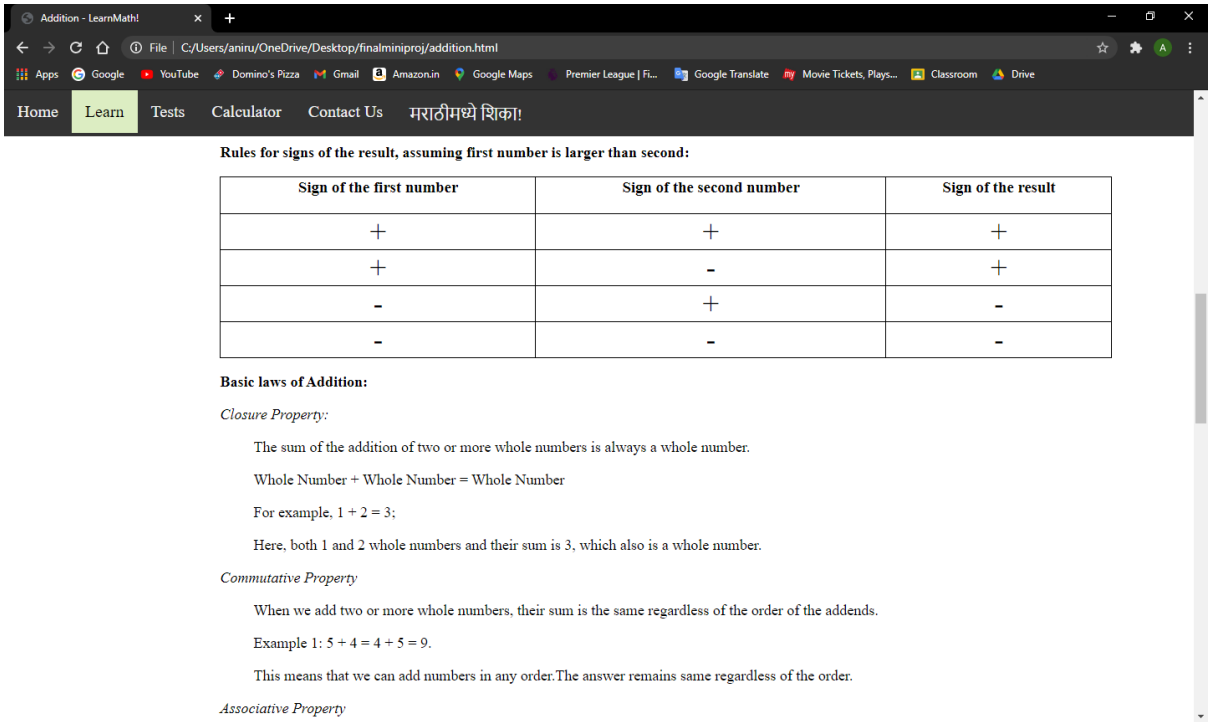


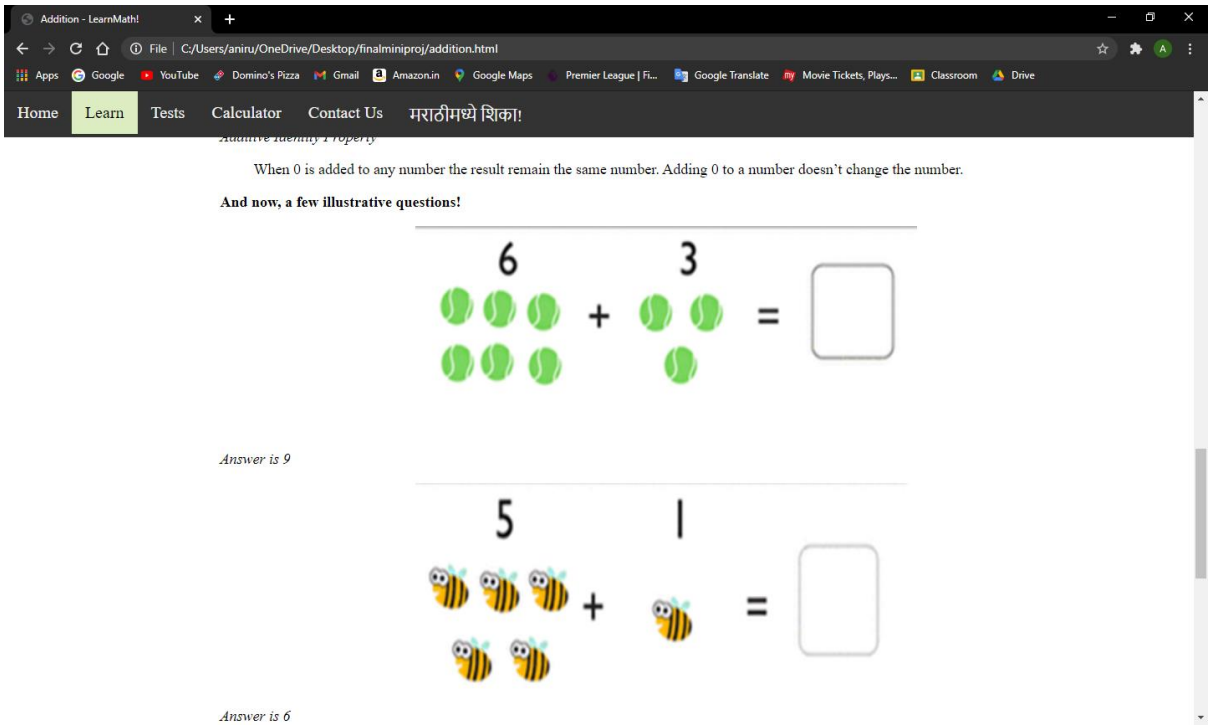
Learn Page:

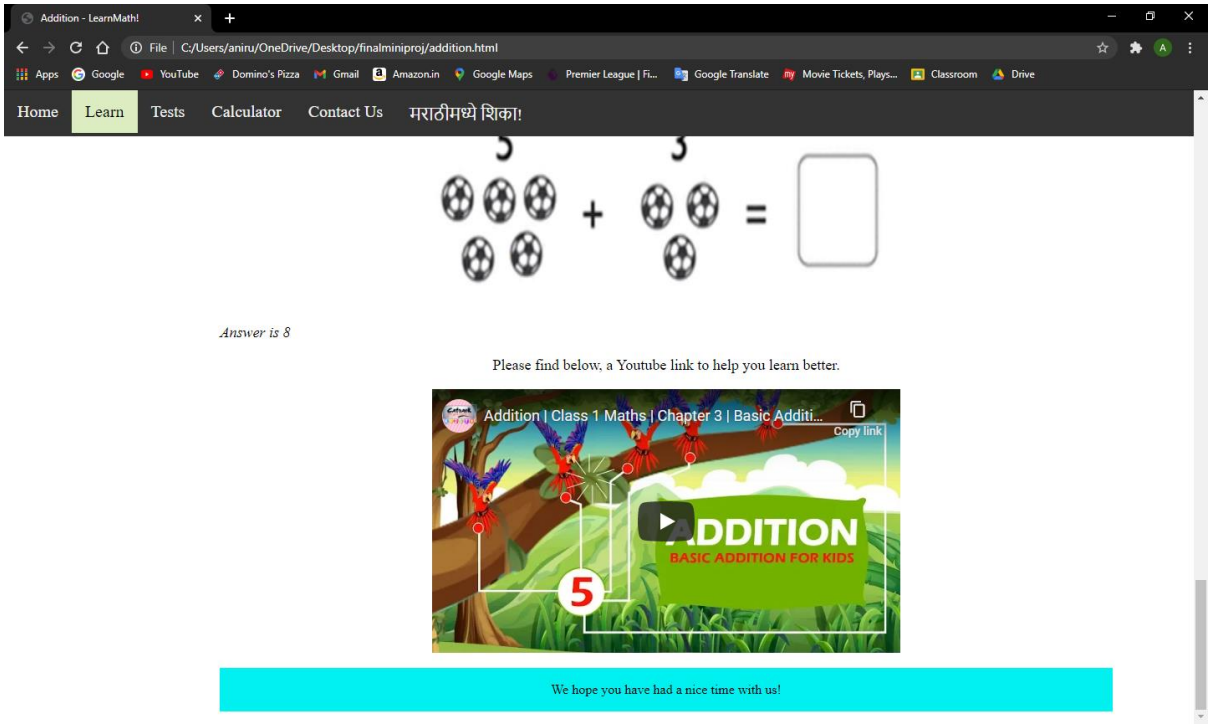


Addition Section of Learn page:

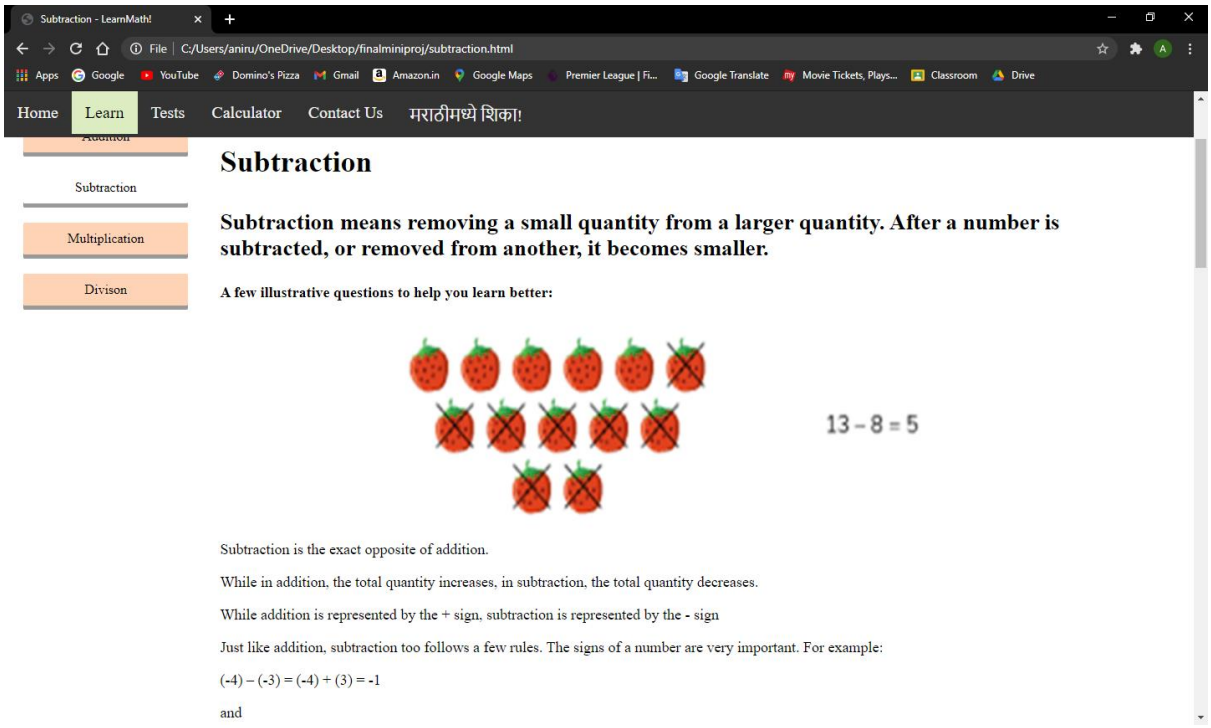

Addition - LearnMath!
File | C:/Users/aniru/OneDrive/Desktop/finalminiproj/addition.html
Apps Google YouTube Domino's Pizza Gmail Amazon.in Google Maps Premier League | Fi... Google Translate Movie Tickets, Plays... Classroom Drive
Home Learn Tests Calculator Contact Us मराठीमध्ये शिका!
Happy learning!
Addition
Subtraction
Multiplication
Divison
Addition
Addition means joining things together.It is represented by the '+' sign. The addition of two whole numbers results in the total amount or sum of those values combined.
A few illustrative questions to help you learn better:

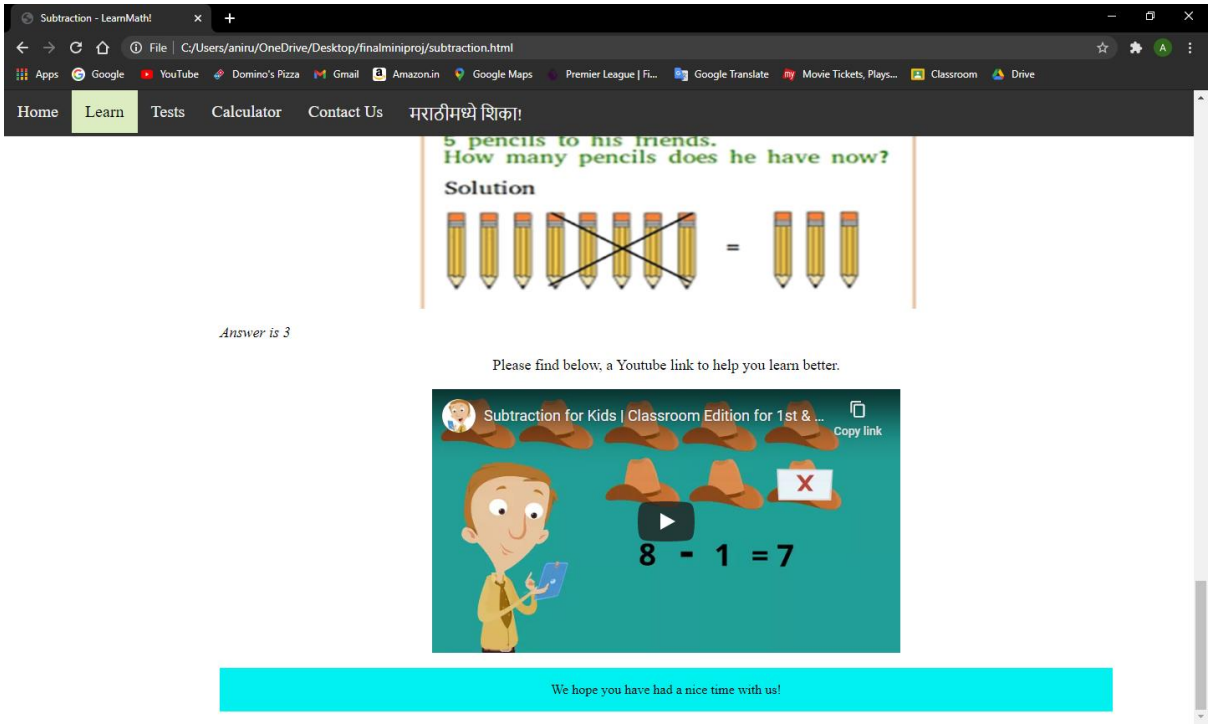

Addition - LearnMath!
File | C:/Users/aniru/OneDrive/Desktop/finalminiproj/addition.html
Apps Google YouTube Domino's Pizza Gmail Amazon.in Google Maps Premier League | Fi... Google Translate Movie Tickets, Plays... Classroom Drive
Home Learn Tests Calculator Contact Us मराठीमध्ये शिका!
Rules for signs of the result, assuming first number is larger than second:
Sign of the first number
Sign of the second number
Sign of the result
+ + +
+ - +
- + -
- - -
Basic laws of Addition:
Closure Property:
The sum of the addition of two or more whole numbers is always a whole number.
Whole Number + Whole Number = Whole Number
For example, 1 + 2 = 3;
Here, both 1 and 2 whole numbers and their sum is 3, which also is a whole number.
Commutative Property
When we add two or more whole numbers, their sum is the same regardless of the order of the addends.
Example 1: 5 + 4 = 4 + 5 = 9.
This means that we can add numbers in any order.The answer remains same regardless of the order.
Associative Property





Subtraction:





Multiplication:

Multiplication - LearnMath!

File | C:/Users/aniru/OneDrive/Desktop/finalminiproj/multiplication.html

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Math

LearnMath!

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Happy learning!

Addition

Subtraction

Multiplication

Divison

Multiplication

What is multiplication?

Multiplication of two numbers is adding the first number to the second number, the second number of times. It is also called as repeated addition.

It is denoted by the 'x' symbol.

To perform Multiplication, one needs to know Addition properly, which can be learnt here.

Now,Let's take an example:

Q] What is the answer of 4 x 3?

Answer: Here, the first number is 4 And second number is 3

Multiplication - LearnMath!

File | C:/Users/aniru/OneDrive/Desktop/finalminiproj/multiplication.html

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27

x 35

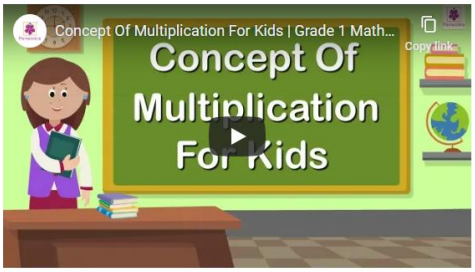
---

135 (we calculate 27 x 5)

+ 810 (we put the zero and calculate 27 x 3)

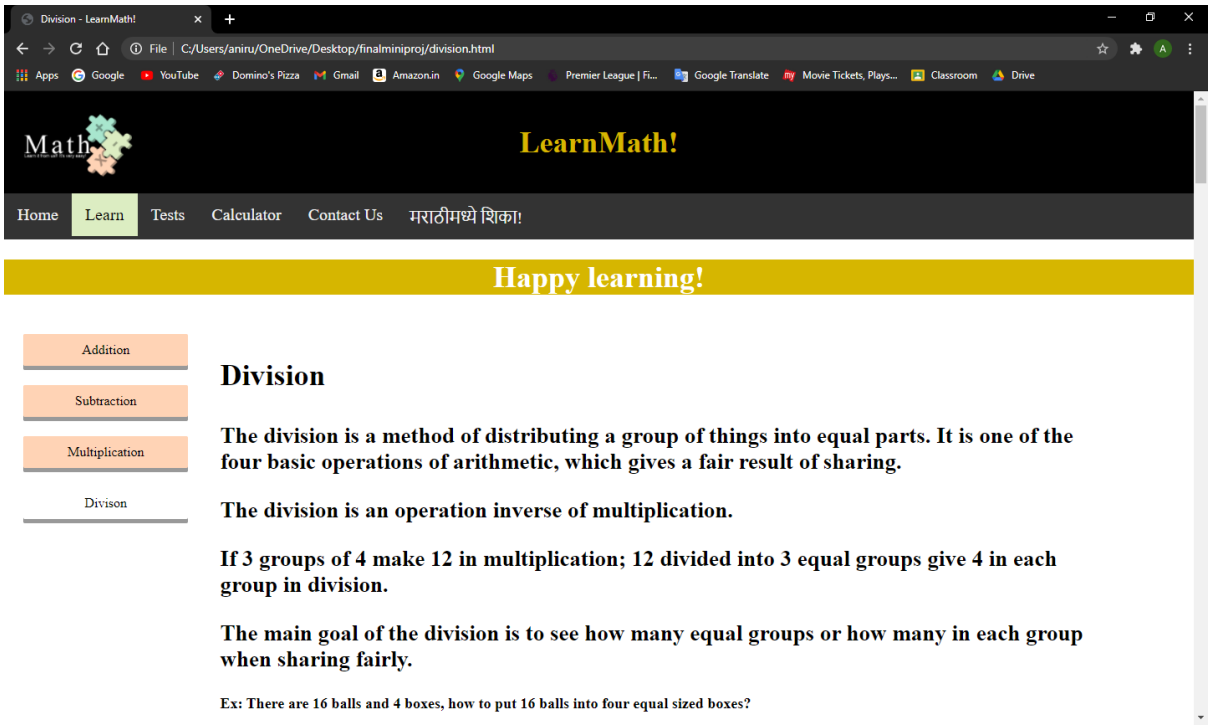
945

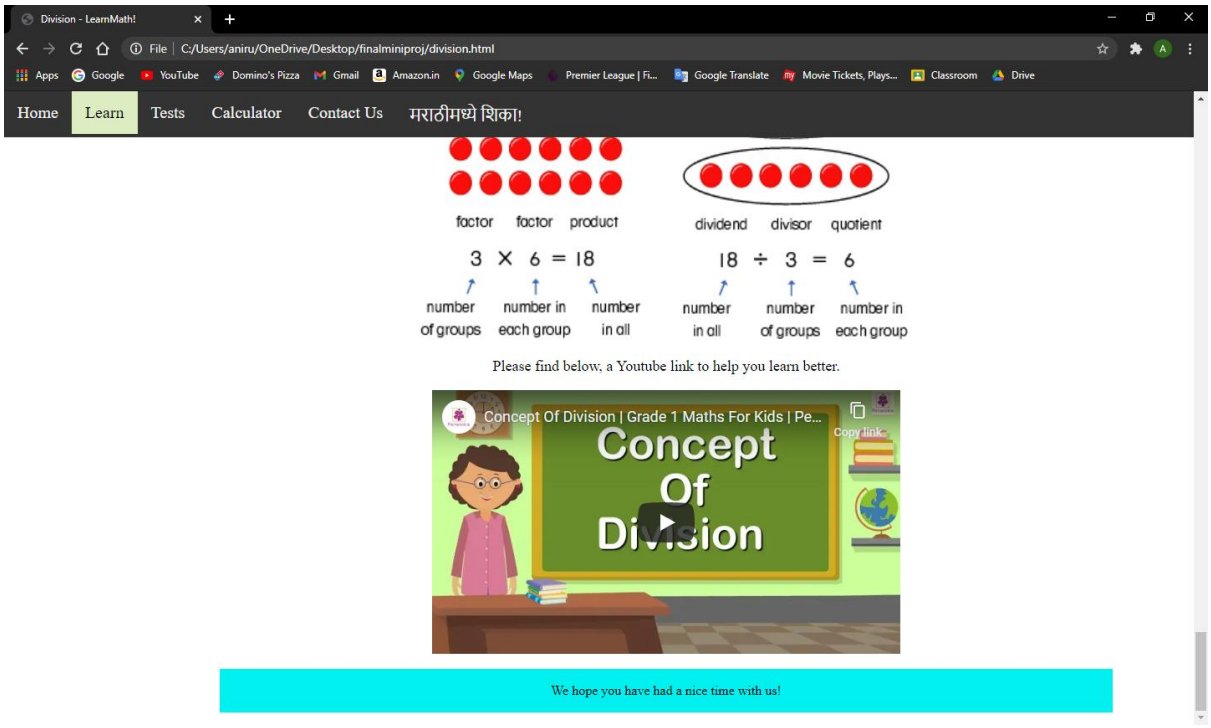
Please find below, a Youtube link to help you learn better.



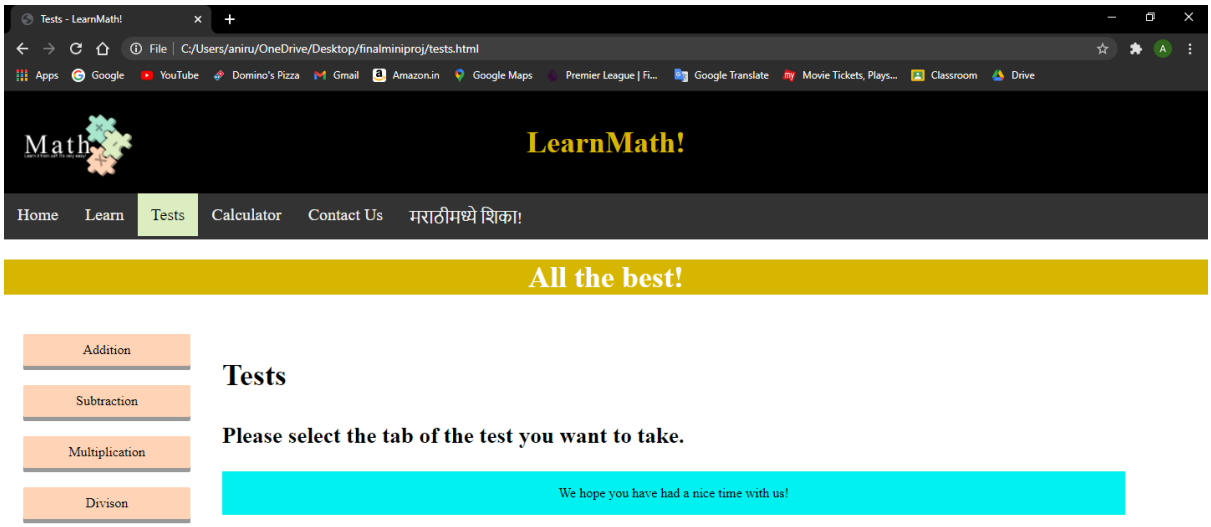
We hope you have had a nice time with us!

Division:

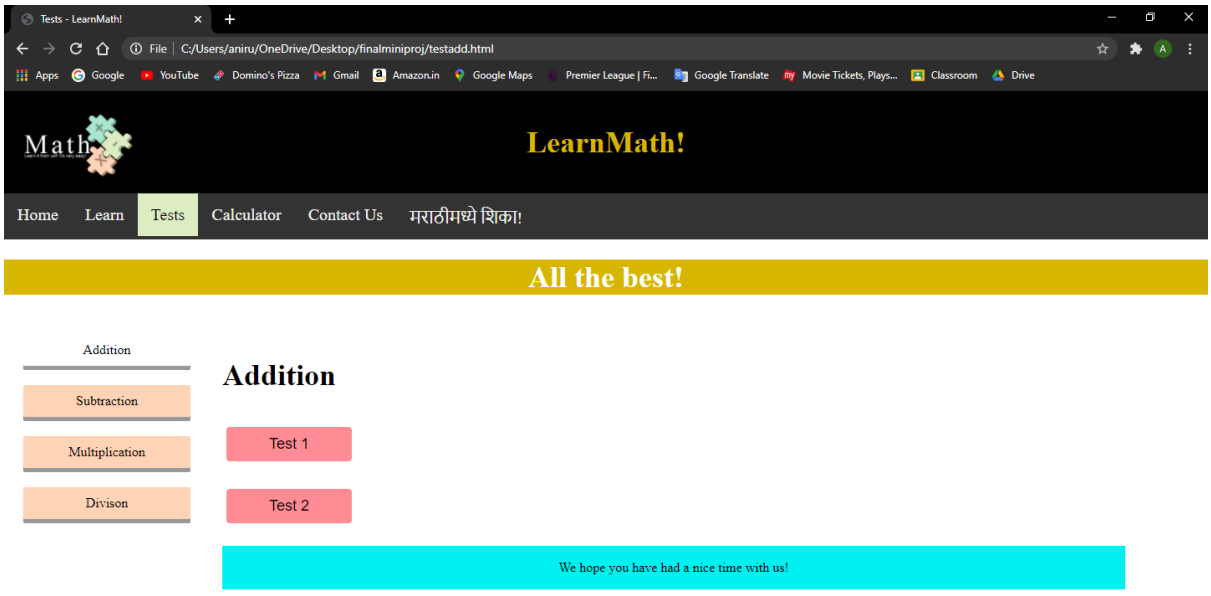




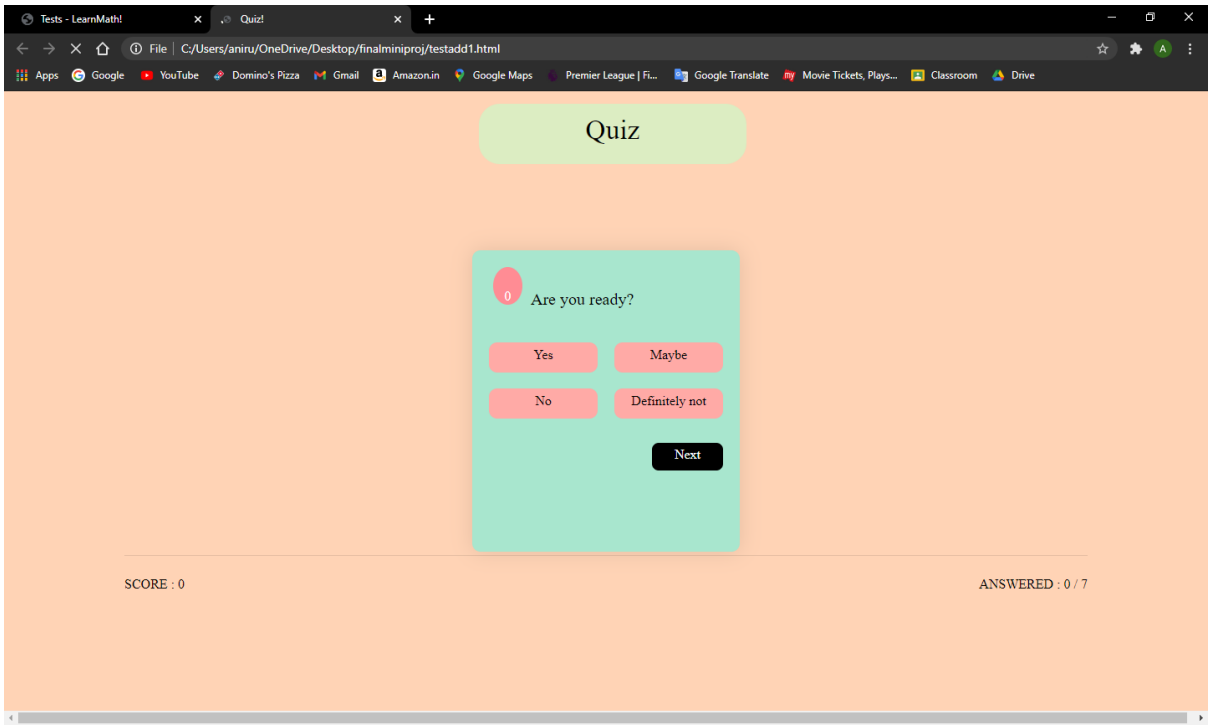
Tests page:



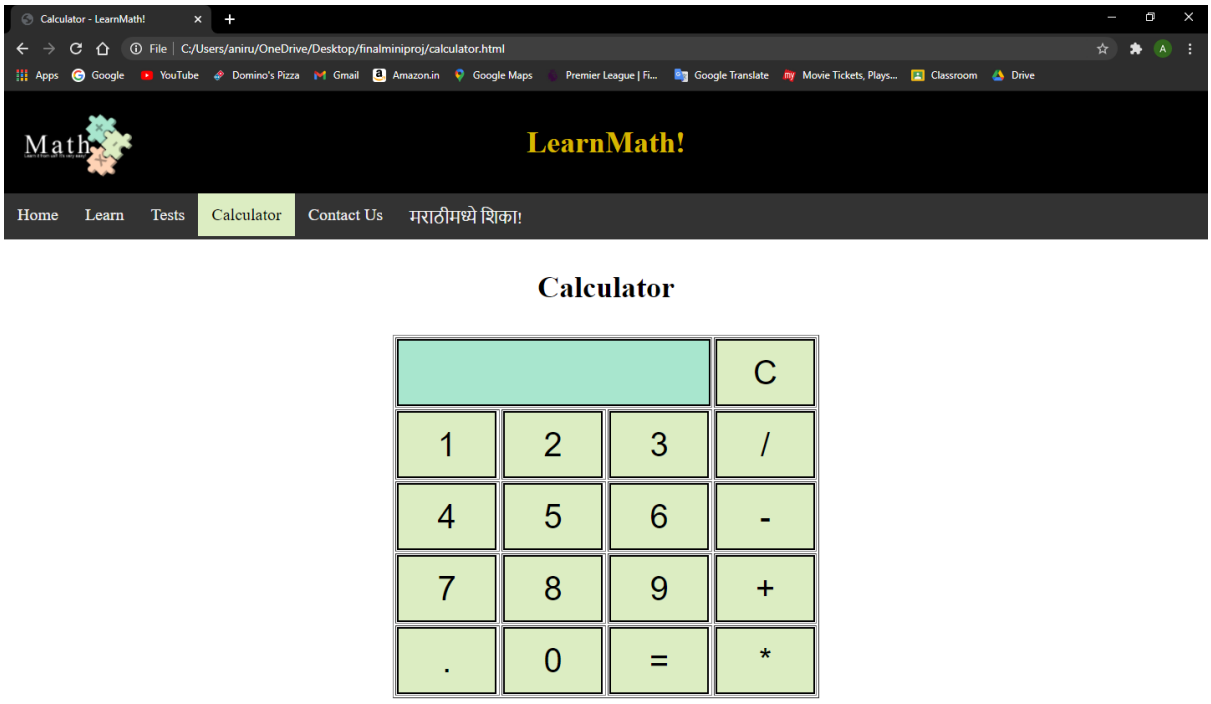
Two levels of tests on different concepts.



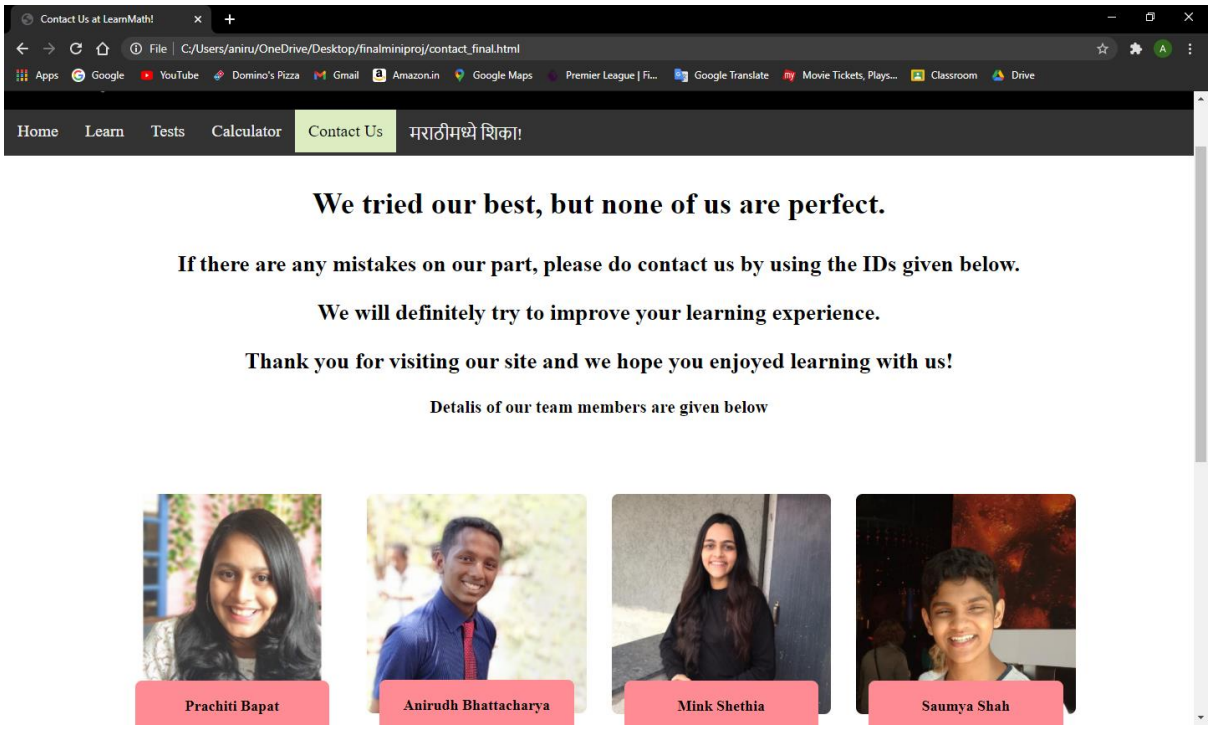
The test:



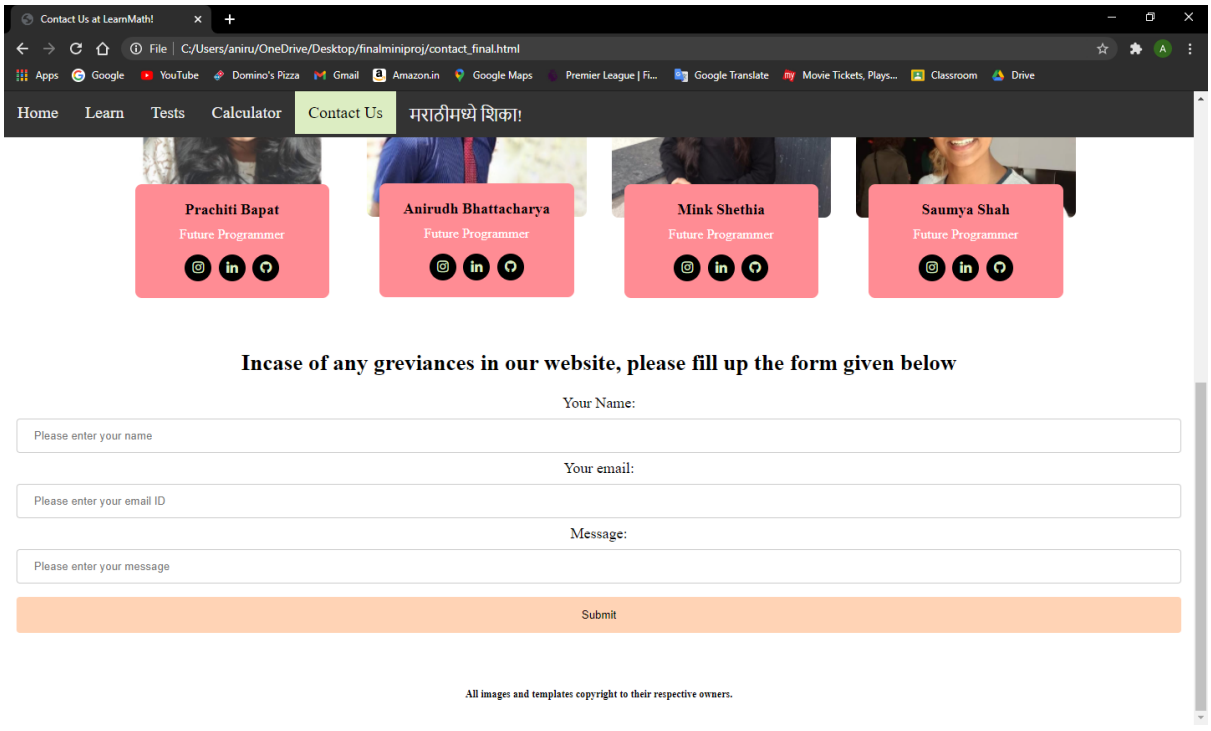
Calculator:



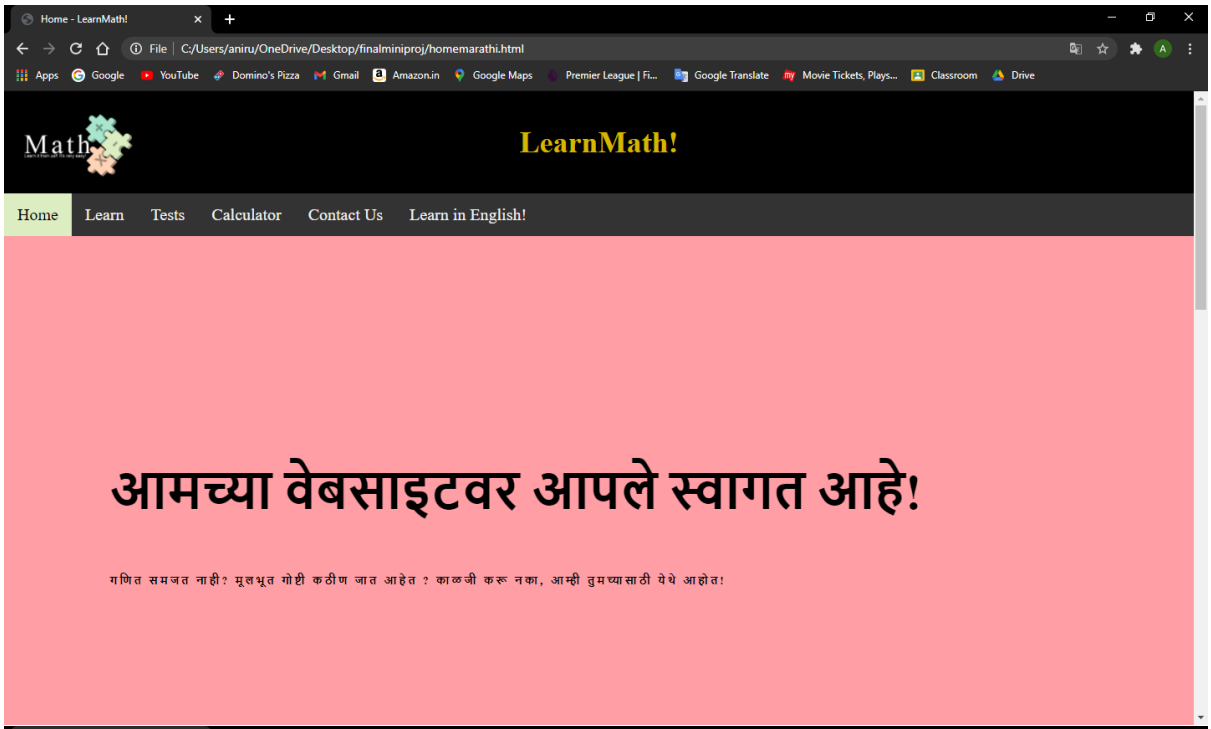
Contact us page with links to professional social media links.



The form in Contact Us page:



The entire page in Marathi: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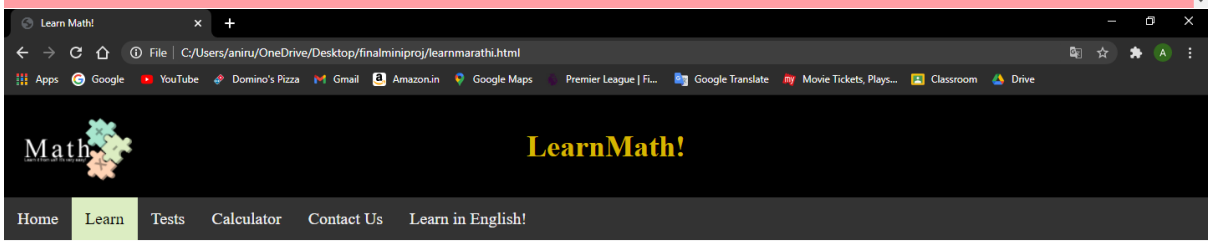
Apps Google YouTube Domino's Pizza Gmail Amazon.in Google Maps Premier League | Fi... Google Translate Movie Tickets, Plays... Classroom Drive
Math
LearnMath!
Home Learn Tests Calculator Contact Us Learn in English!
आमच्या वेबसाइटवर आपले स्वागत आहे!
गणित समजत नाही? मूलभूत गोष्टी कठीण जात आहेत ? काळजी करू नका, आम्ही तुमच्यासाठी येथे आहोत!


Learn Math!
File | C:/Users/aniru/OneDrive/Desktop/finalminiproj/learnmarathi.html
Apps Google YouTube Domino's Pizza Gmail Amazon.in Google Maps Premier League | Fi... Google Translate Movie Tickets, Plays... Classroom Drive
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LearnMath!
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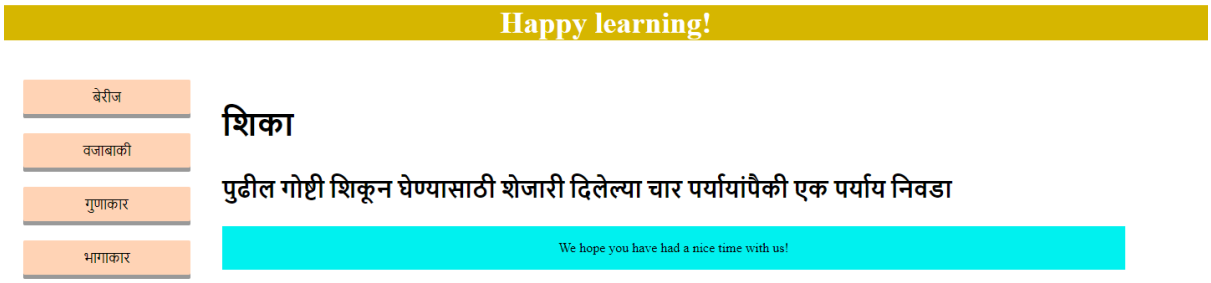
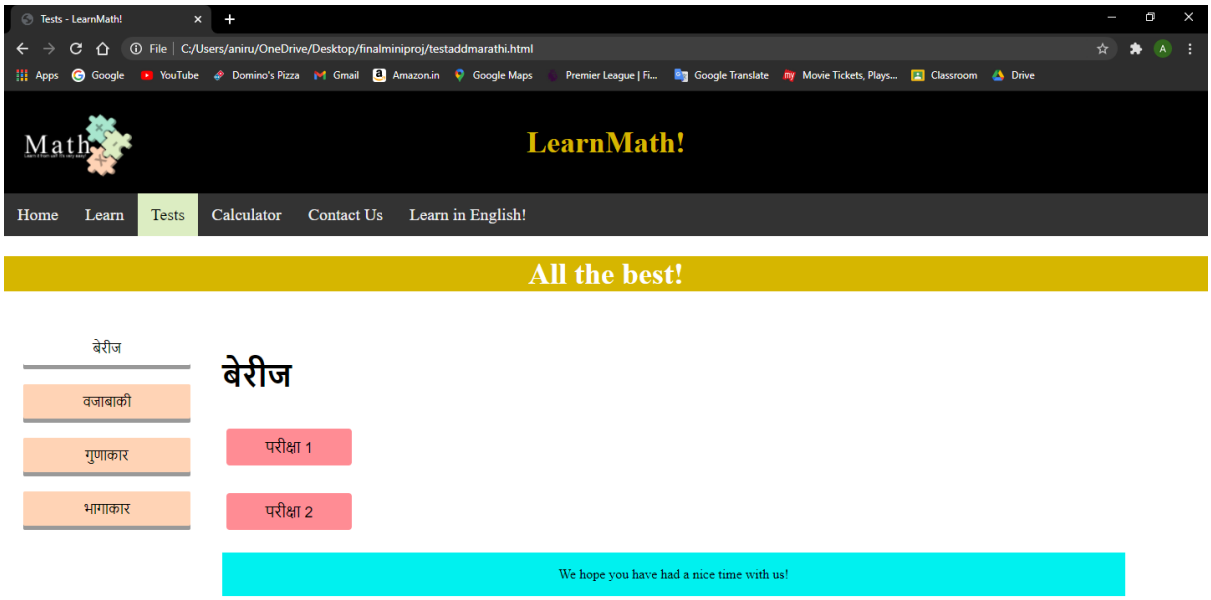

Happy learning!
बेरीज
वजाबाकी
गुणाकार
भागाकार
शिका
पुढील गोष्टी शिकून घेण्यासाठी शेजारी दिलेल्या चार पर्यायांपैकी एक पर्याय निवडा
We hope you have had a nice time with us!


Tests - LearnMath!
File | C:/Users/aniru/OneDrive/Desktop/finalminiproj/testaddmarathi.html
Apps Google YouTube Domino's Pizza Gmail Amazon.in Google Maps Premier League | Fi... Google Translate Movie Tickets, Plays... Classroom Drive
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All the best!
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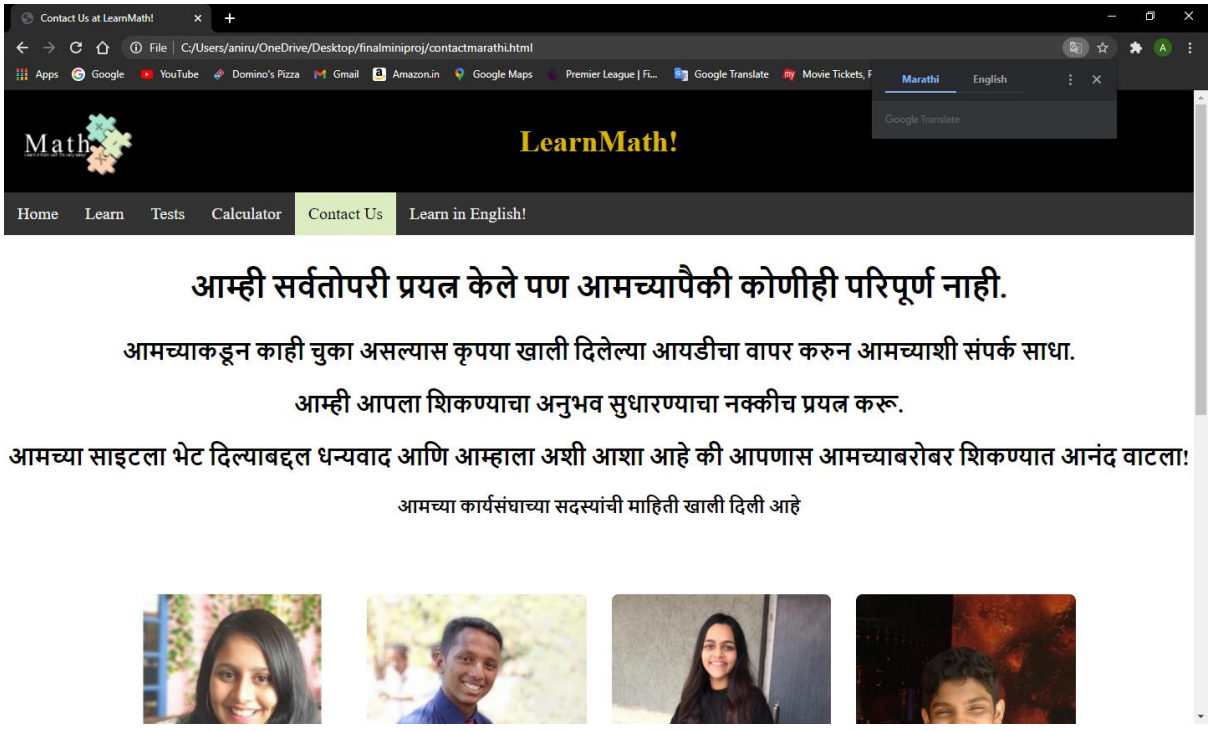
भागाकार
बेरीज
परीक्षा 1
परीक्षा 2
We hope you have had a nice time with us!


Contact Us at LearnMath!
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Marathi English
Google Translate
Math
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Home Learn Tests Calculator Contact Us Learn in English!
आम्ही सर्वतोपरी प्रयत्न केले पण आमच्यापैकी कोणीही परिपूर्ण नाही.
आमच्याकडून काही चुका असल्यास कृपया खाली दिलेल्या आयडीचा वापर करुन आमच्याशी संपर्क साधा.
आम्ही आपला शिकण्याचा अनुभव सुधारण्याचा नक्कीच प्रयत्न करू.
आमच्या साइटला भेट दिल्याबद्दल धन्यवाद आणि आम्हाला अशी आशा आहे की आपणास आमच्याबरोबर शिकण्यात आनंद वाटला!
आमच्या कार्यसंघाच्या सदस्यांची माहिती खाली दिली आहे

Functioning:

The HTML and CSS code render a responsive web page which enables a user to learn the concepts they desire. The JavaScript code makes the website easier to use.

To launch the application, run home.html

CHAPTER 5

TESTING

5.1 INTRODUCTION TO SYSTEM TESTING:

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub assemblies, assemblies and/or a finished product It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

5.2 TYPES OF TESTING:

1. **Unit testing:**

   Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .it is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

2.Integration testing:

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfaction, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

3.Functional test:

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is centered on the following items:
Valid Input : identified classes of valid input must be accepted.
Invalid Input : identified classes of invalid input must be rejected.
Functions : identified functions must be exercised.
Output : identified classes of application outputs must be exercised.
Systems/Procedures: interfacing systems or procedures must be invoked.

Organization and preparation of functional tests is focused on requirements, key functions, or special test cases. In addition, systematic coverage pertaining to identify Business process flows; data fields, predefined processes, and successive processes must be considered for

testing. Before functional testing is complete, additional tests are identified and the effective value of current tests is determined.

4. System Test:

System testing ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results. An example of system testing is the configuration oriented system integration test. System testing is based on process descriptions and flows, emphasizing pre-driven process links and integration points.

5. **White Box Testing:**

White Box Testing is a testing in which in which the software tester has knowledge of the inner workings, structure and language of the software, or at least its purpose. It is purpose. It is used to test areas that cannot be reached from a black box level.

6. **Black Box Testing:**

Black Box Testing is testing the software without any knowledge of the inner workings, structure or language of the module being tested. Black box tests, as most other kinds of tests, must be written from a definitive source document, such as specification or requirements document, such as specification or requirements document. It is a testing in which the software under test is treated, as a black box .you cannot "see" into it. The test provides inputs and responds to outputs without considering how the software works.

7. **Unit Testing:**

Unit testing is usually conducted as part of a combined code and unit test phase of the software lifecycle, although it is not uncommon for coding and unit testing to be conducted as two distinct phases.

8. **Integration Testing:**

Software integration testing is the incremental integration testing of two or more integrated software components on a single platform to produce failures caused by interface defects. The task of the integration test is to check that components or software applications, e.g. components in a software system or – one step up – software applications at the company level – interact without error.

9. **Acceptance Testing:**

User Acceptance Testing is a critical phase of any project and requires significant participation by the end user. It also ensures that the system meets the functional requirements.

5.3 Testing of Project

Test strategy and approach

Field testing will be performed manually and functional tests will be written in detail.

Test objectives

- All field entries must work properly.
- Pages must be activated from the identified link.
- The entry screen, messages and responses must not be delayed.

Testing of different pages:

Home:

This used the Forty library as mentioned above. The CSS has been modified so as to include our navigation bar and our theme colours. The code runs without errors.

Learn:

We have added buttons to the page to navigate through different sections. The content and it's images are fully visible as well as the YouTube links which direct users to the site are visible and functional.

Calculator:

The calculator is very basic so as not to encourage our learners to cheat. It's coded mainly in JavaScript. On testing with multiple values and operations, it yielded accurate results, right from one digit numbers to five digit numbers.
Calculator has been tested and determined to be fully functional.

Tests:

In the two levels of tests for each subject, the test opens in a new tab. The questions are visible right away, and are in multiple choice question form. Once the student clicks on the right answer, the score increases by one and the questions answered count increases by one as illustrated in the above screenshots. On the completion of the test, student can see their total score. Additionally on the selection of the wrong answer or the right one, an audio clip (1s) plays which signals the right or wrong answer.

Contact Us:

In this page, we have included links to our professional social media websites namely LinkedIn and GitHub pages where people can view our profiles. These links are in the form of buttons which open up in a new tab.

We have also included a grievance form with basic details asked such as Name, E-mail Id and complaint with regards to our website. This opens up in the device's in built app (for android devices, in Gmail and in Microsoft devices in MS Outlook). This sends an email to us so that we can make the necessary changes to our site.

CHAPTER 6

CONCLUSION

In our project, we aim to teach students about the basics of Math in either English or their regional language of Marathi. This site will teach them only the basics and not the advanced concepts so as not to overwhelm the students.

Our aim is not to change students' futures, but to help them change it themselves.

REFERENCES

We have referred the following websites:

- https://www.w3schools.com/html/default.asp
- https://www.w3schools.com/css/default.asp
- https://www.w3schools.com/js/default.asp
- http://www.math.com/
- https://www.basic-mathematics.com/

Source Code:

https://drive.google.com/drive/folders/15W0PZOetswVkxR1Jz5H6bILVtjluCk3y?usp=sharing

Above mentioned drive folder includes the project source code, presentation and logbook.