Deploying a Static Website Using VMSS

Project Overview

This project focuses on creating a dynamic and user-friendly static website dedicated to offering a wide range of educational courses. By deploying this website on Azure's cloud platform, we aim to provide a comprehensive and engaging learning experience for students and educators alike. The website will feature a user-friendly interface, allowing users to explore detailed information about various courses, view high-quality educational content, and enroll in desired courses. Key features include a detailed course catalog, an easy enrollment system, access to video lectures and reading materials, tools to monitor student progress, and interactive elements like discussion forums and live Q&A sessions. The website's deployment on Azure will leverage a Virtual Machine Scale Set (VMSS) to ensure scalability, reliability, and cost-efficiency, maintaining performance during peak usage and protecting user data with robust security features.

Problem Statement

Traditional methods of delivering educational content, often reliant on physical classrooms and printed materials, lack the dynamic and engaging experience that modern learners demand. Additionally, managing and updating information across multiple channels can be cumbersome and inefficient. This project aims to address these challenges by creating a centralized platform that provides an immersive and interactive learning experience for students, enabling them to explore courses with ease and access up-to-date educational materials.

Project Goals

The primary goals of this project are to:

- Create a visually appealing and interactive static website that showcases educational courses in a comprehensive and engaging manner.
- Enhance student engagement by providing a user-friendly interface for exploring courses and accessing high-quality educational content.
- Streamline operations by centralizing course information and providing a single source of truth for both students and educators.
- Leverage Azure's scalable and reliable infrastructure to ensure website availability and performance, even during peak demand periods.
- Integrate analytics tools to track user engagement and learning outcomes, providing valuable insights for continuous improvement.

Technology and Azure Services Used

This project will leverage the following Azure services and technologies to create a robust and scalable website:

- **Azure Static Web Apps:** Provides a platform for hosting static websites and API backends, ensuring secure and scalable deployment.
- **Azure Blob Storage:** Used for storing website files, such as HTML, CSS, JavaScript, and images, allowing for efficient retrieval and distribution.
- **Azure CDN:** Delivers website content to users worldwide at high speeds, ensuring a smooth browsing experience.
- **Virtual Machine Scale Set (VMSS):** Provides a scalable infrastructure for running the website, enabling automatic scaling based on demand.
- **GitHub Actions:** Used to automate the website's deployment process, ensuring smooth and reliable updates.

Project Steps

The project deployment process will follow these key steps:

1. **Website Design and Development:** Create the website's front-end using HTML, CSS, and JavaScript, ensuring a visually appealing and user-friendly experience.
2. **Prepare Website Content:** Gather and organize all necessary content, including images, descriptions, and specifications for each car model.
3. **Configure Azure Static Web Apps:** Set up Azure Static Web Apps to host the website, defining routing rules and API endpoints if needed.
4. **Create Azure Blob Storage Container:** Configure a Blob storage container to store the website's files, ensuring secure access and efficient retrieval.
5. **Configure Azure CDN:** Set up Azure CDN to cache website content and distribute it to users globally, minimizing latency and ensuring fast loading times.
6. **Deploy Website to Azure:** Utilize GitHub Actions to automate the deployment process, pushing the website files to Azure Blob storage and configuring Azure Static Web Apps.
7. **Configure VMSS:** Define a VMSS to run the website's backend infrastructure, ensuring scalability and high availability.
8. **Testing and Optimization:** Thoroughly test the deployed website to ensure functionality, performance, and user experience. Optimize website performance for faster loading times and improved user engagement.

How to Use Educational Website

1. **Explore Our Website**: Start by browsing through our website to discover the variety of educational courses available.
2. **Select Your Course**: Choose the course, subject, and level that best fits your learning goals.
3. **Enroll in Your Course**: Complete the enrollment process by following the registration and payment steps.
4. **Follow Us**: If you're satisfied with our courses and services, stay connected by following us for updates and new course offerings.

Azure Services and Tools Used:

Azure provides a range of services and tools crucial for deploying and managing the static website:

- **Azure Portal:** The primary interface for managing Azure resources, including VMSS, Storage, CDN, and Azure AD.
- **Azure CLI:** Command-line interface for automating tasks and interacting with Azure resources.
- **Azure PowerShell:** Scripting language for managing Azure resources through a more robust and programmatic approach.
- **Azure Resource Manager (ARM):** Provides a framework for managing Azure resources through templates, enabling consistent and scalable deployments.
- **Azure Monitor:** Service for collecting and analysing telemetry data, providing insights into website performance, availability, and security

Screenshots:

- Created Resource Group Screenshot Create the resource group using custom azure cli commands:

[az group create - -name <resource-group-name> - -location <location-name>]

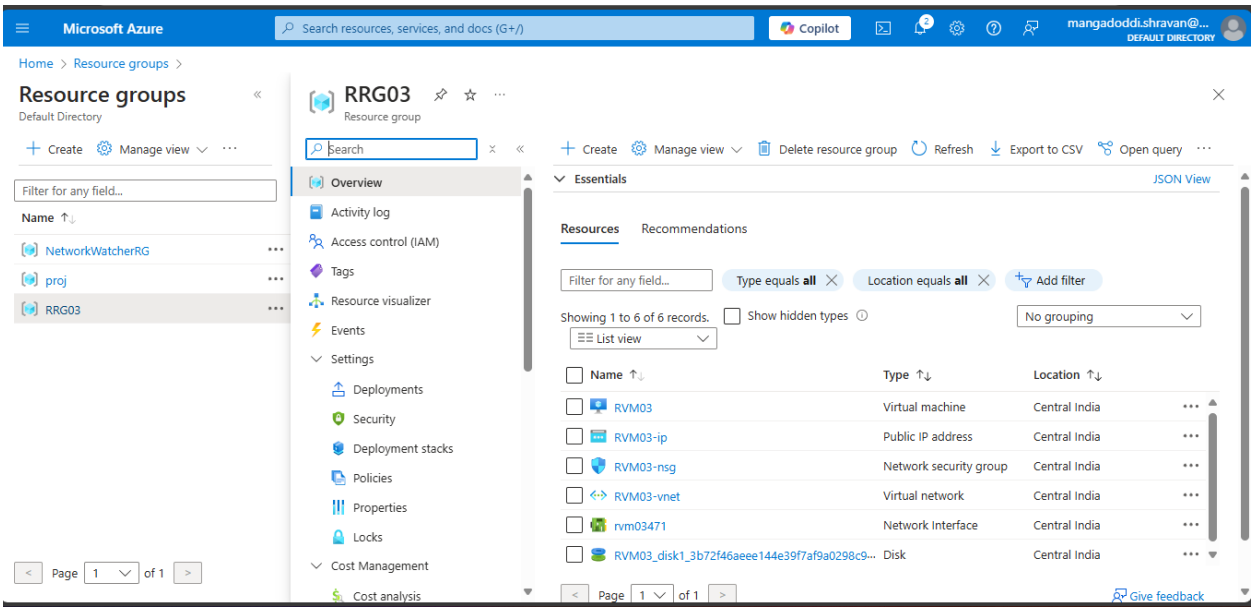
Ex: az group create - -name RRG03 - -location centralindia

```
PS C:\Users\k rahul> az group create -n RRG03 -l Centralindia
{
  "id": "/subscriptions/6cdc8da8-6822-445d-b20b-bfcacf45e41b/resourceGroups/RRG03",
  "location": "centralindia",
  "managedBy": null,
  "name": "RRG03",
  "properties": {
    "provisioningState": "Succeeded"
  },
  "tags": null,
  "type": "Microsoft.Resources/resourceGroups"
}
PS C:\Users\k rahul>
```

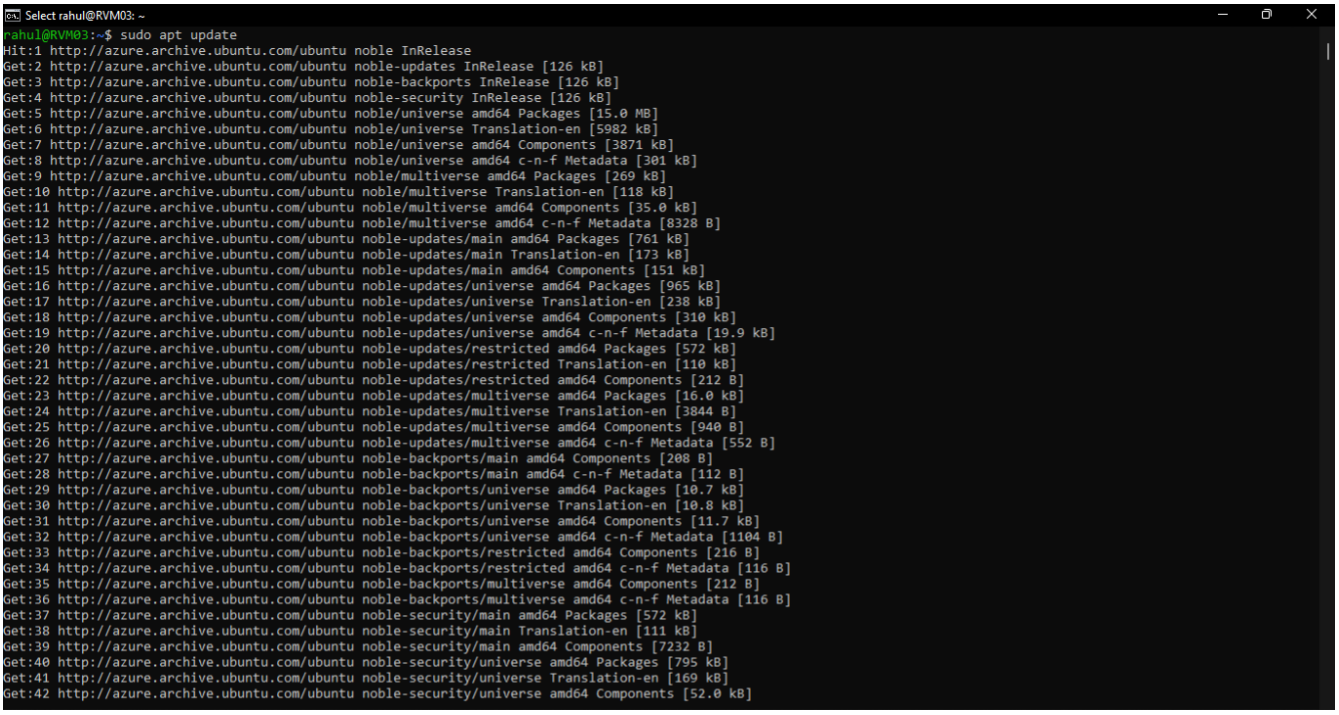
Resource of VM Using Azure Cli :

```
PS C:\Users\k rahul> az vmss create --resource-group RRG03 --name vmss03 --image Ubuntu2404 --admin-user rahul --admin-password azure@123456 --in
stance-count 2 --location Centralindia
- Running ..
```

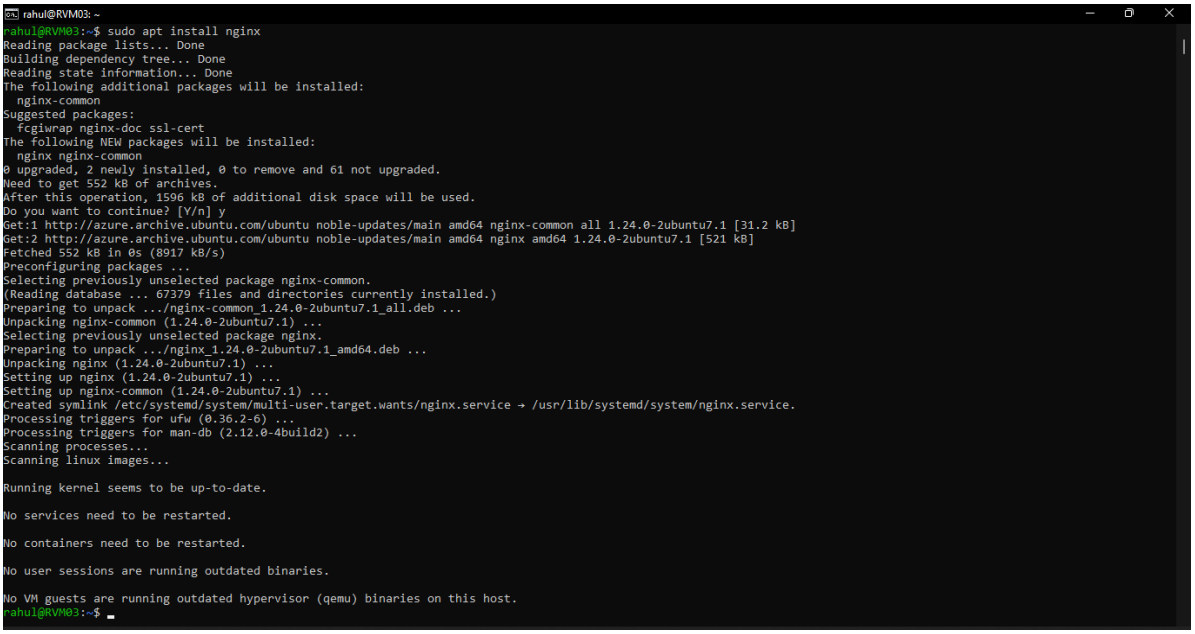
```
        ]
      },
      "osProfile": {
        "adminUsername": "rahul",
        "allowExtensionOperations": true,
        "computerNamePrefix": "vmss03",
        "linuxConfiguration": {
          "disablePasswordAuthentication": false,
          "patchSettings": {
            "assessmentMode": "ImageDefault",
            "patchMode": "ImageDefault"
          },
          "provisionVMAgent": true
        },
        "requireGuestProvisionSignal": true,
        "secrets": []
      },
      "storageProfile": {
        "diskControllerType": "SCSI",
        "imageReference": {
          "offer": "ubuntu-24_04-lts",
          "publisher": "Canonical",
          "sku": "server",
          "version": "latest"
        },
        "osDisk": {
          "caching": "ReadWrite",
          "createOption": "FromImage",
          "deleteOption": "Delete",
          "diskSizeGB": 30,
          "managedDisk": {
            "storageAccountType": "Premium_LRS"
          },
          "osType": "Linux"
        }
      },
      "timeCreated": "2024-12-24T06:16:12.1664621+00:00"
    }
  }
}
PS C:\Users\k rahul>
```



Updating the Ubuntu VMSS : (sudo apt update)



Installing nginx : (sudo install nginx)



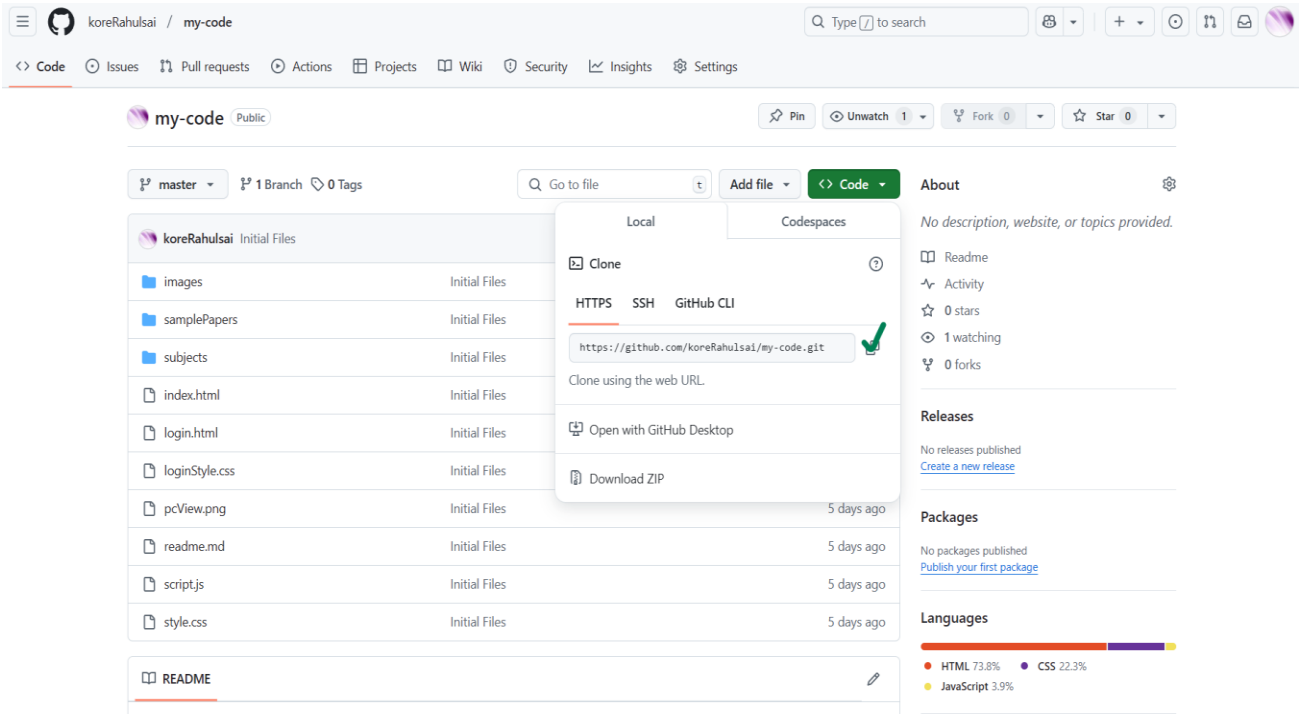
Entering in to nginx : (/ var/www.html)

```
root@RVM03:/home/rahul#
root@RVM03:/home/rahul# sudo apt install git
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
git is already the newest version (1:2.43.0-1ubuntu7.1).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@RVM03:/home/rahul# sudo rm -rf index.ngrix-debian.html
root@RVM03:/home/rahul# ls
root@RVM03:/home/rahul# git clone https://github.com/koreRahulsai/my-code.git
Cloning into 'my-code'...
remote: Enumerating objects: 126, done.
remote: Counting objects: 100% (126/126), done.
remote: Compressing objects: 100% (123/123), done.
remote: Total 126 (delta 3), reused 126 (delta 3), pack-reused 0 (from 0)
Receiving objects: 100% (126/126), 22.66 MiB | 17.79 MiB/s, done.
Resolving deltas: 100% (3/3), done.
root@RVM03:/home/rahul# ls
my-code
root@RVM03:/home/rahul#
```

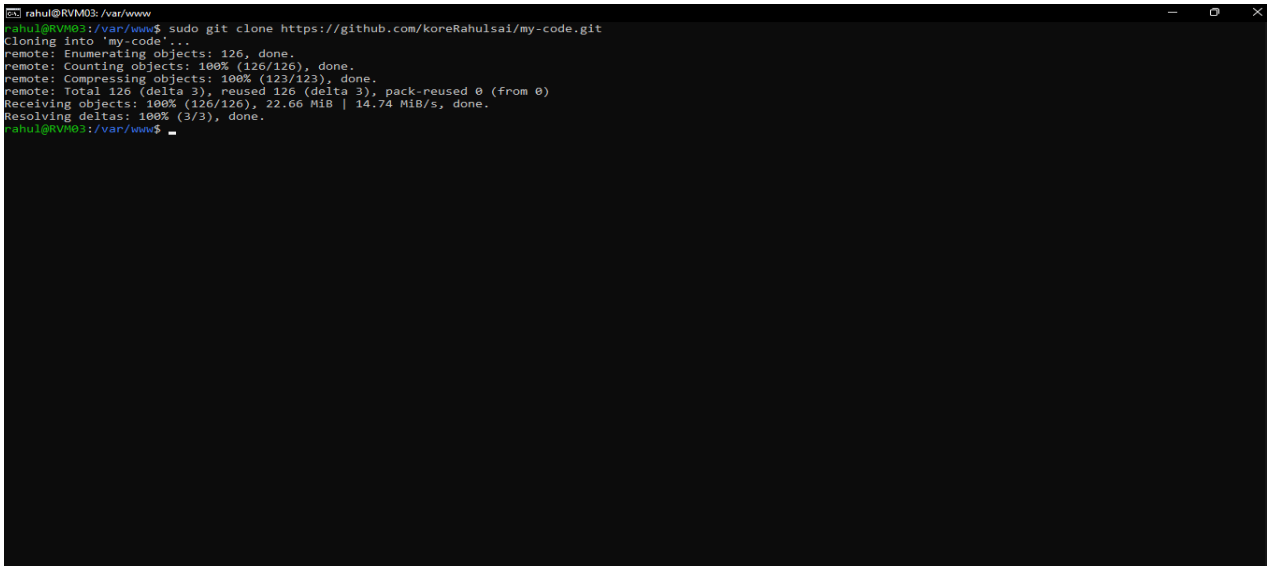
Installing Git: (sudo apt install git)

```
rahul@RVM03:~$ sudo apt install git
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
git is already the newest version (1:2.43.0-1ubuntu7.1).
git set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
rahul@RVM03:~$
```

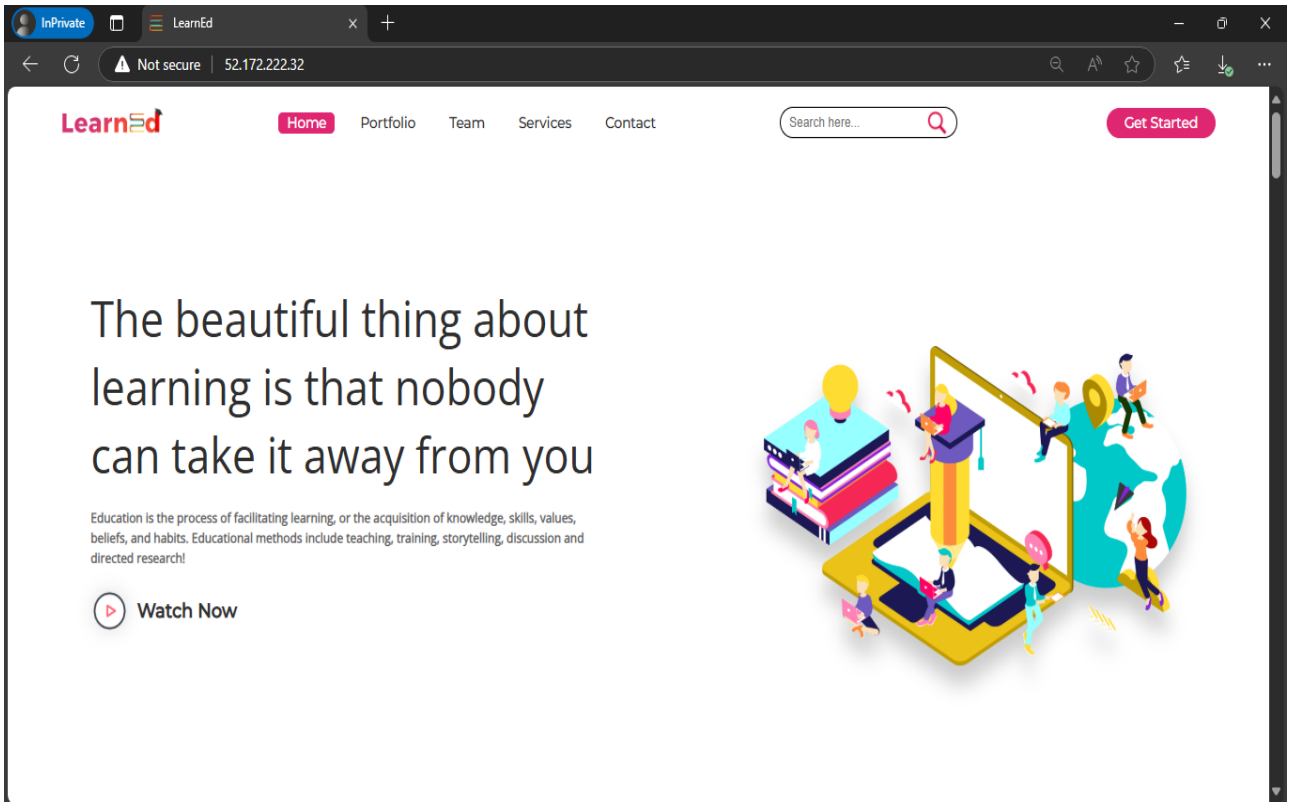
Coping of URL git :

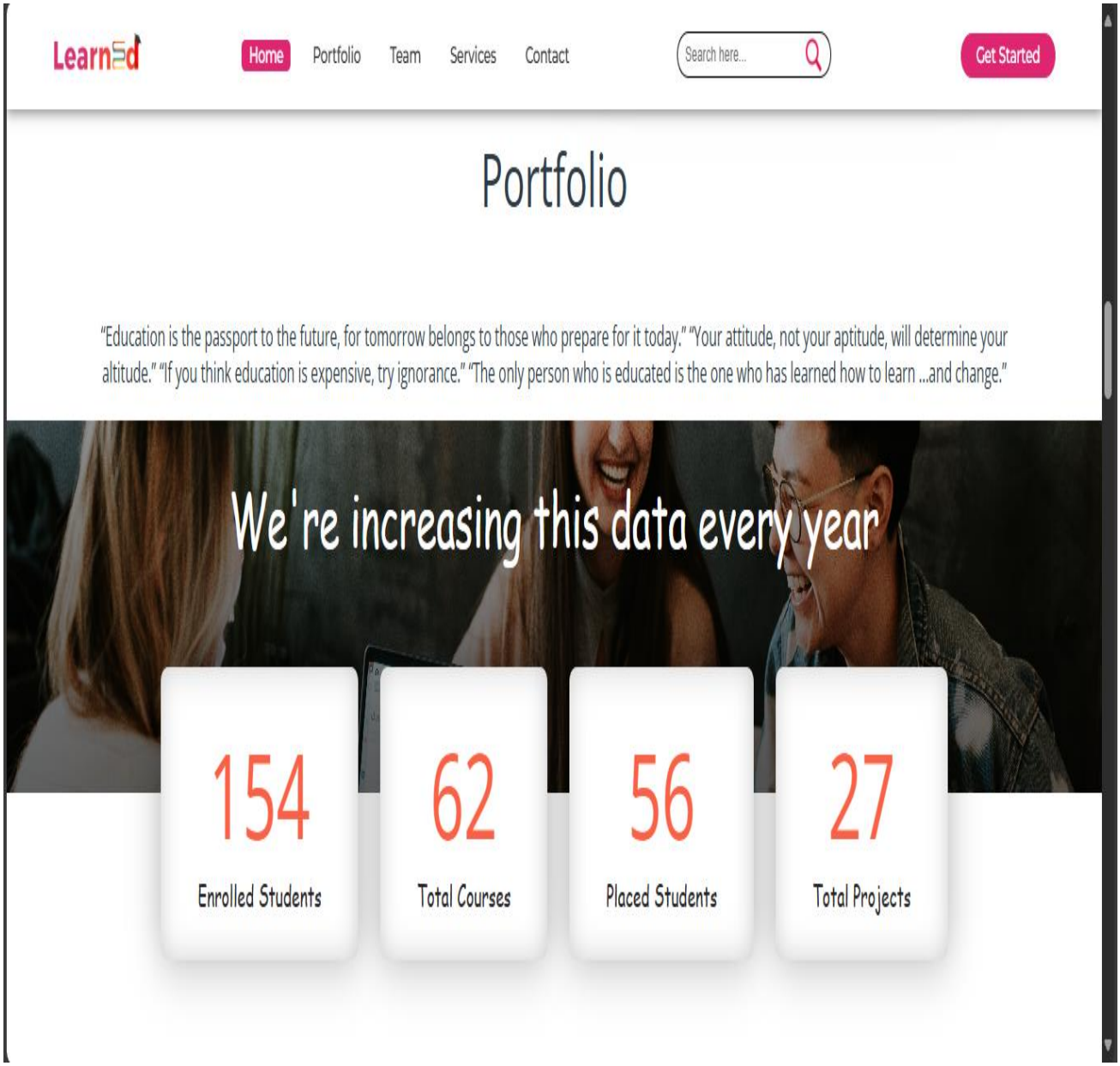


Clone the git hub repository : (Git hub clone <link>)



Web Homepage :

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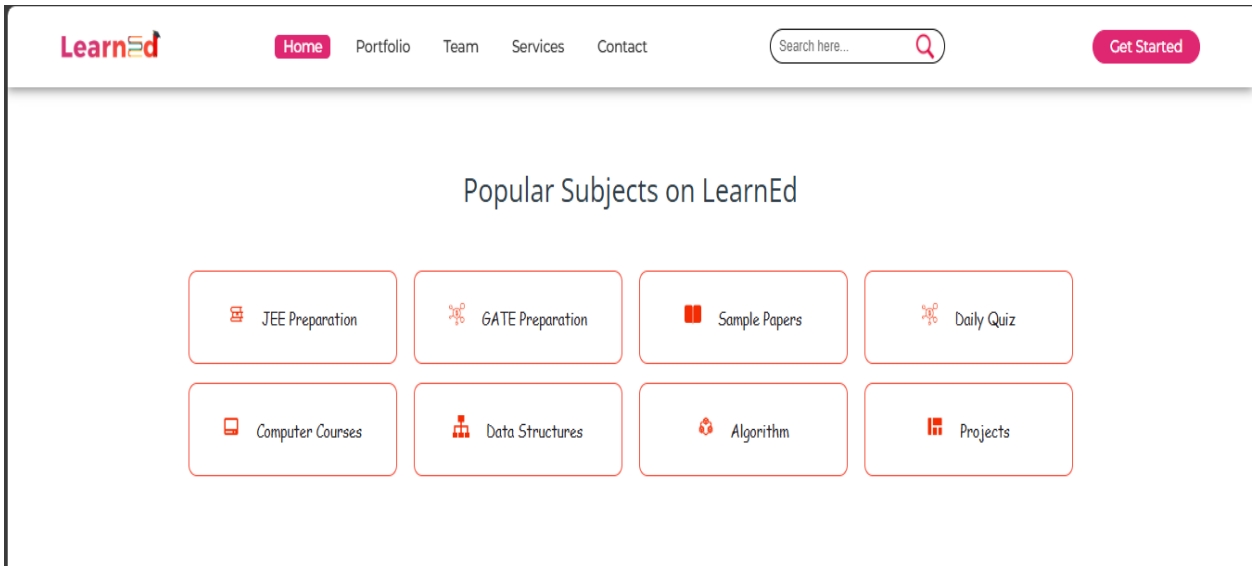
"Education is the passport to the future, for tomorrow belongs to those who prepare for it today." "Your attitude, not your aptitude, will determine your altitude." "If you think education is expensive, try ignorance." "The only person who is educated is the one who has learned how to learn ...and change."
We're increasing this data every year
154
Enrolled Students
62
Total Courses
56
Placed Students
27
Total Projects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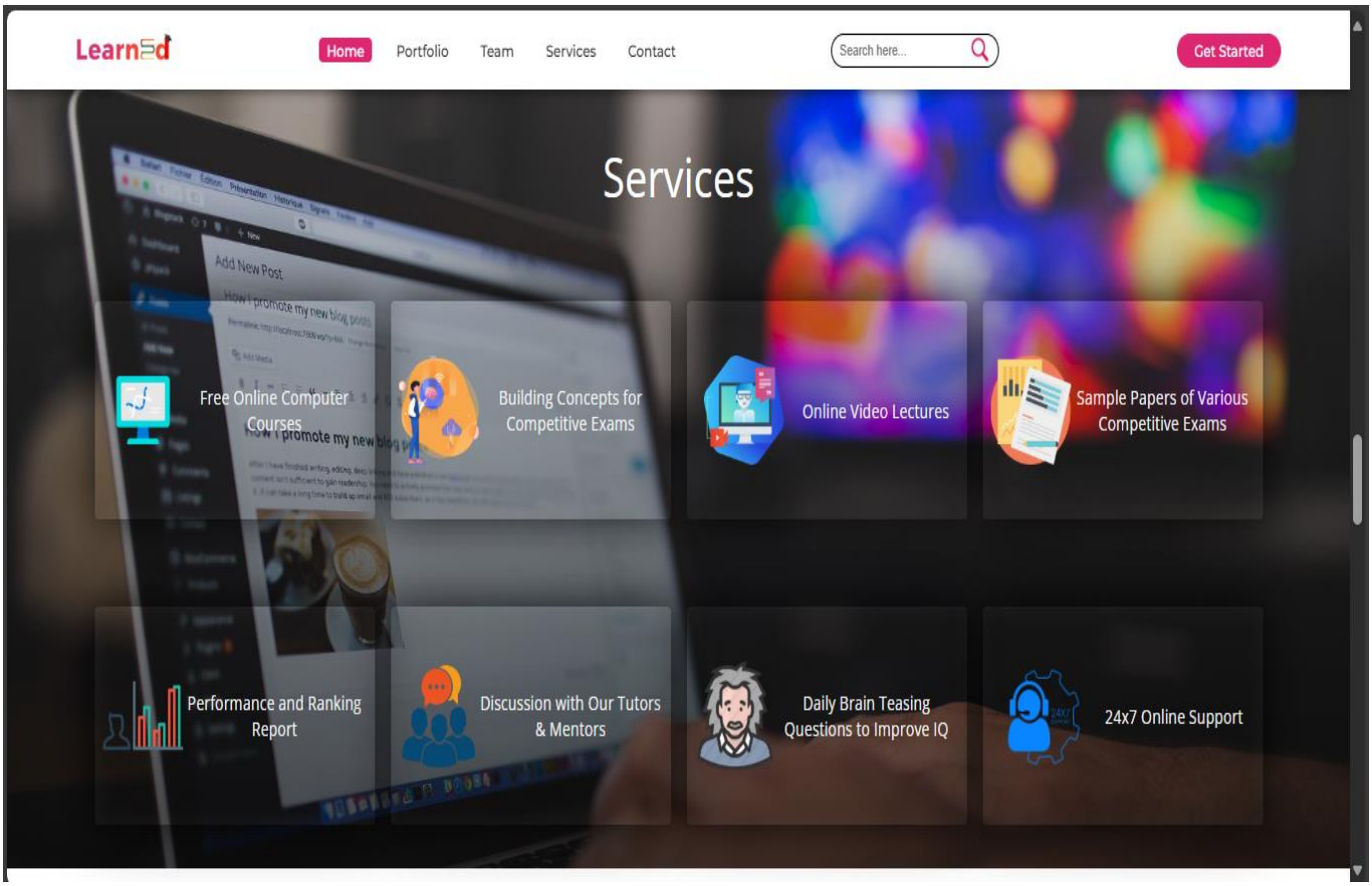
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Discussion with Our Tutors & Mentors
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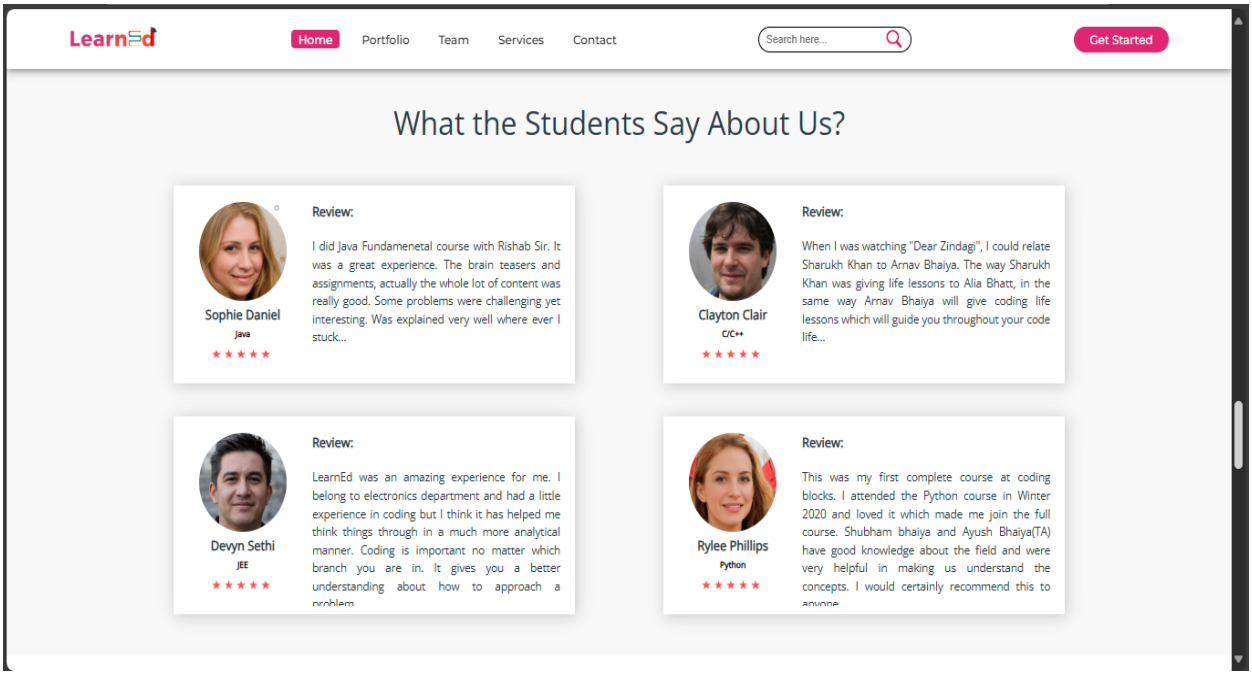
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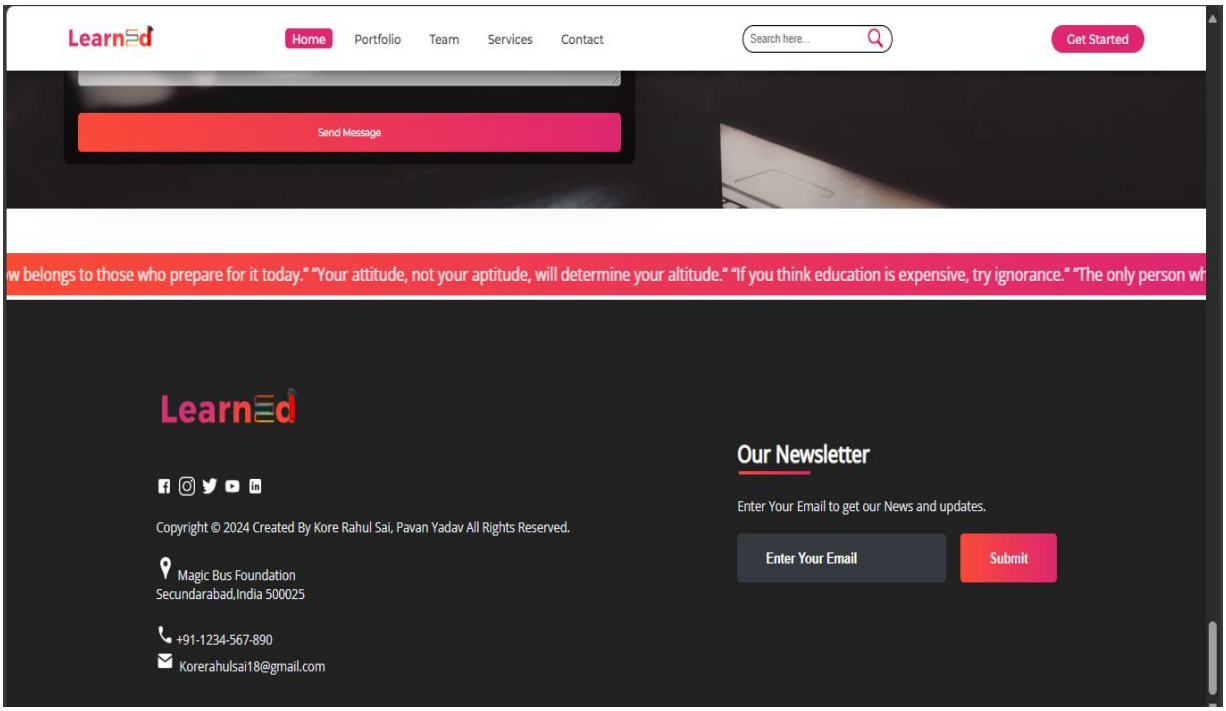
What the Students Say About Us?
Sophie Daniel
Java
Review:
I did Java Fundamenetal course with Rishab Sir. It was a great experience. The brain teasers and assignments, actually the whole lot of content was really good. Some problems were challenging yet interesting. Was explained very well where ever I stuck...
Clayton Clair
C/C++
Review:
When I was watching "Dear Zindagi", I could relate Sharukh Khan to Arnav Bhaiya. The way Sharukh Khan was giving life lessons to Alia Bhatt, in the same way Arnav Bhaiya will give coding life lessons which will guide you throughout your code life...
Devyn Sethi
JEE
Review:
LearnEd was an amazing experience for me. I belong to electronics department and had a little experience in coding but I think it has helped me think things through in a much more analytical manner. Coding is important no matter which branch you are in. It gives you a better understanding about how to approach a problem
Rylee Phillips
Python
Review:
This was my first complete course at coding blocks. I attended the Python course in Winter 2020 and loved it which made me join the full course. Shubham bhaiya and Ayush Bhaiya(TA) have good knowledge about the field and were very helpful in making us understand the concepts. I would certainly recommend this to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Conclusion :

Deploying a static website using Virtual Machine Scale Sets (VMSS) is a scalable, reliable, and cost-effective solution. VMSS ensures high availability through automatic scaling and load balancing, making it ideal for handling varying traffic demands. This approach simplifies infrastructure management, optimizes resource utilization, and provides flexibility for future growth. With VMSS, hosting a static website becomes efficient and resilient, allowing developers to focus on delivering an exceptional user experienceThis approach provides a robust infrastructure for static websites, empowering businesses to deliver consistent and reliable user experiences while maintaining operational efficiency. VMSS is not only a solution for today's needs but also a foundation for future growth and technological advancements. Deploying with VMSS demonstrates the power of leveraging cloud-native scalability to meet modern web hosting demands.