the TECH-TREASURE

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CEO ADOBE ooo

SHANTANU NARAYEN

Vision

The department aims to nurture students to be IT professionals who are innovative and technically competent to meet the advancements in industrial and societal needs.

Mission

- To produce technically competent and socially responsible graduates.
- To develop well-equipped laboratories to gain practical exposure in IT practices.
- To support research culture, consultancy work and enhancement of entrepreneurship skills.
- To enhance industry linkage for good placements and real-world exposure.
- To encourage, involve and support students for environmental and social wellbeing.

PEOs

- The graduate will be a competent professional with high-level technical proficiency in the field of Information Technology to identify problems and develop innovative solutions to meet the industrial needs.
- The graduate will exhibit professionalism, teamwork, leadership skills, and lifelong learning.
- The graduates will ethically apply their computing knowledge and skills considering societal, economic, and environmental factors.
- The graduate will be intellectually competent to pursue higher education and conduct research-oriented activities.

PSOs

- Demonstrate proficiency in one of the emerging Technology like Data Science, Machine Learning, and Web/Mobile Application Development.
- Demonstrate skills to design, develop and test software systems to provide solutions to real-world problems.

Message from HOD

We are excited to announce that the Department of Information Technology is releasing the third edition of its annual technical magazine, "Tech-Treasure," showcasing the hidden talents, skills, and abilities of our students. This magazine encourages young engineers to approach problems with creativity and originality, providing a platform for them to exhibit their literary and innovative capabilities.

Our department strives to provide the best possible learning environment for students, and this magazine serves as a resource to help them explore new technologies and stay up to date with current trends.

Through "Tech-Treasure," students can share inspirational articles, project updates, and innovative ideas to help solve real-world problems. Department is proud of the collective efforts and dedication put forth by, Prof. Naimisha Trivedi, and her team, who have brought this magazine to fruition and I extend our gratitude to all the authors for their contributions and to everyone who has supported and encouraged the project.

- Dr. Vibha D Patel
(HOD, IT)

Dr. Vibha D Patel
(HOD, IT)

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Growth of Global IT Firms

Adobe

Adobe Systems Incorporated is an American multinational computer software company incorporated in Delaware and headquartered in San Jose, California. It was founded in 1982 by John Warnock and Charles Geschke. Mr. Shantanu Narayen, a person with Indian origin is the Chairman and CEO of Adobe Inc.

Adobe is a multinational software company that provides a range of digital marketing and media solutions. The company has a rich history in developing software applications and tools, and its products are used widely across the globe by designers, developers, marketers, and other professionals.

Adobe has been in business for over three decades and has evolved into a leading IT firm in the digital media and marketing space. Its product suite includes applications such as Photoshop, Illustrator, Premiere Pro, Acrobat, and more. These tools are widely used by creative professionals and have become industry standards for graphic design, video editing, and document management.

In recent years, Adobe has expanded its offerings to include cloud-based services and digital marketing tools. The company's Creative Cloud platform allows users to access its software tools and services online, with updates and new features being rolled out regularly. Additionally, Adobe's marketing cloud offers a range of solutions for analytics, advertising, and personalization to help businesses better engage with their customers.

In September 2022, Adobe announced it has entered into a definitive merger agreement to acquire **Figma**, a leading web-first collaborative design platform, for approximately $20 billion in cash and stock. The combination of Adobe and Figma will usher in a new era of collaborative creativity. Adobe's mission is to change the world through digital experiences. Figma's mission is to help teams collaborate visually and make design accessible to all.
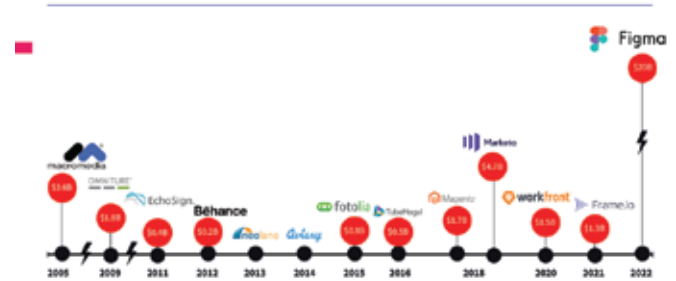
Adobe continues to lead the world in **AI** innovations designed to amplify human creativity, rather than replacing it, and uses AI to continuously optimize the world's best creative tools.
Recently Adobe unveiled powerful new AI capabilities that maximize creativity and precision across Creative Cloud apps and Adobe Express such as-
• Selection improvements in Adobe Photoshop enable users to hover over, detect and make detailed selections of complex objects with a single click, creating higher quality and more accurate selec-

tions of elements.
• Background removal in Adobe Express saves you time by using AI to detect and highlight the key subject of a photo, so you can easily place a new image into the background.
• Adaptive Presets in Adobe Lightroom are single-click enhancements unique to the photo that can quickly enhance an entire portrait, or target specific features with presets using AI.
• Adobe Substance 3D AI-Enhanced Materials workflows with new AI functionality that can create and intelligently enhance photorealistic 3D textures from either a live camera or specified images.
• Adobe Premiere Pro Auto Color applies intelligent color adjustments and accelerates color correction workflows, while Remix automatically retimes music to match the selected video clip.
• After Effects Scene Edit Detection uses AI to automatically detect scene changes in an edited video clip, then turn scenes into individual layers.

One of Adobe's most significant strengths is its commitment to innovation. The company has consistently pushed the boundaries of what is possible in the realm of digital media and marketing. It has also invested heavily in artificial intelligence and machine learning to enhance its software offerings and provide more advanced capabilities to its users.

Overall, Adobe's success as an IT firm is built on its ability to provide industry-standard software solutions, invest in cutting-edge technologies, and innovate to stay ahead of the curve. With its expanding suite of products and services, Adobe is well-positioned to continue its growth and dominance in the digital media and marketing space.

- Niraj Darji (6th Sem)

Ar

Adobe Aero , the most intuitive way to build, view and share robust immersive storytelling experiences in mobile AR. Augmented Reality bridges the physical and digital worlds. It is available on iOS and as a public beta for desktop on macOS and Windows.

Adobe AIR (Adobe Integrated Runtime) is a cross-platform runtime system currently developed by Harman International, in collaboration with Adobe Inc., for building desktop applications and mobile applications, programmed using Adobe Animate, ActionScript, and optionally Apache Flex.

Ai

Adobe Illustrator the most famous software for graphic design . It's used to create vector art, web design, 2D illustrations, and all sorts of graphic projects. There is a mobile version called Illustrator for iPad where you can sketch and layer images and drawings.

An

Adobe Animate is used to design vector graphics and animation for television series, online animation, websites, web applications, rich web applications, game development, commercials, and other interactive projects. The program also offers support for raster graphics, rich text, audio video embedding, and ActionScript 3.0 scripting. Animations may be published for HTML5, WebGL, Scalable Vector Graphics (SVG) animation and spritesheets, and legacy Flash Player (SWF) and Adobe AIR formats.

Ae

Adobe After Effects is a digital visual effects, motion graphics, and compositing application developed by Adobe Systems and used in the post-production process of film making, video games and television production. Among other things, After Effects can be used for keying, tracking, compositing, and animation. It also functions as a very basic non-linear editor, audio editor, and media transcoder.

Ps

Photoshop can edit and compose raster images in multiple layers and supports masks, alpha compositing and several color models including RGB, CMYK, CIELAB, spot color, and duotone. Photoshop uses its own PSD and PSB file formats to support these features. In addition to raster graphics, Photoshop has limited abilities to edit or render text and vector graphics (especially through clipping path for the latter), as well as 3D graphics and video.

Xd

Adobe XD creates user interfaces for mobile and web apps. This allows developers to make prototypes for apps so the interfaces can be tested before they code them. Adobe XD enables website wireframing and creating click-through prototypes. It is available for macOS and Windows, and there are versions for iOS and Android to help preview the result of work directly on mobile devices.

Adobe Sign is a cloud-based e-signature service that allows the user to send, sign, track, and manage signature processes using a browser or mobile device. It also supports Sandbox environment for Enterprise tier customers to test templates, customer workflows, and more.

Adobe Acrobat Pro is used to create, edit, organize, share or sign PDS files at your fingertips. It enables you to edit your scanned documents, create protected PDFs, and export PDFs to Microsoft Office files. Cloud storage enables you to access your Acrobat files anywhere, anytime. It is available as both desktop software and mobile app. It runs on Windows, MAC, and iPad.

Trending Technologies

Flutter

In recent years, there has been a growing demand for cross-platform app development frameworks that allow developers to create apps that work seamlessly on both Android and iOS devices. Flutter is one such framework developed by Google that has gained a lot of popularity among developers. In this article, we'll take a closer look at what Flutter is, its advantages, and how it works.

What is Flutter?

Flutter is a free and open-source mobile application development framework that was launched by Google in 2017. It allows developers to build high-performance, natively compiled applications for mobile, web, and desktop from a single codebase. The framework uses the Dart programming language, which is also developed by Google.

How does Flutter work?

Flutter works by using a reactive programming model, where the state of the app is automatically updated in response to user actions or changes to the app's data. The framework uses a widget-based architecture, where everything in the app is a widget. Widgets can be combined to create complex layouts and interactions.

Flutter also has a powerful set of tools that make development easier, such as the Flutter SDK, which includes everything needed to develop, test, and deploy Flutter apps. Additionally, Flutter has a large and active community of developers who contribute to the framework and provide support for those who are just starting out.

Advantages of Flutter

• **Fast development:** Flutter allows for fast development because it has a hot reload feature, which means that changes made to the code can be quickly seen in the app without needing to restart the application.
• **Native performance:** Flutter apps are natively compiled, which means that they can offer high performance and have a fast startup time.
• **Single codebase:** Flutter allows developers to write a singlecodebase for both Android and iOS apps, which saves time and reduces the complexity of development.
• **Easy to learn:** Dart, the programming language used by Flutter, is easy to learn for developers who are already familiar with languages like JavaScript or C#.
• **Customizable widgets:** Flutter has a library of customizable widgets that can be used to create unique and visually appealing user interfaces.

Let's create a Sidebar Menu using Flutter. It provides huge libraries and packages to design the UI. In Flutter, everything is a Widget and it provides thousands of inbuilt widgets which are very useful for any developer to design their Application easily and quickly.

In the Sidebar menu, We're using various useful widgets like,

Drawer which is used to provide access to different destinations and functionalities provided in your application. It has a horizontal movement from the edge of the Scaffold that navigates the link to different routes in the flutter app.,

ListView which is used for scrolling the List defined in our Sidebar,

DrawerHeader is the top-most region of a Material Design drawer,

BoxDecoration which provides a variety of ways to draw a box. The box has a border, a body, and may cast a boxShadow.,

DecorationImage which allows us to define a center slice, which can be used to determine how an image should be stretched to fit the target box.

```dart
class MyHomePage extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      drawer: NavDrawer(),
      appBar: AppBar(
        title: Text('Side menu'),
      ),
      body: Center(
        child: Text('Side Menu Tutorial'),
      ),
    );
  }
}
-----------------------------------------------
-----------------------------------------------
import 'package:flutter/material.dart';

class NavDrawer extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return Drawer(
      child: ListView(
        padding: EdgeInsets.zero,
        children: <Widget>[
          DrawerHeader(
            child: Text(
              'Side menu',
              style: TextStyle(color: Colors.white, fontSize: 25),
            ),
            decoration: BoxDecoration(
                color: Colors.green,
                image: DecorationImage(
                    fit: BoxFit.fill,
                    image: AssetImage('assets/images/cover.jpg'))),
          ),
          ListTile(
            leading: Icon(Icons.input),
            title: Text('Welcome'),
            onTap: () => {},
          ),
          ListTile(
            leading: Icon(Icons.verified_user),
            title: Text('Profile'),
            onTap: () => {Navigator.of(context).pop()},
          ),
          ListTile(
            leading: Icon(Icons.settings),
            title: Text('Settings'),
            onTap: () => {Navigator.of(context).pop()},
          ),
          ListTile(
            leading: Icon(Icons.border_color),
            title: Text('Feedback'),
            onTap: () => {Navigator.of(context).pop()},
          ),
          ListTile(
            leading: Icon(Icons.exit_to_app),
            title: Text('Logout'),
            onTap: () => {Navigator.of(context).pop()},
          ),
        ],
      ),
    );
  }
}
```


- Dhruvil Bhojani (6th Sem)
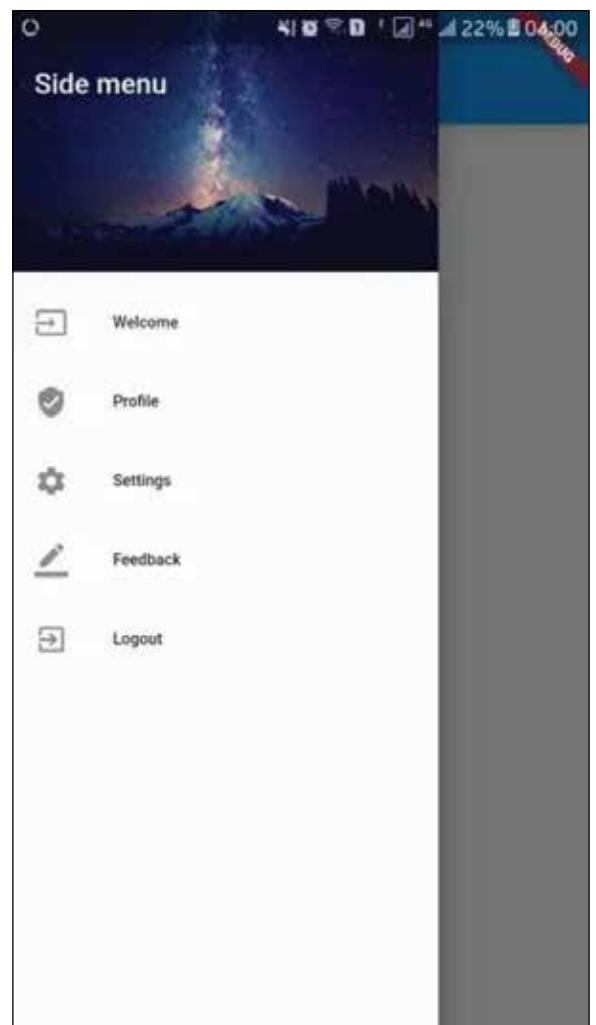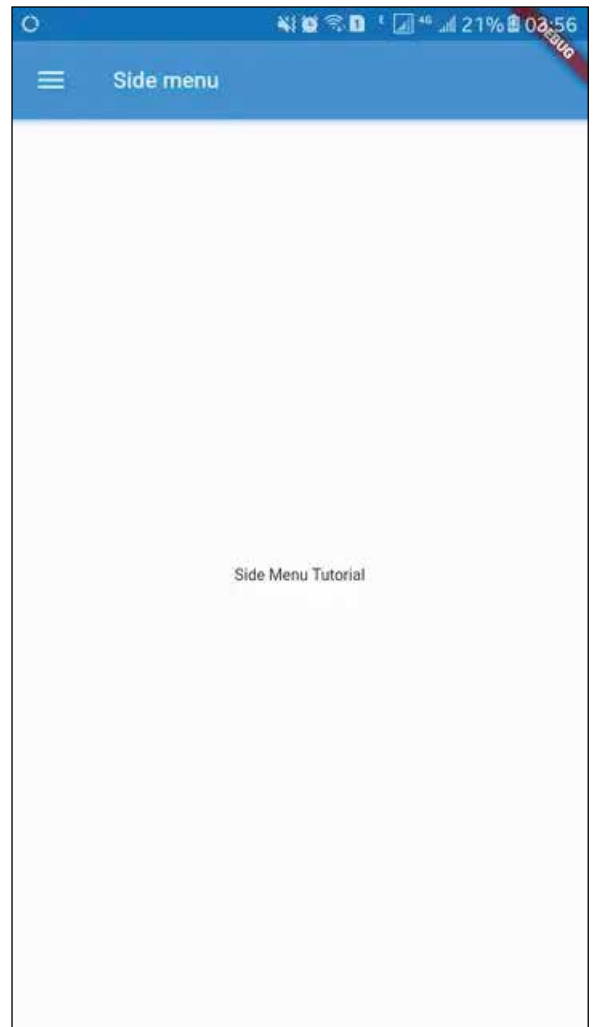
"Everything on Mobile" era

5G technology is the next-generation cellular network technology that will bring faster internet speeds, lower latency, and greater bandwidth. It is designed to connect people, machines, and devices in a more seamless and efficient way than ever before. 5G technology uses a range of frequencies to provide faster speeds, including low-band, mid-band, and high-band or millimeter-wave frequencies.

In the "Everything on Mobile" era, mobile networks must meet more diverse requirements than ever. The 5G is expected to globally redefine a range of industries such as transport, healthcare and logistics. Wherein 5G would give benefits to mobile users; it is also helping the cities in the world to become Smart Cities by deploying various technologies and Framework so that the cities can achieve smart urban growth.

5G communications aims to give better capacity, connectivity and coverage than previous generations because the main problems with them were lack of coverage, dropped calls and low performance of cell edges. A new term WWWW which is the world wide wireless web is being associated with 5G where there will be no limitation of wireless network.

How does 5G work?

Wireless communications systems use radio frequencies (spectrum) to carry information through the air.
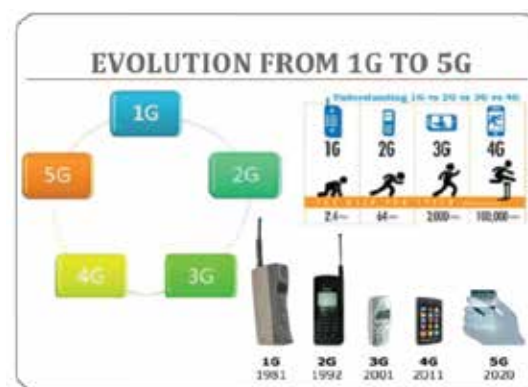
5G operates in the same way, but uses higher radio frequencies that are less cluttered. This allows for it to carry more information at a much faster rate. These higher bands are called millimeter waves (mm waves).

While higher bands are faster at carrying information, there can be problems in sending data over large distances`.

The signals can be easily blocked by physical objects. In order to circumvent this challenge, 5G will utilize multiple input and output antennas to boost signals and capacity across the wireless network.

The technology will also use smaller transmitters placed on buildings and street furniture, as opposed to using single stand-alone masts. Current estimates say that 5G will be able to support up to 1,000 more devices per meter than 4G.

The implementation of 5G is inclined to meet the following 3 requirements: -

- Massive Broadband (xMBB) to deliver gigabytes of bandwidth
- Massive Machine Type Communication (mMTC) to connect billions of servers and machines
- Critical Machine Type Communication (uMTC) providing   high reliability and remote control

Features and Advantages:

The benefits of 5G technology are numerous and far-reaching. With faster data speeds and lower latency, 5G technology is expected to revolutionize many industries, including healthcare, transportation, entertainment, and manufacturing. Some of the key benefits of 5G technology include:

Faster download and upload speeds
Higher connection speed is THE benefit of 5G. While 4G theoretically tops out at 100 Mbps, 5G has the potential to reach speeds of 10 Gbps – a 100x improvement.

Greater network capacity
Estimates suggest that 5G deployments can support a million connected devices per 0.38 square miles compared to 4G's 2,000.

Improved reliability and security
5G employs multi-access edge computing technology that distributes large data loads and decongests networks through localized computing. This ensures that connections are not broken or interrupted when usage spikes.

Lower Latency
5G does away with this limitation – it can bring down latency to less than 5 milliseconds. In comparison, 4G suffers a latency of over 60 milliseconds.

Network slicing
Network slicing is a practice that allows multiple virtual networks to be created and operated on top of a dedicated platform running on shared physical infrastructure – sort of a private network for businesses.

Applications and Use cases of 5G

The applications of 5G technology are wide-ranging and diverse. Here are some of the ways in which 5G technology is expected to transform various industries:

Harnessing the Power of IoT
5G's promise of low latency and high network capacity helps to eliminate the biggest limitations to IoT expansion. Giving devices nearly real-time ability to sense and respond, 5G and IoT are a natural pairing that will impact nearly every industry and consumer.

Unleashing AI
5G will help enable AI inference at the edge and it will also play a role in delivering data from devices to the central cloud to train or refine AI models. For example, real-world data about road conditions collected by connected vehicles can improve cloud-based mapping services.

Healthcare
5G technology has the potential to revolutionize healthcare by enabling remote monitoring and treatment, as well as facilitating the use of advanced medical technologies such as robotic surgery. With the faster speeds and low latency of 5G networks, healthcare providers can perform complex procedures remotely, and patients can receive medical care without leaving their homes.

Transportation
5G technology will play a significant role in the future of transportation, from enabling autonomous vehicles to improving traffic flow and reducing accidents. With the greater network capacity and faster speeds of 5G networks, vehicles can communicate with each other and with the infrastructure in real-time, allowing for safer and more efficient transportation.

Entertainment
5G technology will transform the way we consume entertainment, from streaming high-quality video content to playing immersive virtual and augmented reality games. The low latency rates and faster speeds of 5G networks make it possible to deliver a more seamless and immersive entertainment experience.

Manufacturing
5G technology will revolutionize manufacturing by enabling the use of advanced technologies such as the Internet of Things (IoT) and Artificial Intelligence (AI). With the greater network capacity and faster speeds of 5G networks, manufacturers can connect and control large numbers of devices in real-time, leading to greater efficiency and productivity.

- Shreyash Detroja, Dhrumil Ponkiya (6th Sem)

Dark Web

Abstract

The dark web is a hidden part of the internet that can only be accessed using special software, and it presents challenges and opportunities for those seeking to gather information or track online activities. OSINT, or open-source intelligence, can be a valuable tool for law enforcement, security professionals, and researchers to gain insights into illegal activities on the dark web. However, the use of OSINT on the dark web requires specialized skills and tools, and there are legal and ethical considerations to take into account. Understanding the intersection of the dark web and the digital world is essential for anyone seeking to navigate this complex landscape.

The dark web is a portion of the internet that is not indexed by search engines and can only be accessed using special software, configurations, or authorization. It provides users with a high level of anonymity and privacy, which can be used for legitimate purposes as well as illegal activities.

The deep web refers to all the content on the internet that is not indexed by search engines, including both legal and illegal content. The dark web is a subset of the deep web that is intentionally hidden and requires specific software, configurations, or authorization to access. Sometimes the terms "deep web" and "dark web" are used interchangeably, which can cause confusion, but they actually refer to different things.

The dark web includes various types of darknets, ranging from small, private networks to larger, more popular networks such as Tor, Freenet, I2P, and Riffle. These networks are operated by both public organizations and individuals, and they provide users with varying levels of anonymity and privacy.

The Dark Web uses sophisticated anonymity systems to conceal a user's IP address and identity, and is typically accessed through dedicated software such as Tor. This makes it difficult to track a user's online activity and the websites they visit.

Under the network's top-level domain suffix, the onion routing traffic anonymization technology is used on the Tor hidden web, also known as onionland. onion.

Tor

The Onion Routing project was launched in 1996. It was developed by the US Naval Research Laboratory (NRL) as a way to create anonymous internet connections that would not reveal the identity of the users or the content of their communication. The project eventually evolved into what is now known as the Tor (The Onion Router) network.

What does Tor Do?

Tor is not the "Dark Web" itself, but rather a tool that can be used to access both the "Open Web" and the "Dark Web" while providing anonymity and privacy to the user.

Tor is an implementation of onion routing, which encrypts and randomly bounces communications through a network of relays operated by volunteers around the world. This makes it difficult for anyone to trace the path of the communication or identify the sender or recipient. The use of a network of relays also provides an additional layer of security by making it difficult for any one relay to monitor the entire communication.

As a result, the IP address of the sender and the recipient are not both in cleartext at any hop along the way, making it difficult for anyone eavesdropping on the communication channel to identify both ends of the communication.

One of the key features of Tor is that to the recipient of the communication, it appears that the last Tor node (called the exit node) is the originator of the communication, rather than the sender.

However, it's worth noting that the exit node can potentially see the unencrypted traffic that is exiting the Tor network, so it's important for users to use end-to-end encryption (such as HTTPS) for sensitive communications.
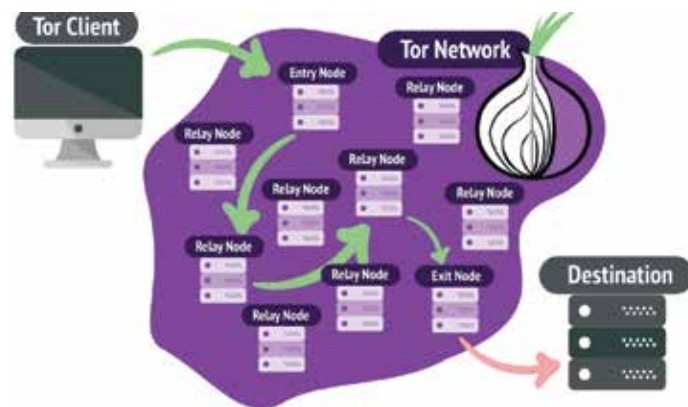
Tor Browser Search Engines

- Torch
- DuckDuckGo
- Ahmia
- Recon
- OnionSearch
- Haystak
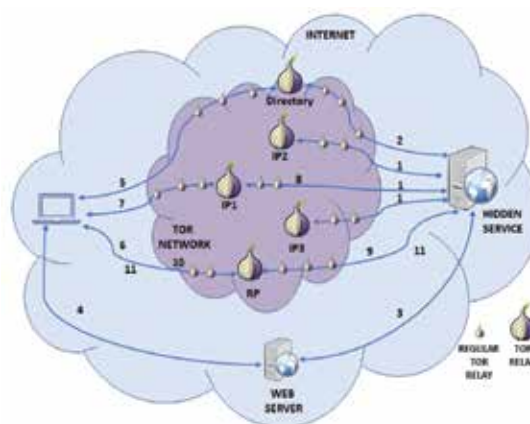
Tor Hidden Services Goal:

Tor Hidden Services provide a way for websites and services to be hosted anonymously on the Tor network.

1. Access - Control: Tor Hidden Service can limit incoming requests in various ways to prevent flooding attacks by attackers and can use various authentication mechanisms to control access to the service and prevent unauthorized access.

2. Robustness: It refers to the ability of the service to remain operational and accessible even in the face of various challenges or attacks.

3. Smear - resistance: It refer to the ability of the service to resist attempts to discredit it or its content. It requires that the service itself is designed and operated with integrity and transparency, and that its content and services are legal and ethical.

4. Application transparency: It means that users should be able to understand how the service is using their data, and should have control over what data is collected and how it is used. It is important for protecting user privacy and ensuring that users can trust the service.

- Jenil Kheni, Himanshu Dodiya (6th Sem)
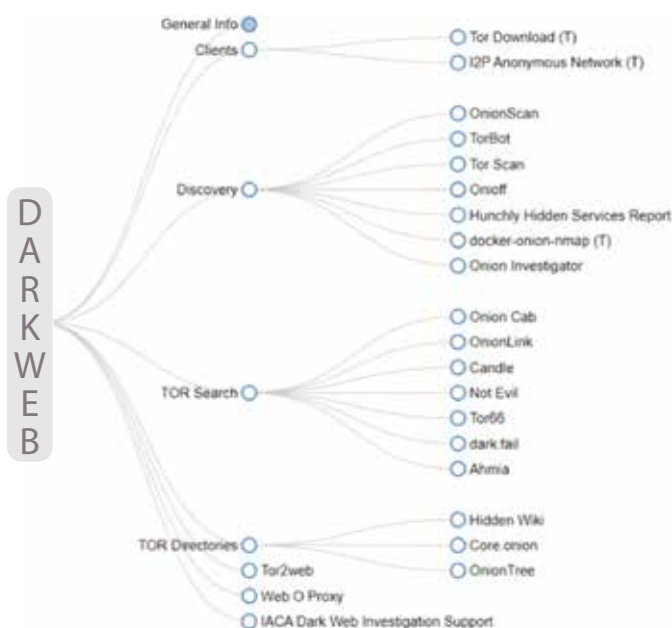
AI in Automation

Abstract

Testers find it tough and time consuming to scan whole outcome test file for specific data. So, to save their precious time we made it simpler for them by demonstrating all characteristics in one dashboard. Hence, we have developed DasHack in summer internship by using streamlit which is a python-based framework used to create beautiful interactive website. The DasHack is a modern in-demand product for automation testing. It is a Dashboard Hack with all-in-one aspect. From illustrating test cases to bifurcating, them into success, failure and skipped cases. Displaying reason for failure test case, comparing files, displaying history, etc. are its features.
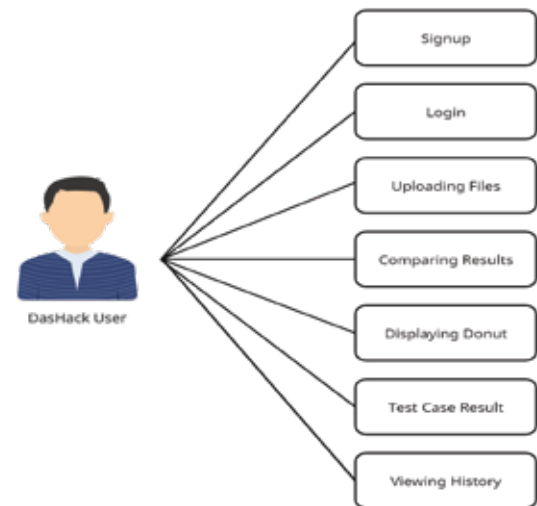
Introduction

DasHack is a tool that extracts data from testing files and displays it in a formatted way with just one click, solving difficulties in displaying testing outcomes for automation testers. It was developed with reference to Calliope.pro and displays required data about XML or JSON files generated as output by Selenium projects used for website automation testing. DasHack's features include illustrating test cases, bifurcating them into success, failure, and skipped cases, displaying the reason for failure test cases, comparing files, displaying history, etc. The tool uses the Streamlit web app framework, and users can sign up to utilize it.

DasHack's website was built using the Streamlit web app framework, a python-based tool for building dashboards. CSS was used for designing the website.

Prototype: -
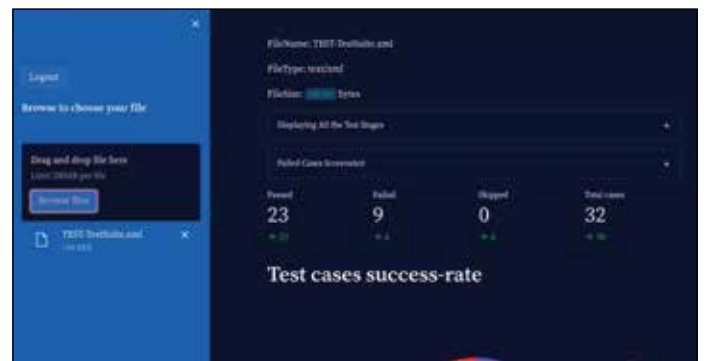
Conclusion: -
DasHack is a useful tool for automation testers as it displays required data in a formatted way, making it easy to understand testing files. It includes features such as illustrating test cases, bifurcating them into success, failure, and skipped cases, displaying the reason for failure test cases, comparing files, displaying history, displaying donut charts, etc. Users can sign up to utilize this web app.

Future scope: -
In the future, DasHack could add the feature of outputting screenshots for failed or skipped test cases along with the reason, making it easier for users to understand the problems. Additionally, machine learning and natural language processing (NLP) techniques could be used to solve XPath errors, which occur when the wrong path is given to the file and the program is unable to locate it. By utilizing machine learning, these errors can be solved automatically.

- Jap Hirpara (8th Sem)

MilkPrism

Small dairy owners face challenges in expanding their businesses due to competition in the market, while shopkeepers struggle to manage customer accounts and records. Customers also encounter difficulties in finding the right shop for their needs.
Hence there arises a need for some proper system to cater all the problems.

Milkprism is a system that helps small dairy owners manage their businesses more efficiently. Shopkeepers can maintain customer records, create and distribute bills, and hire delivery personnel using the website. The system simplifies the shopkeeper's offline process and converts it into an online process, reducing manual record-keeping.

One potential solution to this problem is to explore online milk delivery services, which allow customers to place orders for milk and other dairy products online and have them delivered to their doorstep on a regular basis. This can save customers time and effort, and also provide more transparent pricing and easier communication with the service provider. It's also possible to search for online reviews to find a reputable service provider nearby.

Milkprism offers daily doorstep delivery and easy communication with shopkeepers through their website, eliminating the need for daily visits to the shop. Customers can choose from shops around them based on ratings from other customers and can track their order history.

Characteristics of MilkPrism

• The user can use a search function to find a suitable shop based on their needs and reviews from other users. They can then subscribe to receive monthly milk deliveries from the chosen shopkeeper.

• Shopkeepers can easily store and manage all their documents and records related to customers, such as invoices, receipts, purchase orders, and inventory levels.

• By generating monthly bills for customers and keeping track of their payment history, the shopkeeper can have a better understanding of their finances and ensure that payments are made promptly.

• Our system facilitates customer communication with the shopkeeper for delivery-related issues and order edits, and also allows customers to provide feedback and reviews to both the shop and our website.

• All shops on our website will be verified by the admin before they are listed. Only verified shops will be featured on our website.

• A website-based system can be flexible enough for its users to access from anywhere and at any time, as long as they have an internet connection and a device with a web browser.
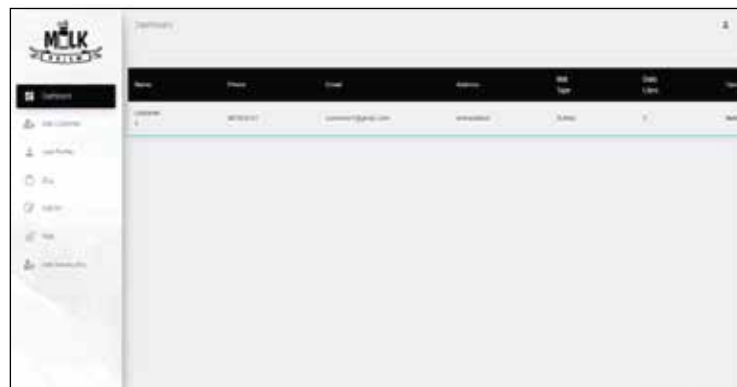

Home Page
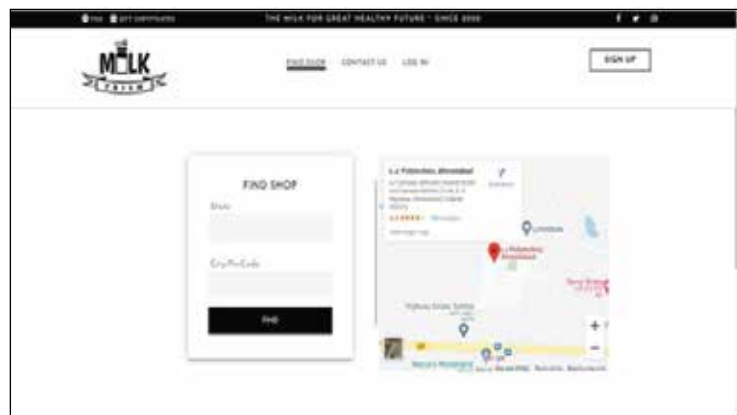
Find Shop

Admin Dashboard

Shopkeeper Dashboard

- Yaksh Bhesaniya (6ᵗʰ Sem)

BharatBhasya - A Speech Processing tool

Synopsis Abstract:

A web application which consists of a speech processing tool that recognizes input audio language and converts this voice data into the text form of any desired language. Cyber cell's officers can use this application to communicate with suspects/criminals by reading their different language speech's converted text into the officer's regional language. The authorized officer can also access the data of any specific case with all of its details which was gathered during the interogation session. Officer can tag the required term to any case for his/her reference and hence any similar case can also be accessed in future with the help of these keywords.

This data will be stored in the database with the respective case details. The system enables keyword tagging and based on clustering of keywords it will help in searching similar types of cases from the present case database for detailed investigation/Analysis of current cases. The whole system can be used in many of the indian constitutional language and can also store the investigation data digitally.

Literature Review:

There are speech processing tools that can suffice the need of voice to text issues but they are not commercially viable. Also, there are no publicly available platforms that are customized for security agency's requirements and they do not solve the issue of language barrier with respect to our nation's needs. There are some voice to text translation tools available like google translate which is not designed specifically to address the problem of security agencies. These available tools do not provide all Indian regional languages.

## Approach to solve the problem:

To develop an application that is commercially viable for solving the problem of speech (voice) to text from the viewpoint of a common non-tech end user, giving them a proper platform to use speech to text functionality effectively with a multi language support system. As a solution, a web application is made which uses a simple approach for translating speech (voice) to text and also focuses on reducing the paperwork as the data will be stored in a database which will be done in a secured manner.

## Tools and technologies to be used:

To develop this web based application, HTML, CSS, Bootstrap and JavaScript are used as frontend, MongoDB as database, Flask and Python as the backend. There are dependencies needed in the implementation for conversion hence Google Cloud Platform (GCP) is used. The system will support 11 Indian regional languages and 100 other languages for speech to text and text to speech conversions. Hence the system provides 110 languages in total. Also, machine learning is used for keyword tagging.

Possible outcome:

This application will translate speech (voice) to text in the desired language and targets 11 Indian regional languages and a total 110 languages are supported. It also stores the session conversion details with the respective case details of the security agency. Besides this, core conversion functionality and data management functionality is also provided so that users can create, update and manage all the case related data. Desired application reduces the paperwork of the security agency and stores data digitally with encryption.
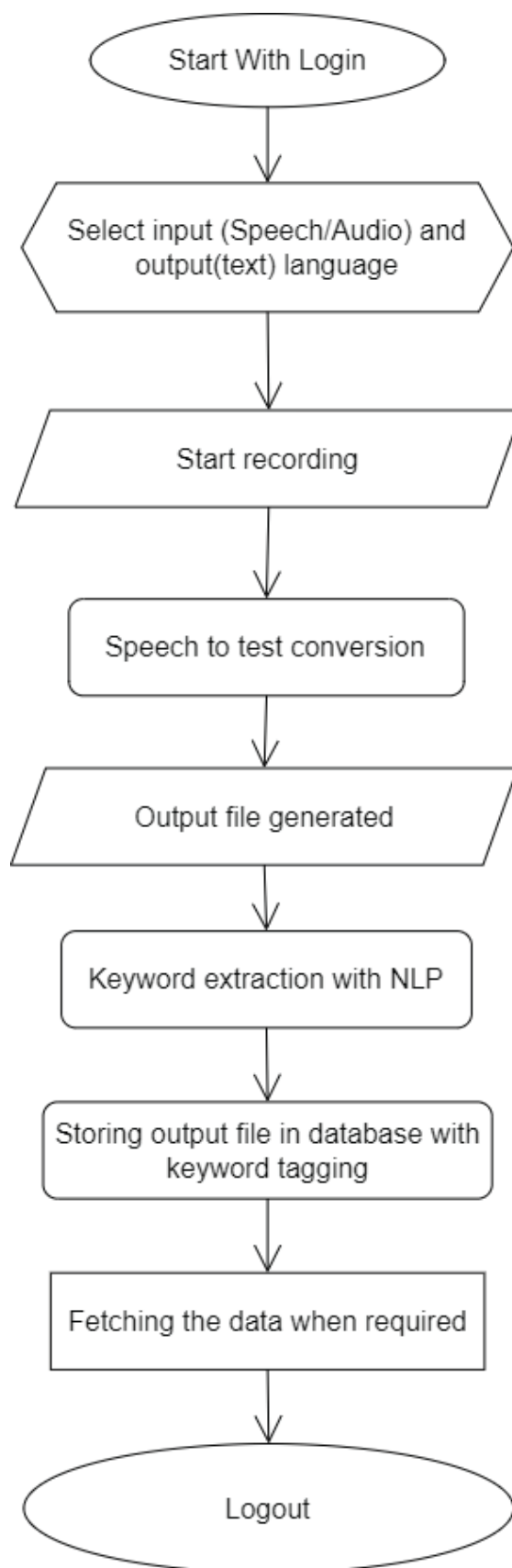
BharatBhasya Website
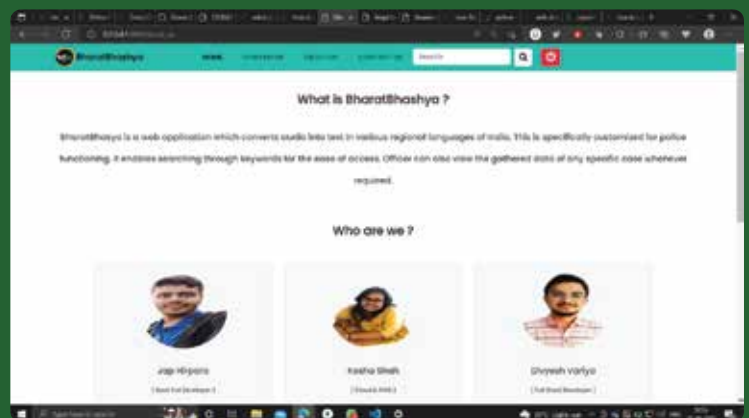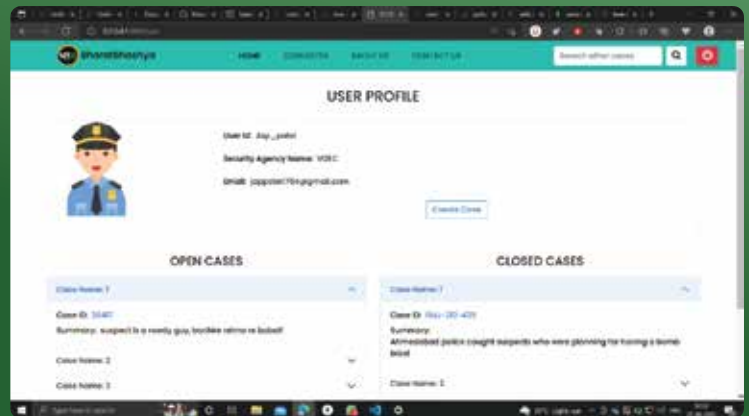
- Team Abhimanyu
Jap Hirpara, Kesha Shah, Vishal Prajapati, Tanvi Zankat, Jayshree Vanpariya, Divyesh Varia (8ᵗʰ Sem)
Mentors: Prof. Jasvant Dave, Prof. Nikunj gamit
Selected for Grand Finale Round of Smart India Hackathon 2022 at Lovely Professional University(LPU),Punjab

Traffic Sign Classification Web-App

Abstract

The project is a traffic sign classification web application that allows users to upload an image of a traffic sign or use a camera in their vehicle to classify the sign and receive predictions of the traffic sign's name. It also includes a module to notify the user during driving about upcoming traffic signs and help them understand and follow them. The application can be accessed through any browser.

Architecture

We are using the MobileNetV2 architecture, which is a convolutional neural network designed to perform well on mobile devices. It is based on an inverted residual structure, where residual connections are between the bottleneck layers. MobileNet supports input sizes greater than 32 x 32.

In MobileNetV2, there are two types of blocks: residual blocks with a stride of 1, and blocks with a stride of 2 for downsizing. Both types of blocks have three layers.

• The first layer is a 1×1 convolution with ReLU6.

• The second layer is a depthwise convolution.

• The third layer is another 1×1 convolution without any non-linearity.

It is claimed that using ReLU again will result in deep networks only having the power of a linear classifier on the non-zero volume part of the output domain.
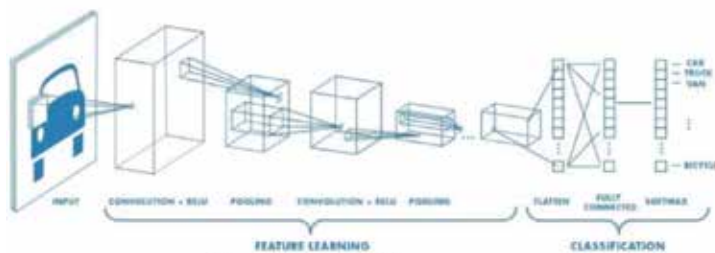

Figure 1. MobilenetV2 Architecture

Tools & Technologies

No	Tools & Library Name	Usage
1	Keras	We are using for deep learning tasks like creating model, predicting the object etc.
2	Pillow	Pillow we are using for preprocessing the images of our dataset.
3	Streamit	It is backend framework for developing the web application.
4	Pandas	We are using it for data analysis and associated manipulation of tabular data in DataFrames.
5	Numpy	We are using it for the Image matrix handling.

Dataset

In this project, we are using the "Traffic Sign Image Recognition" dataset, which has 36 classes and almost 100 images for each class. This means we have over 3600 training images. We have 10 images for each category in the train/validation set.

Workflow

In this project, we will demonstrate how our web application works. We have divided our modules, making our tasks easier. Our frontend and backend will be handled by Streamlit. As a normal user, they can visit our application by entering the URL. Once there, they will see an upload button to upload an image. After uploading the image, our system will automatically perform the necessary tasks.

The user will upload an image, which will be stored on the local system. Next, Pillow will resize the image according to our model's shape and convert it into a vector. This vector will be passed to our model, which will classify the category of the image. We will get the ID of the category and map the ID to its corresponding label.

Our system will then web-scrape the calories for the predicted object. Finally, our application will display the result and the calories on the user's screen.

- Denis Sjingala (8th Sem)

It's unfortunate to hear that there are a large number of stray animals and unreported animal injury cases in India. The government's effort to provide an animal helpline number (1962) and mobile veterinary services (Pashu Davakhana) is a step towards addressing the issue.

The recent outbreak of lumpy virus disease in cattle is a cause of concern and requires immediate attention from the veterinary authorities to prevent its spread and protect the affected animals.
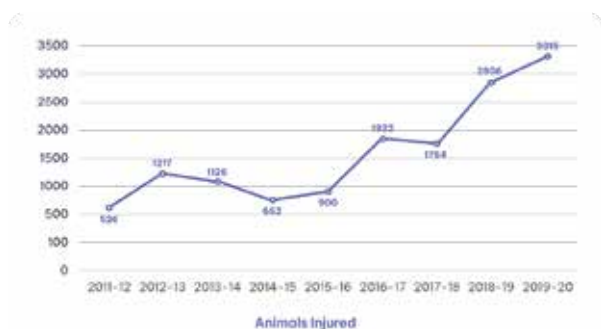
As the graph shows an increase in animal injury cases every year, Our NearestVet application can be particularly helpful in addressing this trend. By providing quick and easy access to veterinary care, also can help pet owners get their pets the necessary treatment as quickly as possible, which can increase the chances of a positive outcome.

In addition, Our NearestVet application offers the features such as appointment scheduling, finding nearest vet to get fastest treatment for the pet. By using these features, pet owners can stay on top of their pets' health needs and ensure that they are receiving the best possible care.

• Features for Pet owners

Posting a complaint of Animal Injury/Disease with Image Capture:

This feature can help users report cases of animal injury or disease with supporting visual evidence to better understand the issue and address it effectively.

Automatic case allocation to the nearest vet:

With this feature, users can receive prompt attention from the nearest veterinary professional, and animals can receive timely treatment.

Notification on status change of the complaint reported:

This feature can help users stay informed of their complaint's progress and know when it's resolved.

Status Tracking of Complaints:

This feature can help users track their complaints and provide transparency in the resolution process.

False complaint filtering based on Image Analysis through Machine Learning:

This feature can help filter out fake complaints and prioritize real ones that require attention.

Location-based notification on severe outbreaks of any disease:

With this feature, users can receive timely alerts on severe outbreaks of any disease, which can help prevent further spread and ensure appropriate treatment is administered.

• Features for Vets

Details of complaints assigned:

This feature can help the vet get a quick overview of the animal welfare cases assigned to them, allowing them to prioritize their workflow.

Add new case details:

With this feature, vets can add new case details, ensuring they capture all necessary information related to the animal's injury or disease.

Generate report:

This feature can help the vet generate reports on cases they've worked on, which can be useful in keeping track of their work, billing, and general statistics.

Add visit details for complaints:

This feature can help the vet keep track of their visits to the animals under their care, enabling them to provide better follow-up care.

Notification to the nearest vet available in addition to the in-charge of the area:

With this feature, the vet can notify other vets in the area if they are not available to attend to a particular case, ensuring timely attention to the animal's welfare.

Check today's scheduled visits:

This feature can help the vet plan their day better by knowing what cases they need to attend to on a particular day.

Conclusion:

The NearestVet application offers pet owners numerous benefits, including convenience, accessibility, and better care for their pets. With its user-friendly interface and location-based technology, the app enables pet owners to quickly and easily find a nearby veterinarian, which can be particularly useful in emergencies or time-sensitive situations. The app also helps pet owners who may not have access to a regular veterinarian or who are traveling with their pets. By connecting pet owners with qualified veterinarians in their area, the NearestVet app promotes better care for pets. Finally, the app saves time for both pet owners and veterinarians by streamlining the appointment scheduling process and ensuring that veterinarians can efficiently manage their patient load. Overall, the NearestVet app provides a valuable tool for pet owners who want to ensure the health and well-being of their furry companions.

- Dharmit Shah, Bhavika Balasra, Abhi Shah, Vaishnavi Barot, Diti Soni, Mihir Someshwara (8th Sem)

Aptitude

1

```c
What will be the output of the program?
#include<stdio.h>
int main()
{
    int a = 500, b = 100, c;
    if(!a >= 400)
        b = 300;
    c = 200;
    printf("b = %d c = %d\n", b, c);
    return 0;
}
```

2

```c
What is the output of this C code?
#include <stdio.h>
int main()
{
    float f = 0.1;
    if (f == 0.1)
        printf("True");
    else
        printf("False");
}
```

3

```c
What will be the output of the program ?
#include<stdio.h>
int main()
{
    int a[5] = {5, 1, 15, 20, 25};
    int i, j, m;
    i = ++a[1];
    j = a[1]++;
    m = a[i++];
    printf("%d, %d, %d", i, j, m);
    return 0;
}
```

4

```c
What do the following declaration signify?
int (*pf)();
```

5

```c
What will be the output of the program?
#include<stdio.h>
int main()
{
    float a = 0.7;
    if(0.7 > a)
        printf("Hi\n");
    else
        printf("Hello\n");
    return 0;
}
```

6

```c
What will be the output of the following
code snippet?
#include <stdio.h>
void solve() {
    int a = 3;
    int res = a++ + ++a + a++ + ++a;
    printf("%d", res);
}
int main() {
    solve();
    return 0;
}
```

7

```c
What will be the output of the following
code snippet?
#include <stdio.h>
#define CUBE(x) x * x * x
void solve() {
    int ans = 216 / CUBE(3);
    printf("%d", ans);
}
int main() {
    solve();
    return 0;
}
```
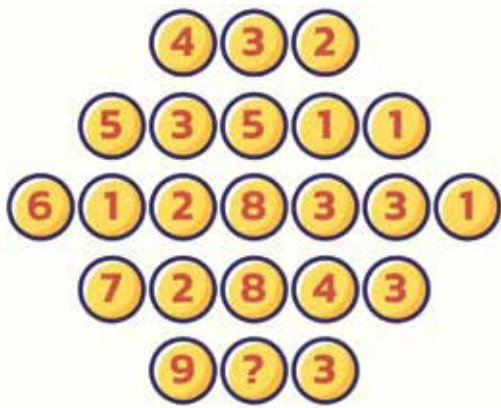
- Sujal Mandalia (6th Sem)

b=100 ,c=garbage | false | 3, 2, 15 | pf is a pointer to a function which return int | Hi | 20 | 648

1. What is the missing number in the circle?

6. What is the missing number in the circle?

Monday = 617
Tuesday = 729
Wednesday = 9312
Thursday = 8412
Friday = 6511
Saturday = 8614
Sunday = ?

2. You are at an unmarked intersection ... one way is the City of Lies and another way is the City of Truth.

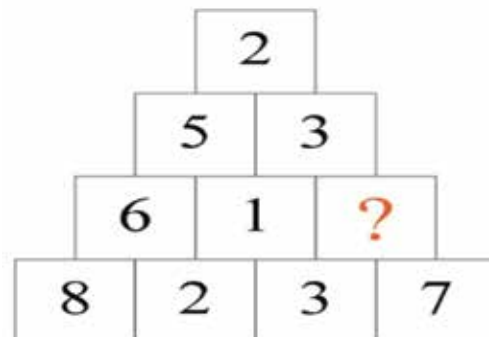   Citizens of the City of Lies always lie.
   Citizens of the City of Truth always tell the truth.

   A citizen of one of those cities (you don't know which) is at the intersection. What question could you ask to them to find the way to the City of Truth?

3. Fix given expression by moving only 1 Stick.

7. What is the missing number in the circle?

4. In a Medical Laboratory, you have 240 Injections, one of which is for Anesthesia for a rat. If Anesthesia injection is injected in a rat, it will faint in within 24 hours. You have 5 rats available to determine which one injection contains the Anesthesia. How do you achieve this in 48 hours ?

5. In a one day international cricket match, considering no extras(no wides, no 'no' balls, etc.) and no overthrows.
   What is the maximum number of runs that a batsman can score in an ideal case ?

   Note: "Here we assume ideal and little practical scenario. We assume that batsman can not run for more than 3 runs in a ball, as otherwise there is no limit, he can run infinite runs(theoretically) in a ball, as far as opposite team does not catch the ball."

- Miral Chauhan (6th Sem)

1) 6 || 2) "Tell me yout City's way" || 3) 0 + 4 = 4 || 5) 1653 || 6) 633 || 7) 4

the TECH -TREASURE

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