Problem Statements

1. "**Faculty Activity Insights: Streamlining Reporting and Analysis**"

Develop a user-friendly application to simplify the analysis and reporting of faculty activities. The solution should allow faculties to input their monthly activities easily, and generate clear, concise reports. The application should streamline data processing, providing valuable insights into faculty performance and contributions. The goal is to enhance transparency, efficiency, and data-driven decision-making within the academic institution.

2. "**Student Portfolio Hub: Streamlining Activity Management**"

Design a user-friendly platform that enables students to upload and organise their academic and extracurricular activities onto the university's data storage system. The solution should ensure straightforward data submission and categorization, enhancing accessibility and security of student portfolios. The aim is to create a centralised and easy-to-use system that allows students to showcase their achievements and experiences effectively.

3. "**Campus Voyager: Augmented Reality Navigation Experience**"

Develop an immersive AR/VR experience that provides a virtual tour of the university campus, including detailed indoor maps to guide users to classrooms, laboratories, and key facilities. The solution should offer an interactive and engaging exploration of the campus, allowing users to virtually navigate through buildings, view 360-degree surroundings, and access relevant information about different locations. The goal is to create an innovative AR/VR experience that enhances user familiarity with the university layout, aiding in effortless navigation and orientation within the campus environment.

4. "**Automated Lecture Enhancement with Supplementary Resources**"

Design a course tracking system for lectures where teachers can upload notes and references after each session. The system should automatically find additional online resources like open-source projects, books, and academic papers related to the lecture topic. The goal is to create a platform that enhances learning by offering diverse supplementary materials, aiding students in further exploration beyond classroom content.

5. "**Image-Based Crop Monitoring for Enhanced Agriculture**"

Develop an image processing solution for crop monitoring that analyses aerial or ground-level images to assess crop health, identify potential diseases, and track growth stages. The system should utilise image analysis techniques to provide real-time insights into crop conditions, enabling farmers to make informed decisions for optimised crop management and yield enhancement.

6. "**Swift Medical Aid: Drone Delivery in Remote Hill Areas**"

Create a drone delivery system tailored for efficiently transporting essential medicines to remote hilly regions. The system should utilise drone technology to facilitate swift and reliable delivery of medical supplies, overcoming geographical challenges and ensuring timely access to critical healthcare resources in inaccessible terrains.

7. "**Next-Gen Autonomy: Self-Driving Vehicle Algorithm with AI/ML & Computer Vision**"

Design an AI-powered self-driving vehicle system tailored for Indian roads, equipped to navigate amidst diverse traffic conditions and unexpected hurdles. The system should utilise AI/ML and Computer Vision to enable vehicles to autonomously travel, detect and respond to traffic variations, diverse obstacles, and unique road scenarios commonly found in Indian traffic, ensuring safe and efficient driving experiences.

8. "**Crime Hotspot Mapping & Behavioural Analysis Interface for Law Enforcement**"

Create an interface that bridges FIR (First Information Report) data, generating crime hotspots based on crime types. Implement colour mapping to depict varying crime intensities, considering parameters like date/time. Additionally, incorporate behavioural analysis to study criminal behavioural patterns, aiding law enforcement in crime prevention and strategizing crime intervention measures.

9. "**Efficient Incident Management Software for Prompt Emergency Response** "

Develop an integrated software solution encompassing major departments handling emergency situations like accidents or fires. The software should enable prompt incident reporting, automatically directing incident details to the respective concerned departments or district authorities. This streamlined system aims to enhance efficiency and response time, facilitating swift and coordinated action in emergency scenarios.

10. "**Child Identity Verification: Mobile App Linking Citizens to Missing Child Databases**"

Design a mobile application enabling citizens to verify if an unattended child matches any missing child from the "Track the Missing Child" database by utilising facial recognition or fingerprint software integrated with the Delhi Police system. The app should provide a user-friendly interface for individuals to capture and submit images or fingerprints, empowering citizens to assist in reuniting lost children with their families by leveraging available law enforcement resources.

11. "**Optimised Emergency Routing: Ambulance Navigation for Efficient Accident Response**"

Create a system that determines the shortest and fastest route for an ambulance to reach an accident site and subsequently navigate to the nearest hospital via roads with minimal traffic congestion. The system aims to optimise emergency response by leveraging real-time traffic data to guide ambulances swiftly and efficiently, ensuring timely medical assistance to accident victims.

12. “**Unified Health Card System: Harnessing Data for Public Health Analytics**”

Develop a comprehensive "Health Card" system to manage individuals' health histories, including diseases and allergies, akin to existing identity proofs like Aadhaar or PAN cards. This card will serve as a unified health profile accessible across hospitals, clinics, pharmacies, and laboratories, allowing seamless tracking of health-related data without any financial transactions. The aggregated health data will enable significant data analytics leveraging AI and machine learning, providing insights into city and area-specific disease prevalence, allergies, and other health patterns. This system aims to empower health authorities with timely information to proactively address health concerns, preventing widespread outbreaks and ensuring prompt action to safeguard public health.

13. “**Immersive Learning: AR/VR Integration for Complex Concepts**”

In today's digital age, visual engagement surpasses traditional learning methods. The integration of interactive and enjoyable elements significantly enhances student comprehension. Design an interactive learning solution leveraging AR/VR technology to teach complex concepts like projectile motion in an engaging and immersive manner.

Application Requirements:

- Implement AR/VR components within a web or mobile application.
- Ensure the inclusion of models that facilitate interactive learning experiences.·

14. “**Sustainify: Your Eco-Friendly Companion App**”

Encouraging sustainable habits remains a challenge for many individuals despite increased awareness. Adopting eco-friendly practices often proves challenging due to a lack of information and motivation. Create an app, Eco-Quest, that simplifies and promotes sustainability practices for users. The goal is to make sustainable living accessible and engaging by offering guidance, resources, and motivation.

Application Requirements:

- Tracking and Recording: Enable the app to track users' daily sustainability actions.
- Gamification Elements: Include challenges, rewards, and progress tracking for an engaging user experience.
- Sustainable Habits Resources: Offer information to facilitate the adoption of eco-friendly practices.
- User Accounts: Allow users to create accounts for progress tracking.
- User-Friendly Interface: Design an intuitive and easy-to-use interface.
- Notifications: Provide reminders to support users in making sustainable choices.
- Social Features: Implement sharing options for progress updates and community involvement.

15. “**Personalized Development Advisor: Strengthening Student Skills**”

In a university setting, students possess varying strengths and weaknesses shaped by diverse backgrounds. The objective is to support students' holistic development by offering recommendations to improve their identified weaknesses. The system utilises students' personal information, backgrounds, and identified skills to suggest methods for enhancement. Recommendations encompass communication, writing, technical skills, and presentation techniques. Additionally, the solution generates individual progress reports to track and evaluate student development over time.

16. “**Content Guard: Real-time Filtering and Reporting of Inappropriate Media**”

Develop a technological solution capable of detecting and blocking inappropriate media content (image, video, audio) directly at the user's end. The system should possess the ability to notify the relevant authorities promptly when such content is detected, preventing its further dissemination. The proposed solution can take the form of a desktop or mobile application or a web browser plugin.

17. “**Veri-Trace: Counteracting Fake News Spread with Official Sources**”

Create a technological solution or software tool to track and trace the origin of fake news, utilising official sources as the primary input filter. The solution aims to identify the sources of fake news and mitigate its impact by auto-populating the inboxes of fake news spreaders with official and authenticated news content.

18. “**Fake Social media account detection and reporting**”

The social life of everyone has become associated with online social networks. These sites have made a drastic change in the way we pursue our social life. Making friends and keeping in contact with them and their updates has become easier. But with their rapid growth, many problems like fake profiles, online impersonation have also grown. Fake profiles often spam legitimate users, posting inappropriate or illegal content. Several signs can help you spot a social media fake who might be trying to scam your business. Identifying fake social media profiles and taking corrective measures. Expected Output: An application software that detects the fake social media profile Users: Crime branch and other investigative agencies.

19. “**VirtuHouse: AR/VR Solution for Pre-Construction Visualization**”

Develop an AR/VR-based application that offers a virtual visualisation of entire houses in their early stages, aiding in cost estimation, project planning, and timely completion. This technology enables beneficiaries to access a virtual miniature of the completed house, providing cost estimates for pre-construction planning.

20. “**Human-Induced Change Detection: AI/ML Model for Satellite Imagery**”

Develop an automated system utilising satellite imagery to detect changes specifically caused by human activities. This project involves creating an AI/ML-based model tailored for detecting alterations in man-made objects such as vehicles, buildings, roads, and aircraft from remote sensing images. Utilise datasets like Sentinel-2 and LISS-4 for the development and testing of this change detection model.

21. “**Centralised Monitoring System for Street Light Fault Detection and Location Tracking**”

Electricity is crucial for livelihoods, but streetlight maintenance in Indian cities faces inefficiencies without a centralised monitoring system. This results in delayed fault identification, increased costs, and safety risks. Linemen spend significant time manually finding and fixing faults, leading to delays. We need an innovative solution for real-time fault detection, accurate identification, and precise location tracking of faulty streetlights. This solution aims to empower linemen, reduce workload, ensure timely maintenance, and enable proactive fault resolution by local authorities. The goal is to create an 'Automated Defect Detection and Prevention System for Indian Cities'.

22. “**FoodConnect: Optimising Food Redistribution for Communities in Need**”

Every day, significant quantities of food are discarded in urban areas due to approaching expiration dates. This wastage not only impacts the environment but also represents missed opportunities to nourish communities in need.

Solution Required: Develop a platform linking food suppliers (restaurants, grocery stores, catering services) with local food banks and non-profit organisations. The platform should utilise data analytics to optimise food rescue routes, minimise transportation expenses, and maximise benefits for underserved communities. Rather than discarding food nearing expiration or prepared but unconsumed, can we organise efforts to rescue these items for redistribution to those in need? Efficient logistics for collection and redistribution are crucial. The application should optimise timing and transport routes, ensuring minimal transport costs and preventing food spoilage while awaiting redistribution. Transport distances should also be limited to address these concerns.

23. “**A Qualitative and Quantitative Analysis of The Unemployment of Graduates**”

After graduating from higher educational institutions students are facing unemployment and usually go to various training institutes who promise them training and employment. One needs to take a deep dive into the matter, analyse why this phenomenon has taken so much momentum and find out the gaps in the system responsible for such an occurrence employing various qualitatively and quantitative methods.

24. “**Best Financial Management Practices to Reduce the Municipal Corporation’s Expense**”

The municipal corporations are the Urban Local Bodies which depend on its own income from property tax, professional tax etc. as well as Grants for the development projects from the state/union government. To provide better facilities to the citizens, it is desired to reduce the expenses and to manage the funds in such a manner that it can be used for other optimal purposes. This is the challenge for each municipal corporation to find the best ways or methods which can be useful for this matter.

25. “**Stray Cattle Monitoring**”

The issue of stray cattle roaming on the busy roads is very severe. This issue arises when cattle are either abandoned by their owners or left unattended due to various reasons such as ageing or other complications. These stray cattle pose a significant hazard to public safety, leading to traffic disruptions and potential accidents on the roads.

Expected Outcome:

Surat Municipal Corporation has CCTV cameras installed at various public places. Leveraging the video feeds from these cameras for real-time analysis, particularly in identifying stray cattle movements, can be an valuable asset. It is required to develop an innovative solution to analyse CCTV camera footage in real-time and identify instances of stray cattle movement. Further, the historical movement patterns of these cattle can further assist in strategically deploying resources for effective management.

26. “**SecureSign: Advanced Forgery Detection for Legal Document Images**”

In today's digital age, the authenticity and integrity of legal documents are paramount. However, with the increasing sophistication of forgery techniques, there's a pressing need for advanced methods to detect signature and stamp forgeries on legal document images. This hackathon challenge invites participants to develop innovative solutions that combine visual analysis, digital image processing, and machine learning to detect and prevent document forgery effectively.

Problem Statement:

Participants are required to design and implement a prototype system, named "SecureSign," that can automatically detect signature and stamp forgeries on digital images of legal documents.

Expected Deliverables:

A working prototype of the "SecureSign" system capable of detecting signature and stamp forgeries on digital legal document images.

27. **Smart Water Leakage Detection & Prevention**

Create an embedded system for smart water leakage detection and prevention in water supply networks, incorporating sensors to monitor water flow rates, pressure levels, and detecting anomalies indicative of leaks, and implementing automated shut-off valves and alert mechanisms to minimise water loss and facilitate timely repairs.

28. **TrafficTrax: Gamified Traffic Rules Compliance System**

Developing a gamified system for adhering to traffic rules and regulations where users earn points for following real-world traffic rules while facing deductions for rule violations. Upon accumulating a certain number of points, users receive coupons or vouchers. The system tracks users through traffic cameras, with each vehicle registered on a gaming app that records points and penalties. Additionally, the app aims to motivate users towards better traffic sense through various app sections and offers other traffic and transportation services.

29. **DeepGuard: Machine Learning Solutions for Deep-Fake Detection**

Develop machine learning-based algorithms capable of identifying and distinguishing deepfake content across videos, audio, or images. The challenge aims to create robust and efficient models that can detect subtle manipulations in media, specifically targeting deepfake technology. Participants are encouraged to explore innovative approaches, leveraging machine learning techniques to accurately discern authentic content from deepfake-generated media. Solutions should focus on enhancing detection accuracy, scalability, and adaptability to combat the proliferation of deceptive deepfake technology across digital platforms.

30. **StealthPlate: Anti-Tamper Vehicle Identification System**

In India, individuals often tamper with or conceal their vehicle's number plates to evade identification by traffic CCTV cameras for unlawful purposes. This hackathon challenge aims to develop an innovative system that doesn't rely on traditional number plates for vehicle identification. Participants are tasked with designing a device or technology to be installed in vehicles, ensuring tamper-proof and automatic identification without the need for visible number plates. Similar to toll tax systems, where tolls are automatically applied when vehicles pass through, this system should ensure reliable and unalterable vehicle identification to curb illegal activities involving modified or hidden number plates. Solutions should focus on accuracy, reliability, and ease of integration with existing traffic monitoring infrastructure.

31. **ITI Career Path Finder**

Develop a unique system that will help a 10th pass poor family student. Choose the appropriate carrier path as well as approachable ITI. Process is Such that it reduces the time duration between fillings of admission form to the starting of Training Session. Due to the long process of admission, it creates adverse effects on the entire system.

Expected Outcomes: Any eligible poor family students who are having low IQ and less logical thinking can also fill up the admission form without any mistake. Such that there will

be no correction required before/after generation of merit. 2 Automation of computer systems should be effectively done so that there will be less or negligible human/staff intervention in the admission process. Counselling programs should be arranged online by the ITI so that the students will easily be able to choose their interest area or trade which will become their career path in the long run.

32. **Automated Newsletter System**

Create a system that streamlines the process of sending newsletters by automating the entire procedure. This includes designing visually appealing newsletters that adapt seamlessly to different devices. The goal is to save time traditionally spent on manual tasks, eliminate the complexities of design, and ensure readers have an enjoyable and accessible experience across various devices.

33. **Library for Everyone**

Explore solutions to transform the library environment into a more user-friendly and beneficial space for individuals with disabilities. This involves identifying and implementing features, services, or technologies that cater to the unique needs of people with disabilities, ensuring an inclusive and welcoming library experience.

34. **RFID-Based Inventory Management**

Develop and integrate an RFID-based system aimed at optimising the process of cataloguing and tracking library items. This solution seeks to minimise the time and effort traditionally associated with inventory management, enhancing overall efficiency in library operations.

35. **Campus Energy Harvesting**

Create an innovative energy-harvesting system that generates power from renewable sources on campus, such as footstep energy, solar panels on walkways, or kinetic energy from revolving doors. This harvested energy can be stored and used to power low-energy devices and IoT sensors across the university, contributing to sustainability efforts and demonstrating cutting-edge technology in action.

36. **DMM Data Logger**

Make a clever system like a smart multimeter that can save electrical info to the cloud. This way, people can check their electrical stuff from far away. The big challenge is to make it measure tiny electrical currents really well, like microampere DC. The must-haves are making it simple to use on the cloud, secure and strong for sending data, and measuring lots of AC/DC voltages. Also, add cool stuff like checking if things are connected, testing diodes/transistors, and measuring humidity and temperature. Don't forget to put a timestamp on each thing saved. It can be used for testing electronics, watching machines in faraway places, learning about electronics, and checking the environment. We'll give prizes for the best ideas that work really well, are easy to use, and do cool things.