Problem Statements

Note: The names of the sponsoring companies are displayed alongside the problem statement titles. As greater emphasis has been placed on company sponsored problem statements, we kindly request you to prioritize and focus more on them.

TRACK I : Intelligent Systems

- **PS0101 : Intelligent Insurance Claim Processing with Straight-Through Processing (STP)**

  (*Sponsored by Persistent Systems)*

  Description :

  In the insurance industry, claim settlement is often a slow and inefficient process due to heavy reliance on manual validation, document verification, and multiple levels of approval. Even for simple, low-risk claims, human intervention is required at multiple stages, leading to unnecessary delays.

  This lack of automation results in longer turnaround times, higher operational costs, and poor customer satisfaction. Customers expect quick and seamless claim processing, but existing systems struggle to deliver real-time or near real-time settlements.

  At the same time, many claims are straightforward and repetitive in nature, making them ideal candidates for automation through intelligent systems. However, current solutions lack effective Straight-Through Processing (STP), where claims can be processed end-to-end without human involvement.

  Problem statement:

  Design and develop an intelligent claim processing system that enables automated evaluation and settlement of low-complexity insurance claims using Straight-Through Processing (STP), minimizing manual intervention while ensuring accuracy and fraud detection.

- **PS0102 : Intelligent Insurance Fraud Detection System**

  (*Sponsored by Persistent Systems)*

  Description:

  Insurance companies face significant financial losses due to fraudulent claims, waste, and abuse. Traditional fraud detection systems are largely rule-based and reactive, meaning they can only identify known fraud patterns after the damage is done.

  However, modern fraud is becoming increasingly sophisticated. Fraudsters often operate in coordinated groups, exploit system loopholes, and continuously evolve their tactics to bypass static detection rules. These complex and hidden patterns—such as repeated claims across different users, unusual behavioural trends, or collusion networks—are difficult to detect using conventional approaches.

  As a result, insurers struggle to proactively identify fraudulent activities, leading to increased claim leakage, reduced profitability, and compromised system integrity.

  Problem statement:

  Design and develop an intelligent fraud detection system that can proactively identify suspicious and potentially fraudulent insurance claims, including complex and evolving fraud patterns, using data-driven and adaptive techniques.

- **PS0103 : Automated Risk Assessment and Underwriting Platform**

  (*Sponsored by Persistent Systems)*

  Description:
  Insurance underwriting is a critical step in determining whether a policy should be issued and at what premium. However, current underwriting processes are often manual, slow, and dependent on fragmented data sources and subjective judgment by underwriters.

  This leads to delays in decision-making, inconsistencies in risk evaluation, and increased operational costs. Additionally, traditional underwriting models rely on limited and structured data (e.g., age, income, medical history), ignoring valuable alternative data sources such as behavioural patterns, telematics, or lifestyle indicators.

  As a result, insurers may inaccurately assess risk—either under-pricing high-risk customers or overpricing low-risk ones—leading to adverse selection and reduced competitiveness.

  With advancements in data analytics and AI, there is an opportunity to build intelligent systems that can automate underwriting decisions and leverage diverse data sources for more accurate and consistent risk assessment.

  Problem statement:

  Design and develop an intelligent underwriting system that can automate risk assessment and policy decision-making by leveraging both traditional and alternative data sources, reducing manual effort while improving accuracy and consistency.

- **PS0104 : Smart Crowd Management System for Pilgrimage Sites**

  (Not company sponsored)

  Description:

  Major pilgrimage destinations such as Somnath Temple, Dwarkadhish Temple, Ambaji Temple, and Pavagadh Temple experience extreme crowd congestion during festivals, weekends, and peak seasons.

  Current crowd management relies heavily on manual systems, leading to long physical queues, unpredictable waiting times, and traffic bottlenecks. This not only causes inconvenience but also creates safety risks such as overcrowding and stampedes. Vulnerable groups—including elderly individuals, children, and differently-abled devotees—are especially affected.

  There is a strong need for a digital system that can streamline the entire devotee journey, making it safer, more predictable, and less physically demanding.

  Problem statement:

  Design and develop a smart digital system that digitizes and optimizes crowd management at pilgrimage sites by enabling virtual queuing, real-time crowd monitoring, and intelligent routing, reducing physical congestion and improving the overall devotee experience.

- **PS0105 : AI-Based Customer Support Ticket Classification and Prioritization System**

  (Not company sponsored)

  Description:

  Customer support systems handle a high volume of tickets daily, ranging from minor queries to critical system failures. These tickets often vary in urgency, complexity, and business impact.

  In many organizations, ticket triaging is either manual or based on simple rule-based systems. This leads to issues such as incorrect classification, delayed responses to high-priority problems, and inefficient distribution of workload among support teams.

  As a result, critical issues may remain unresolved for longer periods, while less urgent tickets consume valuable time and resources. With the rise of AI and Natural Language Processing (NLP), there is an opportunity to automate ticket understanding and prioritization, enabling faster, smarter, and more efficient support systems.

  Problem statement:

  Design and develop an AI-driven system that automatically classifies, prioritizes, and routes customer support tickets based on their content and urgency, enabling faster resolution of critical issues and efficient workload distribution.

- **PS0106 : Intelligent Zero Trust Security System with Anomaly Detection**

  (Not company sponsored)

  Description:

  Modern systems face increasing risks from insider threats, which may originate from authorized users misusing access or from compromised accounts. Unlike external attacks, these threats are harder to detect because they often appear as normal user activity.

  Traditional security systems rely on static rules (e.g., login limits, access restrictions), which are not effective in identifying subtle behavioural anomalies such as unusual login times, abnormal access patterns, or deviations in user actions. These systems fail to adapt to evolving user behaviour, making them reactive rather than proactive.

  With advancements in AI and machine learning, it is now possible to model normal user behaviour and detect anomalies in real time. However, building such intelligent systems at scale can be complex, especially within limited development time.

  A lightweight, adaptive prototype can demonstrate how behavioural analysis can significantly improve threat detection without relying on rigid rules.

  Problem statement:

  Design and develop an AI-powered system that detects insider threats by identifying anomalies in user behaviour, assigns a dynamic risk score, and triggers alerts or preventive actions to enable proactive security.

TRACK II : Cybersecurity and Smart Urbanization

- **PS0201 : AI-Based Deepfake Detection System for Media Authentication**

  (*Sponsored by Vulnuris)*

  Description:

  Advancements in generative AI have enabled the creation of highly realistic synthetic media, including images, videos, and audio. While these technologies have beneficial applications, they also pose serious risks such as misinformation, fraud, identity theft, and manipulation of public opinion.

  Detecting such AI-generated content has become increasingly challenging, as traditional verification methods struggle to keep up with the sophistication of modern deepfake techniques. Subtle artifacts, inconsistencies, or anomalies in media are often difficult for humans to identify.

  There is a growing need for intelligent systems that can analyse media content and determine its authenticity, helping individuals and organizations maintain digital trust. A lightweight, focused prototype can demonstrate how AI can be leveraged to identify potential deepfakes effectively.

  Problem statement:

  Design and develop an AI-powered system that detects whether a given media input (image, audio, or video) is real or AI-generated and provides an authenticity decision along with a confidence score and basic explanation.

- **PS0202 : AI-Powered SOC Alert Classification and Prioritization System**

  (*Sponsored by Vidhit Technologies)*

  Description:

  Modern Security Information and Event Management (SIEM) systems generate an overwhelming number of alerts from logs and monitoring tools. A large portion of these alerts are false positives or low-priority events, which leads to alert fatigue among Security Operations Centre (SOC) analysts.

  As a result, L1 analysts spend significant time manually reviewing, classifying, and documenting repetitive alerts instead of focusing on genuine security threats. This increases the risk of missing critical incidents and delays response times.

  There is a need for an intelligent system that can automatically analyse alerts, filter out noise, prioritize real threats, and assist in documentation—reducing manual workload and improving overall security efficiency.

Problem statement:

Design and develop an AI-powered SOC assistant that automatically classifies, prioritizes, and summarizes SIEM alerts, helping analysts quickly identify critical threats while reducing alert fatigue and manual effort.

- **PS0203 : LLM Security Middleware for Safe AI Interactions**

  (Not company sponsored)

  Description:

  Large Language Models (LLMs) are rapidly being integrated into applications such as chatbots, assistants, and automated workflows. However, their open-ended nature introduces serious security risks, including prompt injection, data leakage, and misuse for phishing or social engineering.

  Attackers can craft malicious inputs—such as jailbreak prompts or obfuscated instructions—to manipulate the model into bypassing safeguards or revealing sensitive information. Traditional rule-based filters are often insufficient to handle these evolving threats.

  There is a growing need for an intelligent protection layer that can monitor and control interactions with LLMs in real time. A lightweight middleware solution can act as a security gateway, ensuring safe and reliable usage without significantly increasing latency.

  Problem statement:

  Design and develop a lightweight middleware system that intercepts, analyses, and secures interactions between users and an LLM, detecting and preventing unsafe inputs and outputs such as prompt injections, phishing content, or sensitive data leakage.

- **PS0204 : Smart Civic Issue Reporting and Management System**

  (Not company sponsored)

  Description:

  Urban and semi-urban areas frequently face civic issues such as garbage accumulation, water leakage, potholes, and streetlight failures. However, existing reporting systems are often fragmented, slow, and lack proper tracking and transparency.

  Citizens struggle to report issues effectively due to missing features like location tagging and evidence upload, while authorities face challenges in verifying, prioritizing, and assigning complaints across departments. As a result, critical issues are often delayed, and there is limited visibility into resolution progress.

  There is a need for a simple, centralized platform that enables efficient issue reporting, intelligent prioritization, and transparent tracking—improving coordination between citizens and authorities

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Problem statement:

Design and develop a smart system that allows citizens to report civic issues with location and evidence, automatically classifies and prioritizes them, and enables authorities to track and manage their resolution efficiently.

- **PS0205 : Smart Waste Management System with Real-Time Bin Monitoring**

  (Not company sponsored)

  Description:

  Urban areas struggle with inefficient waste collection due to lack of real-time monitoring of dustbin fill levels. Fixed collection schedules often result in unnecessary pickups of half-filled bins, while some bins overflow before being serviced—leading to unhygienic conditions, foul Odors, and environmental concerns.

  This inefficiency increases operational costs, fuel usage, and workload for municipal services, while reducing the overall cleanliness of the city.

  A smart, data-driven system can help monitor bin status in real time and optimize collection efforts—ensuring timely pickups and better resource utilization.

  Problem statement:

  Design and develop a smart waste management system that monitors dustbin fill levels, provides real-time status updates, and assists in optimizing collection decisions to prevent overflow and improve efficiency.

- **PS0206 : Smart Street Lighting System with Adaptive Control and Monitoring**

  (Not company sponsored)

  Description:

  Urban street lighting is essential for safety, visibility, and efficient city operations. However, most systems operate on fixed schedules without real-time monitoring, leading to unnecessary energy consumption, delayed fault detection, and poorly lit areas.

  Additionally, street lighting systems do not adapt to real-world conditions such as pedestrian movement or traffic density. This results in inefficient resource utilization and reduced public safety, especially during low-visibility or high-activity periods.

  There is a need for a smart, connected system that can dynamically control streetlights based on environmental conditions and activity, while providing real-time monitoring and insights for better urban management.

Problem statement:

Design and develop a smart system that dynamically monitors and controls streetlights based on ambient conditions and activity levels, while providing real-time visibility, fault detection, and basic analytics to improve energy efficiency and urban safety.

TRACK III : Blockchain

- **PS0301 : Community-Based Peer-to-Peer Lending Management System**

  (Sponsored by Algorand)

  Description:

  In many small communities and informal groups, people rely on peer-to-peer lending for quick financial support. However, these transactions are often managed through chats, spreadsheets, or verbal agreements, making it difficult to track loan requests, contributions, repayments, and outstanding balances.

  This lack of transparency can lead to confusion, missed payments, and reduced trust among participants. There is a need for a simple, centralized system that allows users to manage community-based lending in a clear and structured way.

  A lightweight digital platform can improve visibility, accountability, and ease of use—ensuring that all participants have a clear understanding of loan status and repayment progress.

  Problem statement:

  Design and develop a digital platform that enables community-based peer-to-peer lending, allowing users to post loan requests, fund loans, track repayments, and monitor loan status transparently until closure.

- **PS0302 : DAO-Based Treasury Management and Voting System**

  (Sponsored by Algorand)

  Description:

  Small communities, clubs, and decentralized groups often manage shared funds for events, initiatives, or operational expenses. However, decision-making around fund usage is frequently informal, lacking transparency, accountability, and structured governance.

  Decentralized Autonomous Organizations (DAOs) introduce a model where decisions are made collectively through proposals and voting. However, implementing a full-scale DAO system can be complex and resource-intensive.

  There is a need for a simplified, transparent treasury system that allows members to propose fund usage, vote on decisions, and ensure that funds are released only when predefined approval conditions are met.

  Problem statement:

  Design and develop a DAO-based treasury system that enables users to create proposals, vote on them, and securely execute fund transfers only after meeting defined approval and quorum conditions.

- **PS0303 : Decentralized Bounty Escrow and Settlement System**

  (Sponsored by Algorand)

  Description:

  Open bounty platforms enable sponsors to outsource tasks to a wider community, but they often suffer from trust issues. Contributors are unsure whether they will be paid after completing the work, while sponsors worry about receiving low-quality or incomplete submissions.

  This lack of trust leads to disputes, reduced participation, and inefficiencies in task completion. Traditional systems either rely heavily on manual moderation or lack transparency in how decisions are made.

  A structured escrow-based system can solve this by locking funds upfront, tracking submissions, and enforcing predefined rules for validation and payout—ensuring fairness and accountability for both sponsors and contributors.

  Problem statement:

  Design and develop a bounty escrow system that enables sponsors to post tasks with locked funds, allows contributors to submit work, and ensures transparent validation and settlement through payout or refund based on predefined conditions.

- **PS0304 : Invoice Tracking and Collection Management System**

  (Sponsored by Algorand)

  Description:

  Small businesses often face challenges in managing invoice collections due to delayed payments, inconsistent follow-ups, and lack of visibility into outstanding receivables. Many still rely on manual tracking through spreadsheets or messaging, which leads to missed payments and poor financial planning.

  Without a structured system, it becomes difficult to track partial payments, identify overdue invoices, and understand overall collection performance. This lack of transparency can affect cash flow and business sustainability.

  A simple, real-time digital solution can help businesses efficiently track invoices, monitor repayments, and gain insights into their collection health.

  Problem statement:

  Design and develop an invoice collection system that tracks invoices, manages full and partial repayments, updates outstanding balances in real time, and provides a dashboard for monitoring collection status and overdue payments.

- **PS0305 : Escrow-Based Secure Checkout and Transaction System**

  (sponsored by Algorand)

  Description:

  In digital marketplaces, transactions between buyers and sellers often suffer from trust issues. Buyer's fear paying upfront without receiving the promised product or service, while sellers worry about delivering without guaranteed payment.

  Traditional systems rely on intermediaries or manual dispute resolution, which can be slow, opaque, and inefficient. This creates friction in peer-to-peer commerce and limits participation in decentralized or trust-minimized environments.

  An escrow-based system can solve this by temporarily locking funds until predefined conditions—such as delivery confirmation—are met. By enforcing structured state transitions, such a system ensures fairness, transparency, and security for both parties.

  Problem statement:

  Design and develop an escrow-based checkout system that locks funds during a transaction, tracks delivery status, and automatically releases or refunds funds based on predefined conditions, ensuring a secure and trust-minimized exchange between buyer and seller.

- **PS0306 : Pay-Per-Use AI API Access System with Secure Payment Verification**

  (Sponsored by Algorand)

  Description:

  As AI-powered tools and prompts become more valuable, creators are looking for ways to monetize their work without relying on subscriptions or platform lock-ins. However, current systems lack simple mechanisms to charge users on a per-use basis.

  There is a need for a system that allows creators to expose premium AI functionality through secure endpoints, where users must complete a payment before accessing the service. Such a system should handle authentication, payment verification, and controlled access seamlessly.

  A lightweight prototype can demonstrate how pay-per-use AI services can be enabled using secure APIs and automated verification flows.

  Problem statement:

  Design and develop a secure API system that enables pay-per-use access to premium AI prompts or services, where users must complete a payment before receiving a response from the model.

TRACK IV :Future Learning (EduTech & Healthcare)

- **PS0401 : ERP Portal**

  (Sponsored by Shivam Engineers)

  Description:

  Electrical distribution companies operating across multiple branches and warehouses (godowns) face challenges in managing inventory, orders, and financial workflows in a centralized and transparent manner. Stock is often distributed across locations with varying policies, and manual coordination leads to inefficiencies such as stock mismatches, delayed approvals, and poor visibility into operations.

  Additionally, tracking inter-branch transfers, managing client credit, and monitoring sales performance becomes complex without a unified system. Existing ERP solutions may be expensive or overly complex, making it difficult for mid-sized businesses to adopt them effectively.

  There is a need for a simplified, centralized system that digitizes core operations, provides real-time visibility, and standardizes workflows across branches—while remaining scalable and easy to use.

  Problem statement:

  Design and develop a centralized ERP-like system that manages multi-branch inventory, order workflows, and basic financial tracking, providing real-time visibility and role-based access to streamline operations and improve decision-making.

- **PS0402 : AI-Powered Personalized Learning Pathways**

  (Sponsored by RV TECHLEARN)

  Description:

  In today's education systems, most learning platforms deliver uniform content without adapting to individual student needs. This often leads to disengagement, ineffective learning, and difficulty in identifying weak areas early.

  With limited time and resources, there is a need for a lightweight, intelligent prototype that can demonstrate how personalized learning can be achieved using basic analytics and simple AI techniques. By analyzing student interactions such as quiz performance and accuracy, the system can adapt content difficulty, highlight weak areas, and provide targeted recommendations.

  A simplified solution can showcase how real-time insights and adaptive learning paths improve engagement and learning outcomes within a practical hackathon scope.

Problem Statement :

Design and develop a lightweight AI-driven adaptive learning system that personalizes the learning experience by analyzing quiz performance and basic user interactions.

The system should dynamically adjust question difficulty, identify weak areas, recommend relevant learning resources, and provide simple performance insights through dashboards for students and educators.

- ## PS0403 : Intelligent Academic Burnout & Mental Wellness Detection

(Sponsored by RV TECHLEARN)

Description:

Students today often face high academic pressure, which can lead to stress and burnout. However, early signs of burnout—such as reduced study activity, low engagement, and negative mood patterns—often go unnoticed due to the lack of simple monitoring tools.

Within a limited hackathon timeframe, a lightweight prototype can demonstrate how basic behavioral data (e.g., study time, quiz activity, and mood inputs) can be used to identify early warning signs of burnout. By combining simple analytics with rule-based or basic AI logic, the system can generate a burnout risk score, visualize trends, and suggest basic interventions.

Such a solution can help showcase how technology can support student well-being through early detection and actionable insights.

Problem Statement:

Design and develop a lightweight AI-enabled system that tracks basic student activity and mood inputs to identify early signs of academic burnout.

The system should analyze simple behavioral patterns (such as activity levels and mood trends), compute a basic burnout risk score, and present insights through a user-friendly dashboard. It should also provide simple alerts and suggestions to encourage timely intervention and improved student well-being.

- ## PS0404 : AI-Based Symptom Assessment and Triage System

  (Sponsored by RV TECHLEARN)

  Description:

  Many individuals lack access to quick and reliable medical guidance, leading to confusion, anxiety, or delayed action when experiencing symptoms. People often rely on random online searches, which may not provide accurate or context-aware insights.

  Within a hackathon scope, a lightweight AI-assisted prototype can demonstrate how basic symptom inputs can be analyzed to provide general risk awareness (not diagnosis). Using simple rule-based logic or basic models, the system can classify symptoms into urgency levels and provide safe, explainable guidance.

  The focus is on building a responsible and user-friendly system that promotes awareness, tracks symptom history, and offers clear, non-diagnostic insights to support better decision-making.

  Problem statement:

  Design and develop a lightweight AI-assisted symptom assessment system that allows users to input symptoms and receive a basic risk classification (Low/Medium/High) along with simple, explainable guidance.

  The system should track symptom history, display trends through a dashboard, and ensure all outputs are non-diagnostic, transparent, and easy to understand, making it suitable for quick health awareness within a limited development timeframe.

- ## PS0405 : AI-Powered Medical Report Simplification & Insights Dashboard

  (Sponsored by RV TECHLEARN)

  Description:

  Medical reports often contain complex medical terminology, abbreviations, and numerical values that are difficult for patients to understand. As a result, patients may misinterpret their health status, overlook critical indicators, or depend entirely on doctors for basic explanations.

  Additionally, reports lack intuitive visualization, making it hard to identify abnormal values or track health trends over time. This gap in understanding can lead to poor health decisions and delayed action.

  There is a need for a simple, intelligent system that can extract key information from medical reports and present it in a clear, user-friendly format with actionable insights.

Problem statement:

Design and develop an AI-powered system that extracts key parameters from medical reports and converts them into simple, easy-to-understand explanations, while providing a visual dashboard to highlight abnormal values, basic trends, and potential health risks.

- ## PS0406 : Smart Medicine Adherence System with Predictive Analytics

(Sponsored by RV TECHLEARN)

Description:

Medication non-adherence is a major healthcare challenge, especially for patients with chronic conditions. Many patients forget to take their medicines on time, skip doses, or stop medication prematurely, leading to poor health outcomes and increased healthcare costs.

Existing reminder systems are often basic and do not provide insights into user behavior or identify patterns of missed doses. There is a need for a smarter system that not only reminds patients but also tracks adherence and predicts potential non-compliance.

A lightweight, intelligent solution can help patients stay consistent with their medication while providing caregivers with visibility into adherence patterns.

Problem statement:

Design and develop a smart system that reminds users to take medications, tracks adherence behavior, and provides basic predictive insights to identify potential missed doses, along with simple dashboards for patients and caregivers to monitor adherence trends.