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IBM Skills Build for Academia

Problem Statements on Agentic AI

Problem Statement No.1 - **Research Agent**

The Challenge- A **Research Agent** is an AI system designed to assist with academic and scientific research tasks. It can autonomously search for literature, summarize papers, and organize references.
Using natural language processing, it understands research questions and retrieves relevant information.
The agent can generate reports, suggest hypotheses, and even draft sections of research papers.
It saves time by automating repetitive tasks like citation management and data extraction.
Research Agents enhance efficiency, accuracy, and innovation in both academic and industrial R&D.

Technology - Use of IBM cloud lite services /IBM Granite is mandatory.

Problem Statement No.2 - An AI agent designed to assist faculty with NBA accreditation processes (RAG Based)

The Challenge - An **AI agent** designed to assist faculty with **NBA accreditation processes** using **RAG (Retrieval-Augmented Generation)**.
It retrieves relevant NBA criteria, formats, and past documentation from internal and external sources.
Faculty can query the agent for guidance on SAR preparation, CO-PO mapping, and documentation.
The RAG model ensures up-to-date and context-aware responses, grounded in trusted data.
It reduces manual effort, ensures consistency, and speeds up accreditation readiness.
This intelligent assistant supports continuous improvement and compliance with NBA standards.

Technology - Use of IBM cloud lite services /IBM Granite is mandatory.

Problem Statement No.3 - An AI agent designed to assist faculty with NACC accreditation processes (RAG Based)

The Challenge - An **AI agent** designed to assist faculty with **NAAC accreditation processes**, powered by **RAG (Retrieval-Augmented Generation)**.
It retrieves institutional data, past reports, and NAAC guidelines to provide precise, context-aware support.
Faculty can interact with the agent to generate SSR drafts, criteria-wise inputs, and best practice documentation.
The RAG approach ensures answers are grounded in trusted sources and tailored to the institution's context.
It streamlines documentation, enhances accuracy, and reduces time spent on repetitive tasks.
This AI assistant empowers faculty to focus on quality improvement while ensuring NAAC compliance.

Technology - Use of IBM cloud lite services /IBM Granite is mandatory.

Problem Statement No.4 - College Admission Agent (RAG Based)

The Challenge - A **College Admission Agent**, powered by **RAG (Retrieval-Augmented Generation)**, streamlines the student admission process.
It retrieves and summarizes admission policies, eligibility criteria, and FAQs from institutional databases and official sources.
Prospective students can ask natural language questions and receive accurate, up-to-date responses instantly.
The agent helps with course selection, application guidance, fee structure, and important deadlines.
Using trusted, real-time data, it reduces manual inquiries and enhances applicant experience.
This AI-driven assistant boosts transparency, accessibility, and efficiency in college admissions.

Technology - Use of IBM cloud lite services /IBM Granite is mandatory.

Problem Statement No.5- Travel Planner Agent

The Challenge - A **Travel Planner Agent** is an AI-powered assistant that helps users plan trips efficiently and intelligently.
It uses real-time data to suggest destinations, build itineraries, and recommend transport and accommodation options.
By understanding user preferences, budgets, and constraints, it tailors personalized travel plans.
Integrated with maps, weather updates, and local guides, it ensures a smooth travel experience.
The agent can also manage bookings, alert users to changes, and optimize schedules on the go.
This smart assistant transforms complex travel planning into a seamless, enjoyable process.

Technology - Use of IBM cloud lite services /IBM Granite is mandatory.

Problem Statement No.6 – Eco Lifestyle Agent

The Challenge – An Eco Lifestyle Agent, powered by RAG (Retrieval-Augmented Generation), empowers users to adopt a greener lifestyle through personalized, practical suggestions.
It retrieves sustainable living tips, eco-friendly product recommendations, local recycling guidelines, and government schemes from trusted environmental sources.
Users can ask natural language questions such as “How can I reduce plastic use at home?” or “What are eco-friendly travel options in my city?” and receive instant, actionable guidance.
The agent promotes small daily actions with big environmental impact, making sustainability easy and accessible.
This AI-driven assistant fosters eco-conscious decisions, raises awareness, and helps build a more sustainable future.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Problem Statement No.7 – AI Agent for Digital Financial Literacy

The Challenge – An AI Agent for Digital Financial Literacy, powered by RAG (Retrieval-Augmented Generation), helps users understand and navigate essential financial tools and practices.
It retrieves reliable content on using UPI, avoiding online scams, understanding interest rates, budgeting, and personal finance management from government portals, banking websites, and educational platforms.
With multilingual support, users from diverse backgrounds can interact in their preferred language and ask questions like "How do I send money via UPI?" or "What is a safe interest rate for a loan?"
The agent ensures financial literacy is accessible, personalized, and culturally inclusive.
This AI-driven assistant empowers users with knowledge, protects them from fraud, and builds confidence in digital finance.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Problem Statement No.8- Nutrition Agent

The Challenge - In an era where health awareness is growing, individuals increasingly seek personalized nutrition guidance. However, most existing tools provide generic diet plans, lack real-time adaptability, and fail to consider a person's holistic lifestyle, cultural preferences, allergies, and evolving health conditions. Furthermore, dieticians and nutritionists face limitations in scaling personalized consultations due to time and resource constraints.
Generative AI presents a groundbreaking opportunity to revolutionize this space by enabling an intelligent, interactive, and adaptive virtual nutrition assistant. By leveraging natural language processing (NLP), multimodal understanding, and large-scale dietary databases, an AI-powered assistant can generate dynamic meal plans, recommend smart food swaps, and explain nutritional choices—all tailored to the individual.
This project aims to develop **"The Smartest AI Nutrition Assistant"** using state-of-the-art generative AI models that:

- Understand user inputs via text, voice, or image (e.g., food photos, grocery labels)
- Generate personalized meal plans based on health goals, medical conditions, fitness routines, and preferences
- Offer contextual explanations (e.g., "Why is this food better?")
- Adapt suggestions dynamically with continuous feedback

By integrating health data, food databases, and LLM-powered reasoning, the solution will bridge the gap between one-size-fits-all diet apps and in-person nutrition counselling—delivering an AI that thinks, learns, and cares like a real nutrition expert.

Technology - Use of IBM cloud lite services /IBM Granity is mandatory.

Problem Statement No.9 – AI Agent for Smart Farming Advice

The Challenge – An AI Agent for Smart Farming Advice, powered by RAG (Retrieval-Augmented Generation), supports small-scale farmers by delivering real-time, localized agricultural guidance.
It retrieves trusted data on weather forecasts, soil conditions, crop recommendations, pest control measures, and current market prices from agricultural departments, meteorological sources, and agri-tech platforms.
Farmers can interact in their local language and ask questions like "What crop is best for this season?" or "What is today's mandi rate for tomatoes?"
The agent ensures timely, data-driven decisions that reduce risk, increase yield, and boost income.
This AI-driven assistant bridges the knowledge gap and brings smart farming to the grassroots.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Problem Statement No.10 – AI-Driven Plagiarism Intelligence for Assignments

The Challenge – Academic institutions face increasing difficulty in detecting nuanced forms of plagiarism, especially when assignments are paraphrased or generated by AI tools. Current plagiarism detectors lack contextual sensitivity to instructor-specific styles and grading patterns. The challenge lies in creating an adaptive AI system that learns from historical assignment submissions and instructor feedback to identify inconsistencies and potential misconduct dynamically. This would enhance academic integrity by flagging suspicious entries with improved accuracy and contextual awareness.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Problem Statement No.11 – AI Lab Manual & Experiment Generator

The Challenge – An AI Lab Manual & Experiment Generator, powered by RAG (Retrieval-Augmented Generation), assists educators and students by generating step-by-step lab manuals, virtual experiment simulations, and evaluation rubrics tailored to their syllabus and available equipment.
It retrieves relevant curriculum data, lab protocols, and assessment guidelines from academic databases and institutional repositories.
Users can input their course code or syllabus topics and receive ready-to-use manuals, safety instructions, and grading criteria.
The agent ensures consistency, accuracy, and alignment with educational standards, reducing the

manual effort of lab preparation.
This AI-driven assistant enhances hands-on learning, supports remote labs, and modernizes STEM education delivery.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Problem Statement No.12 - Agentic AI for Personalized Course Pathways.

The Challenge - Students often struggle to identify the right learning path that aligns with their interests and long-term goals due to the overwhelming number of online courses and a lack of personalized guidance. LearnMate aims to solve this by acting as an Agentic AI coach that interacts with students, understands their interests (like Frontend Development, Cybersecurity, UI/UX Design, etc.), assesses their current skill level, and dynamically builds a personalized course roadmap that adapts over time based on progress and preferences.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Problem Statement No.13 - Fitness Buddy

The challenge - In today's fast-paced world, many individuals struggle to maintain a healthy lifestyle due to lack of personalized guidance, time constraints, and inconsistent motivation. Traditional fitness solutions often require expensive subscriptions, in-person consultations, or rigid schedules that don't adapt to personal preferences or daily routines.

There is a growing need for an accessible, friendly, and intelligent virtual assistant that can provide on-demand fitness advice, healthy lifestyle suggestions, and basic nutrition guidance—all tailored to individual needs and available at any time.

Fitness Buddy aims to solve this problem by offering a conversational, AI-powered health and fitness coach that can:

Recommend home workouts and routines based on user input.

- Provide motivational tips and daily fitness inspiration.
- Suggest simple, nutritious meal ideas.
- Encourage habit-building and consistency.

Technology: Use of IBM cloud lite services /IBM Granity is mandatory.

Problem Statement No.14– Syllabus and Curriculum Design Optimizer

The Challenge – A Syllabus and Curriculum Design Optimizer is an AI system designed to assist faculty in developing and refining academic course content. It can autonomously analyze existing syllabi, recommend improvements, and align topics with learning outcomes and accreditation standards.

Using natural language processing, it understands curriculum goals and suggests relevant topics, assessments, and resources.

The agent can generate draft syllabi, update course structures, and recommend instructional strategies based on the latest academic and industry trends.

It saves time by automating repetitive tasks like mapping outcomes, updating reading lists, and formatting documents.

Syllabus Optimizers enhance quality, consistency, and innovation in curriculum development across academic programs.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Problem Statement No. 15– Agentic Career Counseling Companion

The Challenge – Students often struggle to make informed career decisions due to fragmented access to guidance, limited self-awareness of academic strengths, and rapidly evolving industry landscapes. Traditional counseling methods lack personalization and scalability, leading to missed opportunities and career mismatches. The challenge is to develop an intelligent, autonomous agent that continuously monitors student performance, evolving interests, and real-time labor market trends to deliver tailored career pathway suggestions. This would empower students to make confident, future-ready decisions with minimal dependency on manual intervention.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Problem Statement No. 16- Recipe Preparation Agent

The Challenge - A **Recipe Preparation Agent** helps users cook meals using only the ingredients they have on hand.
By inputting available groceries, users receive tailored recipe suggestions using a **RAG-based AI system**.
The agent retrieves relevant recipes and generates step-by-step instructions adapted to ingredient limitations.
It offers substitutions, cooking tips, and dietary adjustments based on user preferences or restrictions.
Designed to reduce food waste and save time, it turns pantry items into practical meal solutions.
This AI assistant makes everyday cooking smarter, simpler, and more sustainable.

Technology - Use of IBM cloud lite services /IBM Granity is mandatory.

Problem Statement No.17 – Multi-language Course Content Translator Agent

The Challenge – A Multi-language Course Content Translator Agent, powered by RAG (Retrieval-Augmented Generation), enables automatic translation of academic course materials into multiple regional languages while preserving technical accuracy and educational context.
It retrieves academic glossaries, curriculum frameworks, and subject-specific terminologies to ensure translations are context-aware and pedagogically sound.
Users can upload notes, presentations, or PDFs and receive translations that maintain the integrity of the original content across languages like Hindi, Marathi, Tamil, Bengali, and more.
The agent promotes inclusive education, removes language barriers, and supports students from diverse linguistic backgrounds.
This AI-driven assistant enhances accessibility and equity in learning environments.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Problem Statement No :- 18 AI Grant And Funding Finder For Startups

The Challenge : Developing an AI-based Grant and Funding Finder for startups poses several challenges. Funding opportunities are spread across multiple platforms, each with different formats, languages, and update frequencies, making data collection and real-time aggregation complex. Extracting relevant details like eligibility, deadlines, and submission requirements from unstructured content demands robust natural language processing. Personalizing results based on a startup's stage, domain, and location adds another layer of complexity. Moreover, automatically generating tailored proposals or application drafts must strike a balance between accuracy and creativity, often requiring human validation. Finally, ensuring the agent respects legal boundaries and submission rules—especially for confidential or restricted portals—remains critical.

Technology - Use of IBM Cloud Lite services / IBM Granite is mandatory

Problem Statement No.19 – Course Content Simplification Agent

The Challenge – Educational materials often vary in complexity and are not always accessible to learners with different levels of prior knowledge. Students may struggle to grasp key concepts due to jargon-heavy or overly advanced explanations in faculty notes and textbooks. The challenge is to develop an AI-powered agent that can intelligently analyze academic content and reframe explanations based on the

learner's current proficiency—ranging from beginner to expert. This would support more inclusive learning and personalized education delivery at scale.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Problem Statement No.20 – Startup Blueprint Generator Agent

The Challenge – A Startup Blueprint Generator Agent, powered by RAG (Retrieval-Augmented Generation), transforms raw startup ideas into complete, actionable business blueprints.
It retrieves relevant data on market research, funding options, competitor analysis, revenue models, government schemes, and legal requirements from startup portals, incubator databases, and policy documents.
Users can describe their idea in simple terms, and the agent provides a structured plan including business model canvas, estimated budget, go-to-market strategy, and potential investor connections.
The agent eliminates ambiguity and accelerates the journey from idea to implementation.
This AI-driven assistant empowers aspiring entrepreneurs with clarity, resources, and direction to launch their ventures successfully.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Problem Statement No.21 – Library AI Agent

The Challenge – A Library AI Agent is an intelligent system designed to assist students in finding the right learning materials based on their academic needs. It can autonomously analyze user profiles, study topics, and course syllabi to suggest relevant books and resources.

Using natural language processing, it understands student queries and matches them with the most suitable books in the library database.

The agent can check real-time book availability, prioritize high-demand titles, and assist with reservation or waitlist actions.

It saves time by streamlining the search process and offering personalized recommendations aligned with current academic work.

Library AI Agents enhance access, engagement, and resource utilization in educational environments.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Problem Statement No.22 – Interview Trainer Agent

The Challenge – An Interview Trainer Agent, powered by RAG (Retrieval-Augmented Generation), prepares users for job interviews by generating tailored question sets and preparation strategies based on their profile name, experience level, and job role.
It retrieves role-specific interview questions, industry expectations, behavioral scenarios, and HR guidelines from recruitment portals, professional networks, and company interview databases.
Users can input their resume or job title, and the agent provides targeted questions, model answers, and improvement tips.
It supports both technical and soft skill assessment, ensuring a comprehensive interview prep experience.
This AI-driven assistant builds user confidence, sharpens responses, and increases success rates in competitive hiring environments.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Problem Statement No.23 - AI Career Counselor Rural Youth

Challenge – Youth in rural areas often lack access to structured career guidance due to limited exposure, absence of professional counselors, and poor awareness of skill development opportunities. Many students are unaware of job-oriented courses, government schemes, or online training platforms that could help them build a career aligned with their interests.

Traditional methods of career counseling are not scalable and fail to reach underserved communities, contributing to skill mismatch, underemployment, and loss of potential.

There is a strong need for a smart, localized, and accessible solution that can provide personalized career guidance to rural youth based on real-time, trusted information.

Technology - Use of IBM cloud lite services /IBM Granite is mandatory.

Problem Statement No.24 - Course Content Simplification Agent

Challenge - Many students, especially first-generation learners and those from non-English-medium backgrounds, struggle to understand complex academic course material. Textbooks, research papers, and lecture notes often use technical jargon or dense explanations, making it difficult for students to grasp core concepts independently.

This comprehension gap leads to lower academic performance, reduced confidence, and a growing divide in learning outcomes — particularly in under-resourced or rural educational institutions.

There is a pressing need for a solution that can automatically simplify educational content into clear, digestible formats suitable for a diverse student population.

Technology - Use of IBM cloud lite services /IBM Granite is mandatory.

Problem Statement No.25 - AI Job Mentor for Informal Workers

Challenge – Millions of informal workers such as daily wage laborers, artisans, gig workers, and self-employed individuals face difficulty in accessing job opportunities, skill development programs, and financial resources. Most of them are unaware of government schemes, training courses, or nearby job openings that could improve their income and career prospects.

The lack of digital literacy, guidance, and personalized information further widens the opportunity gap — especially in semi-urban and rural communities.

There is a strong need for a personalized, always-accessible, and vernacular-language job mentorship platform that empowers informal workers to find better jobs and build sustainable livelihoods.

Technology - Use of IBM cloud lite services /IBM Granite is mandatory.

Problem Statement No.26 - AI-Powered LaTeX Diagram Generator for Academic Research

An intelligent agent that automatically converts natural language descriptions and sketches into professional TikZ code for LaTeX documents. It provides real-time feedback, accepts plain-English refinement commands, and delivers publication-ready diagrams while eliminating manual coding complexity for researchers.

Technology – IBM Watson Studio, IBM Granite Models

Problem Statement No.27- AI agent for chronic disease monitoring

The Challenge - An **AI agent for chronic disease monitoring** helps patients and healthcare providers manage long-term conditions effectively.
It continuously analyzes health data from wearables, medical records, and patient inputs to detect early warning signs.
Using AI and predictive analytics, it offers personalized insights, medication reminders, and lifestyle recommendations.
The agent supports diseases like diabetes, hypertension, and heart conditions with real-time monitoring and alerts.

It enables proactive care, reduces hospital visits, and improves patient adherence to treatment plans. This intelligent assistant bridges the gap between patients and providers, enhancing chronic care outcomes.

Technology - Use of IBM cloud lite services /IBM Granity is mandatory.

Problem Statement No.28 – Agentic AI Health Symptom Checker

The Challenge – An Agentic AI Health Symptom Checker helps users understand their health conditions by analyzing symptoms and providing probable causes, preventive advice, and care recommendations. It retrieves verified medical data, symptom databases, and guidelines from trusted sources like WHO, government health portals, and medical journals.
Users can input symptoms in natural language such as "I have a sore throat and fever," and the agent provides possible conditions, urgency level, home remedies, and when to consult a doctor.
It supports multi-language interaction and avoids self-diagnosis risks by offering educational and referral-based suggestions.
This AI-driven assistant promotes early detection, reduces misinformation, and empowers users to take informed health actions.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Problem Statement No.29 – Street Vendor Digitalization Agent

The Challenge – A Street Vendor Digitalization Agent, powered by RAG (Retrieval-Augmented Generation), helps local hawkers and micro-entrepreneurs become digitally visible by generating business profiles, UPI setup guides, local SEO strategies, and customer engagement tips.
It retrieves real-time policies, MSME schemes, geolocation of business data, digital onboarding steps, and consumer behavior insights from government portals, fintech apps, and commerce platforms.
Vendors can simply say, "I sell fruit in Pune's Camp area," and the agent will suggest pricing tips, online listing platforms, QR code setup, and promotional materials in their local language.

This AI-driven assistant empowers informal businesses to grow digitally, unlock access to credit, and boost visibility in the hyperlocal economy.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Problem Statement No.30 - Faculty Digital Profile Builder (RAG-Based)

The Challenge – Faculty members across higher education institutions are often required to maintain comprehensive academic profiles for accreditation (e.g., NAAC, NBA), research collaboration, promotions, and visibility. However, manually compiling, updating, and formatting data related to qualifications, publications, FDPs, patents, grants, and achievements is **time-consuming, error-prone, and inconsistent**.

Moreover, most institutions lack a standardized and intelligent system to generate and update faculty profiles dynamically from scattered sources like CVs, research repositories, certificates, and spreadsheets.

There is a need for a **smart, automated, and user-friendly solution** that can create and maintain rich, accurate digital profiles for faculty with minimal manual effort.

Technology – Use of IBM Cloud Lite services / IBM Granite is mandatory.

Electrical Engineering: (Agentic AI project)

Problem Statement No.31 – Smart Home Energy Advisor Agent

The Challenge:

A Smart Home Energy Advisor Agent acts like your personal electricity manager. It takes information from your smart meter and appliances, analyzes power usage, and gives you tips to save energy. The agent can answer questions like "Why is my bill so high this month?" or "What time should I run the washing machine to save money?". It uses AI to understand consumption patterns and provide simple recommendations.

Technology – Use of IBM Cloud Lite services and IBM Granite AI model is mandatory.

Electronics and Telecommunications Engineering: (Agentic AI project)

Problem statement No.32 – Audio Signal Processing Assistant Agent
The Challenge:
An Audio Signal Processing Agent assists in designing or debugging circuits like preamps, filters, and amplifiers. It can answer queries such as "Why is my audio amplifier producing noise?" or "How do I reduce distortion in my op-amp circuit?". The agent provides filter design suggestions, grounding tips, and noise elimination techniques.

Technology – Use of IBM Cloud Lite services and IBM Granite AI model is mandatory.

Mechanical Engineering: (Agentic AI project)
Problem Statement No. 33 – Machine Fault Diagnosis Agent
The Challenge:

This agent helps detect faults in machines like lathes, mills, or pumps based on vibrations, temperature, or unusual noises. It can answer: "Why is my CNC machine vibrating too much?" or "What could cause overheating in a hydraulic pump?". It suggests basic maintenance actions and safety precautions.

Technology – Use of IBM Cloud Lite services and IBM Granite AI model is mandatory.

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Problem Statements on ML by using AI_KOSH data sets

Problem statement 34 - Predicting Eligibility for using Machine Learning

The Challenge:

The National Social Assistance Program (NSAP) is a flagship social security and welfare program by the Government of India. It aims to provide financial assistance to the elderly, widows, and persons with disabilities belonging to below-poverty-line (BPL) households. The program consists of several sub-schemes, each with specific eligibility criteria.
Manually verifying applications and assigning the correct scheme can be a time-consuming and error-prone process. Delays or incorrect allocation can prevent deserving individuals from receiving timely financial aid.
Your task is to design, build, and evaluate a multi-class classification model that can accurately predict the most appropriate NSAP scheme for an applicant based on their demographic and socio-economic data. The goal is to create a reliable tool that could assist government agencies in quickly and accurately categorizing applicants, ensuring that benefits are delivered to the right people efficiently.

AI Kosh dataset link –
https://aikosh.indiaai.gov.in/web/datasets/details/district_wise_pension_data_under_the_national_social_assistance_programme_nsap_1.html

Technology – Use of IBM cloud lite services is mandatory.

Problem statement 35 - Intelligent Classification of Rural Infrastructure Projects

The Challenge:

The Pradhan Mantri Gram Sadak Yojana (PMGSY) is a flagship rural development program in India, initiated to provide all-weather road connectivity to eligible unconnected habitations. Over the years, the program has evolved through different phases or schemes (PMGSY-I, PMGSY-II, RCPLWEA, etc.), each with potentially distinct objectives, funding mechanisms, and project specifications.
For government bodies, infrastructure planners, and policy analysts, efficiently categorizing thousands of ongoing and completed projects is crucial for effective monitoring, transparent budget allocation, and assessing the long-term impact of these schemes. Manual classification is time-consuming, prone to errors, and scales poorly.
Your specific task is to design, build, and evaluate a machine learning model that can automatically classify a road or bridge construction project into its correct PMGSY_SCHEME based on its physical and financial characteristics.

AI Kosh dataset link –
https://aikosh.indiaai.gov.in/web/datasets/details/pradhan_mantri_gram_sadak_yojna_pmgsy.html

Technology – Use of IBM cloud lite services is mandatory.

Problem statement 36: Tracking Maternal Health Progress Toward SDG 3.1: A Global Data Analysis

The Challenge:

The Sustainable Development Goal 3.1 aims to reduce the global maternal mortality ratio to less than 70 per 100,000 live births by 2030. Monitoring progress towards this goal requires analyzing country-wise data on maternal mortality and associated health indicators such as antenatal care coverage, births attended by skilled personnel, adolescent birth rates, and healthcare expenditures. Despite global efforts, maternal health outcomes vary drastically between regions and income groups, raising the need for data-driven insights into the factors influencing maternal health.

AI Kosh dataset link:

https://www.data.gov.in/resource/sustainable-development-goals-national-indicator-framework-version-31-2021

Technology – Use of IBM cloud lite services is mandatory.

Problem Statement 37: Analyzing Demographic and Regional Disparities in Tele-Law Case Registrations for Inclusive Legal Access

Despite the expansion of the Tele-Law initiative across states and districts, there is limited understanding of demographic utilization patterns and regional disparities in legal aid access. The challenge is to analyze Tele-Law case registration data to uncover gender-wise, caste-wise, and geographic disparities in service utilization across CSCs. Uneven representation among marginalized groups (SC, ST, OBC) and low outreach in certain districts raise concerns about equity and effectiveness. Moreover, the varying number of CSCs per region complicates direct comparisons. This problem demands a data-driven approach to evaluate inclusivity and optimize service delivery.

Data set Link: **https://www.data.gov.in/resource/district-wise-tele-law-case-registration-and-advice-enabled-data-fy-2021-22-2024-25**

Technology – Use of IBM cloud lite services is mandatory.

Problem Statement No. 38 - Improved Source of Drinking Water

The Challenge: Access to safe and improved sources of drinking water remains a critical issue in India, especially in rural and underdeveloped regions. Despite ongoing efforts under the Sustainable Development Goals (SDGs), inequalities persist in water accessibility across states and socio-economic groups. This project aims to analyze data from the 78th Round of the Multiple Indicator Survey (MIS) to assess the percentage of the population with access to improved drinking water sources. It will also explore related indicators such as use of clean cooking fuel and migration trends. By identifying patterns and disparities, the study will generate actionable insights to support evidence-based policymaking. The ultimate goal is to help ensure equitable access to clean water and contribute to India's progress on SDG targets.

AI Kosh Dataset Link –
https://aikosh.indiaai.gov.in/web/datasets/details/improved_source_of_drinking_water_multiple_indicator_survey_78th_round.html

Technology - Use of IBM cloud lite services is mandatory.

Mechanical Engineering: (Machine Learning project)

Problem statement No.39 – Predictive Maintenance of Industrial Machinery

The Challenge:

Develop a predictive maintenance model for a fleet of industrial machines to anticipate failures before they occur. This project will involve analyzing sensor data from machinery to identify patterns that precede a failure. The goal is to create a classification model that can predict the type of failure (e.g., tool wear, heat dissipation, power failure) based on real-time operational data. This will enable proactive maintenance, reducing downtime and operational costs.

Kaggle dataset link – https://www.kaggle.com/datasets/shivamb/machine-predictive-maintenance-classification

Technology – Use of IBM cloud lite services is mandatory.

Electronics and Telecommunications Engineering: (Machine learning project)

Problem statement No.40 – Network Intrusion Detection

The Challenge:

Create a robust network intrusion detection system (NIDS) using machine learning. The system should be capable of analyzing network traffic data to identify and classify various types of cyber-attacks (e.g., DoS, Probe, R2L, U2R) and distinguish them from normal network activity. The goal is to build a model that can effectively secure communication networks by providing an early warning of malicious activities.

Kaggle dataset link – https://www.kaggle.com/datasets/sampadab17/network-intrusion-detection

Technology – Use of IBM cloud lite services is mandatory.

Electrical Engineering: (Machine learning project)

Problem statement No.41 – Power System Fault Detection and Classification

The Challenge:

Design a machine learning model to detect and classify different types of faults in a power distribution system. Using electrical measurement data (e.g., voltage and current phasors), the model should be able to distinguish between normal operating conditions and various fault conditions (such as line-to-ground, line-to-line, or three-phase faults). The objective is to enable rapid and accurate fault identification, which is crucial for maintaining power grid stability and reliability.

Kaggle dataset link – https://www.kaggle.com/datasets/ziya07/power-system-faults-dataset

Technology – Use of IBM cloud lite services is mandatory.

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