AI/ML HACKATHON 2024 PROJECT TOPIC DETAILS

***Respective of the domain you have chosen, please choose only one topic from the subdomains and mention the code for the chosen subdomain in the form.**

The details are as follows:

Healthcare

Sub Domains:

- **HEL-1**: Personalized Treatment Plans: Develop an AI system that customizes treatment plans by analyzing a patient's medical history, genetics, and lifestyle, improving healthcare outcomes.
- **HEL-2**: Remote Patient Monitoring: Create a real-time monitoring system using IoT devices and AI to predict and prevent health crises in patients with chronic illnesses.
- **HEL-3**: Predictive Analytics for Disease Outbreaks: Build an AI model to forecast disease outbreaks using public health data, social media trends, and environmental factors, enabling proactive measures.
- **HEL-4**: Virtual Health Assistant: Design an AI-powered assistant to provide medical advice, answer patient queries, and triage symptoms, enhancing patient engagement and care.
- **HEL-5**: Automated Medical Imaging Analysis: Develop an AI system to assist radiologists by automatically analyzing medical images, highlighting areas of concern, and improving diagnostic accuracy.
- **HEL-6**: Drug Discovery and Repurposing: Create an AI platform to identify new uses for existing drugs and expedite the drug discovery process, reducing time and cost.
- **HEL-7**: Healthcare Fraud Detection: Implement an AI-based solution to detect and prevent fraudulent activities in healthcare billing and insurance claims, ensuring financial integrity.
- **HEL-8**: Patient Emotion and Sentiment Analysis: Develop a natural language processing tool to analyze patient interactions and feedback, improving healthcare services and patient satisfaction.
- **HEL-9**: AI-Powered Mental Health Support: Create an AI application offering mental health support and early detection of mental health issues through user interaction and behavior analysis.
- **HEL-10**: Optimizing Hospital Operations: Use AI to optimize hospital operations, such as patient scheduling, resource allocation, and workflow management, enhancing efficiency and patient care.
- **HEL-11**: Others: Participants can propose innovative AI solutions addressing any healthcare-related challenge not covered by the predefined problem statements, fostering creativity and diverse solutions.

Marketing

Sub Domains:

- **MAR-1**: AI-Driven Customer Segmentation: Build a machine learning model to segment customers based on behavior, preferences, and demographics, tailoring marketing strategies effectively.
- **MAR-2**: Customer Loyalty Prediction: Build a machine learning model to predict customer loyalty and lifetime value, enabling targeted loyalty programs and personalized marketing efforts.
- **MAR-3**: Personalized Content Recommendations: Create an AI system delivering personalized content and product recommendations in real-time based on user interactions, boosting engagement and sales.
- **MAR-4**: Sentiment Analysis for Brand Reputation: Implement a natural language processing tool to analyze social media and customer reviews for brand sentiment and reputation management.
- **MAR-5**: Churn Prediction and Prevention: Create a predictive model to identify potential customer churn and recommend personalized retention strategies, reducing attrition rates.
- **MAR-6**: Voice Search Optimization: Develop an AI solution to optimize content for voice search, improving SEO strategies and visibility.
- **MAR-7**: Cross-Channel Marketing Attribution: Implement a machine learning model to accurately attribute conversions to different marketing channels, refining marketing efforts.
- **MAR-8**: Influencer Marketing Analysis: Build an AI tool to analyze and identify the most effective influencers for brand collaborations, based on engagement and audience data.
- **MAR-9**: Predictive Market Basket Analysis: Develop a machine learning model to predict customer purchase patterns and recommend complementary products in real-time, increasing cross-selling and upselling opportunities.
- **MAR-10**: Blockchain-Based AI Marketing Analytics: Develop a blockchain-enabled AI platform for transparent and secure marketing analytics, providing real-time insights into campaign performance, customer engagement, and ROI.
- **MAR-11**: Others: Participants are encouraged to suggest AI-driven projects that revolutionize marketing strategies or address emerging trends not outlined in the predefined problem statements, promoting originality.

Finance

Sub Domains:

- **FIN-1**: Fraud Detection and Prevention: Develop an AI system to detect and prevent fraudulent transactions in real-time using anomaly detection, ensuring financial security.
- **FIN-2**: Credit Risk Assessment: Create a machine learning model to assess credit risk and predict loan defaults, enhancing lending decisions.
- **FIN-3**: Personalized Financial Planning: Build an AI-powered financial advisor providing personalized investment and savings plans based on user goals and risk tolerance.
- **FIN-4**: Customer Service Automation: Implement a natural language processing tool for automating customer service queries and support in the financial sector, improving efficiency.
- **FIN-5**: Predictive Analytics for Stock Prices: Create a predictive model to forecast stock prices and market trends using historical data and news sentiment analysis.
- **FIN-6**: Financial Document Analysis: Build an AI system to analyze and extract insights from financial documents like balance sheets, income statements, and annual reports.
- **FIN-7**: Budgeting and Expense Tracking: Develop an AI application that helps users track expenses, budget effectively, and provide financial health recommendations.
- **FIN-8**: Anti-Money Laundering (AML) Compliance: Implement an AI solution to detect suspicious activities and ensure compliance with AML regulations, safeguarding financial systems.
- **FIN-9**: Portfolio Optimization: Create a machine learning model to optimize investment portfolios based on risk and return profiles, enhancing financial returns.
- **FIN-10**: Blockchain-Based Transaction Verification: Develop an AI tool to enhance the security and efficiency of transaction verification using blockchain technology, ensuring transparency and reducing fraud.
- **FIN-11**: Others: Participants have the freedom to propose AI applications in finance that tackle unique challenges or explore new opportunities outside the scope of the predefined problem statements, encouraging novel approaches.

HR

Sub Domains:

- **HR-1**: Automated Resume Screening: Develop an AI tool to screen and rank resumes based on job descriptions and candidate qualifications, streamlining the hiring process.
- **HR-2**: Employee Sentiment Analysis: Implement a natural language processing system to analyze employee feedback and sentiment from surveys and internal communications, improving workplace culture.
- **HR-3**: Predictive Employee Turnover: Create a predictive model to identify employees at risk of leaving the company and suggest retention strategies, reducing turnover rates.
- **HR-4**: Skill Gap Analysis: Build an AI system to analyze and identify skill gaps within the organization, recommending targeted training programs.
- **HR-5**: Diversity and Inclusion Monitoring: Develop an AI tool to monitor and promote diversity and inclusion within the workplace, fostering a more equitable environment.
- **HR-6**: Automated Onboarding Processes: Create an AI-powered onboarding assistant to streamline new employee orientation and training, enhancing the onboarding experience.
- **HR-7**: Performance Management and Evaluation: Implement an AI system to evaluate employee performance and provide personalized feedback and development plans, improving productivity.
- **HR-8**: Employee Engagement Prediction: Build a predictive model to assess employee engagement levels and suggest interventions to improve morale, increasing job satisfaction.
- **HR-9**: AI-Powered Recruitment Chatbot: Develop a chatbot to handle initial candidate interactions, answer queries, and schedule interviews, optimizing recruitment processes.
- **HR-10**: Workforce Planning and Optimization: Create an AI solution to optimize workforce planning, scheduling, and resource allocation, improving operational efficiency.
- **HR-11**: Others: Participants can propose AI solutions for HR challenges beyond the predefined problem statements, focusing on enhancing workplace dynamics, diversity, and employee well-being through innovative technologies.

Cyber Security

Sub Domains:

- **SEC-1**: Real-Time Threat Detection: Develop an AI system for real-time detection and response to cyber threats using anomaly detection and machine learning, enhancing security.
- **SEC-2**: Phishing Attack Prevention: Build an AI tool to identify and block phishing attempts by analyzing email content and sender behavior, protecting sensitive information.
- **SEC-3**: Automated Incident Response: Create an AI-powered system to automate incident response and remediation processes, reducing response times and mitigating risks.
- **SEC-4**: User Behavior Analytics: Implement an AI solution to analyze user behavior and detect insider threats or compromised accounts, safeguarding organizational assets.
- **SEC-5**: Network Traffic Analysis: Develop an AI model to monitor and analyze network traffic for unusual patterns indicative of cyber attacks, improving network security.
- **SEC-6**: Vulnerability Assessment and Management: Create an AI tool to identify and prioritize security vulnerabilities within an organization's infrastructure, enhancing risk management.
- **SEC-7**: Fraud Detection in Online Transactions: Build an AI system to detect and prevent fraudulent activities in online transactions, ensuring financial integrity.
- **SEC-8**: AI-Powered Penetration Testing: Develop a tool that uses AI to simulate penetration tests and identify security weaknesses, strengthening defenses.
- **SEC-9**: Data Privacy and Compliance Monitoring: Implement an AI solution to ensure compliance with data privacy regulations and monitor for data breaches, protecting sensitive data.
- **SEC-10**: Malware Detection and Analysis: Create an AI model to detect and analyze malware threats in real-time, preventing cyber attacks and ensuring system security.
- **SEC-11**: Others: Participants are invited to propose AI-based cybersecurity solutions that address unconventional threats or vulnerabilities not covered by the predefined problem statements, encouraging adaptive security measures.

Dynamic Routing/Transportation

Sub Domains:

- **DRT-1**: Optimal Route Planning: Develop an AI system to optimize routes for phlebotomists, considering traffic, distance, and appointment schedules, improving efficiency.
- **DRT-2**: Real-Time Route Adjustments: Create an AI tool that provides real-time route adjustments based on traffic conditions and last-minute appointment changes, enhancing service reliability.
- **DRT-3**: Predictive Maintenance for Vehicles: Implement a predictive maintenance system to monitor vehicle health and prevent breakdowns, ensuring continuous operation.
- **DRT-4**: Appointment Scheduling Optimization: Build an AI solution to optimize appointment scheduling for phlebotomists based on location and availability, maximizing productivity.
- **DRT-5**: Dynamic Fleet Management: Develop an AI-powered fleet management system to monitor and manage phlebotomist vehicles in real-time, improving operational control.
- **DRT-6**: Customer Wait Time Prediction: Create a predictive model to estimate and minimize customer wait times for phlebotomy services, enhancing customer satisfaction.
- **DRT-7**: Route Efficiency Analytics: Implement an AI tool to analyze route efficiency and suggest improvements for cost and time savings, optimizing logistics.
- **DRT-8**: Emergency Response Optimization: Build a system to optimize emergency response routes for phlebotomists in urgent medical situations, ensuring timely interventions.
- **DRT-9**: Environmental Impact Reduction: Develop an AI solution to minimize the environmental impact of phlebotomist transportation through route optimization and fuel efficiency.
- **DRT-10**: Safety Monitoring and Alerts: Create an AI system to monitor phlebotomist safety during transportation and provide real-time alerts for potential hazards, ensuring personal safety.
- **DRT-11**: Others: Participants have the opportunity to propose AI solutions for optimizing transportation and logistics challenges beyond the predefined problem statements, focusing on efficiency, sustainability, or safety enhancements.

Computer Vision

Sub Domains:

- **CV-1**: Real-Time Object Detection: Develop a computer vision system for real-time object detection and tracking in various environments, enhancing automation and monitoring.
- **CV-2**: Facial Recognition for Security: Create a facial recognition tool for enhanced security and access control in sensitive areas, improving safety measures.
- **CV-3**: Automated Quality Inspection: Build an AI solution to automate quality inspection in manufacturing processes using computer vision, ensuring product consistency and reducing defects.
- **CV-4**: Medical Image Analysis: Develop a computer vision model to analyze medical images and assist in diagnosis and treatment planning, improving healthcare outcomes.
- **CV-5**: AR/VR Content Generation: Implement a tool to generate augmented reality (AR) and virtual reality (VR) content using computer vision techniques, enhancing user experiences.
- **CV-6**: Document Digitization and OCR: Develop an optical character recognition (OCR) tool to digitize and analyze documents, improving data accessibility and management.
- **CV-7**: Gesture Recognition for Human-Computer Interaction: Create a computer vision model to recognize and interpret human gestures for more intuitive interaction with computers.
- **CV-8**: Security Surveillance Automation: Implement a computer vision solution to automate security surveillance and detect unusual activities, enhancing security protocols.
- **CV-9**: Emotion Recognition in Videos: Develop a computer vision model to analyze facial expressions and body language in videos, detecting and interpreting human emotions for applications in customer service and entertainment.
- **CV-10**: AI-Enhanced Facial Recognition for Health Monitoring: Implement a computer vision solution that utilizes facial recognition to monitor vital signs and detect early signs of health issues, enabling proactive healthcare interventions.
- **CV-11**: Others: Participants can propose innovative applications of computer vision technology that address unique challenges or opportunities not included in the predefined problem statements, promoting cutting-edge visual recognition solutions.

Natural Language Processing

Sub Domains:

- **NLP-1**: Real-Time Language Translation: Develop a real-time language translation tool for seamless communication across different languages, breaking language barriers.
- **NLP-2**: Automated Customer Support: Build an NLP-powered chatbot to handle customer support queries and provide accurate responses, improving customer service efficiency.
- **NLP-3**: Text Summarization for News Articles: Develop a text summarization tool to generate concise summaries of news articles and reports, enhancing information consumption.
- **NLP-4**: Voice Command Recognition: Implement a voice recognition system to interpret and execute voice commands in various applications, improving user interactions.
- **NLP-5**: Named Entity Recognition for Legal Documents: Create an NLP tool to extract and identify key entities in legal documents, streamlining legal research and analysis.
- **NLP-6**: Emotion Detection in Text: Build a model to detect and analyze emotions expressed in text for improved human-computer interaction, enhancing user experiences.
- **NLP-7**: Speech-to-Text Transcription: Develop an accurate speech-to-text transcription tool for various languages and dialects, improving accessibility and documentation.
- **NLP-8**: AI-Powered Content Generation: Create an NLP tool to generate high-quality content for blogs, articles, and marketing materials, enhancing content creation processes.
- **NLP-9**: Language Model for Code Completion: Implement a language model to assist developers by providing code suggestions and auto-completion, improving coding efficiency.
- **NLP-10**: Semantic Search Engine: Implement an NLP-based semantic search engine that understands the context and meaning of user queries to deliver more accurate and relevant search results.
- **NLP-11**: Others: Participants are welcome to propose AI-driven projects in natural language processing that explore novel applications or address specific linguistic challenges not outlined in the predefined problem statements, encouraging linguistic creativity.

Clinical Research

Sub Domains:

- **CLR-1**: Patient Recruitment Optimization: Develop an AI system to identify and recruit suitable patients for clinical trials using electronic health records and social media data, improving trial efficiency.
- **CLR-2**: Adverse Event Prediction: Create a predictive model to identify potential adverse events in clinical trials based on patient data and trial protocols, ensuring patient safety.
- **CLR-3**: Automated Data Extraction and Analysis: Build a tool to automate the extraction and analysis of clinical trial data from various sources, streamlining research processes.
- **CLR-4**: Trial Design and Simulation: Develop an AI-powered platform to design and simulate clinical trials, optimizing protocols for efficiency and efficacy, reducing trial costs.
- **CLR-5**: Patient Adherence Monitoring: Implement a system to monitor and improve patient adherence to clinical trial protocols using wearable devices and AI, enhancing trial outcomes.
- **CLR-6**: Natural Language Processing for Medical Records: Create an NLP tool to extract relevant information from medical records for clinical research purposes, improving data accuracy.
- **CLR-7**: Drug Efficacy Prediction: Build a predictive model to assess the potential efficacy of new drugs based on preclinical data and early trial results, accelerating drug development.
- **CLR-8**: Regulatory Compliance Monitoring: Develop an AI solution to ensure compliance with regulatory requirements in clinical trials, reducing the risk of non-compliance.
- **CLR-9**: AI-Powered Patient Feedback Analysis: Implement a tool to analyze patient feedback and improve the design and execution of clinical trials, enhancing patient engagement.
- **CLR-10**: Clinical Trial Site Optimization: Create a system to optimize the selection and management of clinical trial sites for better efficiency and data quality, improving trial success rates.
- **CLR-11**: Others: Participants have the flexibility to propose AI solutions for clinical research that address unconventional challenges or leverage emerging technologies not covered by the predefined problem statements, promoting advancements in medical research and patient care.