# JNTUVGV  PyTech  Arena  2026
## Level 3 – Advanced Python & Python Full Stack Track

# General Guidelines

- This level focuses on real-world Full Stack problem solving.

- Full Stack solutions must include frontend, backend, and database integration.

- Teams must submit:

  – Source Code

  – Dataset preprocessing report

  – Model/System architecture diagram

  – PPT Presentation with results

- Use of pre-trained models must be justified.

- Backend must be in Python use only python full stack. like (Flask ,Django).

# Evaluation Criteria

- Problem Understanding

- Data Preprocessing / System Design

- Model Selection / Architecture

- Innovation

- AI Integration

- Startup Idea

- Performance / Functional Output

- Optimization / Security Enhancements

- Presentation & Technical Defense

# Python  Full  Stack  Problems  (2)

## Problem  1: Student  Result  Management  System

Objective:  Build  a  full-stack  web  application  for  managing  student  records.
Requirements:

- Frontend  using  HTML/CSS/Bootstrap

- Backend  using  Flask/Django

- MySQL  or  SQLite  database

- CRUD   operations

- Role-based   authentication

## Problem 2: College Event Registration Portal

Objective: Develop an online event registration and management system.

Requirements:

- User authentication system

- Event creation and registration

- Database integration

- Email confirmation feature

- Deployment readiness

Problem 2: College Event Registration Portal

# 3.Problem Statement for JNTUGV Alumni Portal

The Jawaharlal Nehru Technological University Gurajada Vizianagaram (JNTUGV) currently lacks a unified digital platform to connect its alumni with the institution, departments, and current stakeholders. This absence of a centralized alumni portal has led to fragmented communication, inefficient alumni engagement, and limited opportunities for professional networking, mentorship, and institutional development.

To address this gap, a **web-based alumni portal** is proposed that facilitates interaction between alumni, faculty, administration, and university officials. The system will support **five types of users** with clearly defined roles and privileges:

1. **Admin**
   - Manage user accounts: add, delete, and approve alumni registrations.
   - Create and manage departments.
   - Add Heads of Departments (HODs).
   - Moderate and approve alumni-submitted testimonials before publishing on the main page.

2. **Principal**
   - Access an overview of alumni activities and departmental engagements.
   - Monitor contributions and interactions across departments.

3. **Head of Department (HOD)**
   - View the list of alumni associated with their department.
   - Communicate directly with alumni through messaging features.
   - Monitor department-specific alumni contributions.

4. **Alumni Coordinator**
   - Oversee alumni registrations and departmental updates.
   - Act as a bridge between alumni, HODs, and administration.
   - Facilitate approval processes where necessary.

5. **Alumni (Students who have graduated)**
   - Register themselves on the portal through an online form.
   - Upload their profile pictures and provide optional social media links (Instagram, Facebook, LinkedIn).
   - Submit testimonials about their department, college, or university for admin approval.
   - Create and participate in discussion threads to share experiences, opportunities, and knowledge.

The portal must ensure **role-based access control**, providing a secure environment where each stakeholder can perform tasks relevant to their responsibilities. Furthermore, the system should emphasize usability, seamless navigation, and structured alumni data management.

By implementing this alumni portal, JNTUGV will establish a sustainable digital ecosystem that strengthens alumni relationships, enhances departmental visibility, and promotes institutional growth through continuous alumni engagement.

# 4.Problem Statement for University Feedback Management System

Universities require continuous feedback from students, faculty, and stakeholders to evaluate academic quality, teaching effectiveness, infrastructure, and overall institutional performance. At present, the feedback collection process in many universities is either manual, inconsistent, or fragmented across different departments. This leads to issues such as lack of transparency, inefficiency in analysis, difficulty in tracking responses, and limited actionable insights for administrators.

To address these challenges, a **web-based Feedback Management System** is proposed that enables structured collection, analysis, and reporting of feedback across multiple stakeholders. The system will provide role-based access and functionalities to ensure that administrators, faculty, and students can participate effectively while maintaining confidentiality and data integrity.

The system will support the following types of users with defined roles and privileges:

**Admin**

- Create and manage departments, courses, and faculty accounts.
- Design and publish feedback forms/questionnaires (course feedback, faculty evaluation, infrastructure feedback, etc.).
- View and analyze consolidated reports across departments and programs.
- Maintain system security, access control, and data backups.

**Principal**

- Access institution-wide feedback analytics and summaries.
- Monitor department-level performance and identify areas for improvement.
- Use feedback data for strategic decision-making and quality enhancement.

**Head of Department (HOD)**

- Access department-specific feedback reports.
- Monitor faculty performance and teaching effectiveness based on student feedback.
- Provide necessary recommendations or interventions for departmental growth.

**Faculty**

- Access anonymous feedback reports related to their courses and teaching.

- Use insights to improve teaching methodologies and interaction with students.

- Respond to suggestions or areas flagged in feedback, if required.

**Students**

- Submit feedback through structured online forms on courses, faculty, infrastructure, and overall experience.

- Provide both quantitative (rating-based) and qualitative (comments/suggestions) feedback.

- Remain assured of anonymity to encourage honesty and openness.

The system must ensure **role-based access control, data confidentiality, and automated report generation** to assist in decision-making. Additionally, the portal should prioritize usability, secure data handling, and scalability for future institutional requirements.

By implementing this feedback management system, the university will establish a **transparent, efficient, and structured mechanism** for continuous quality improvement, enhanced teaching-learning processes, and stronger institutional accountability.

# 5.Problem Statement for University Issue Management System

Universities often face operational, academic, and infrastructure-related issues reported by students, faculty, or administrative staff. At present, the reporting and resolution process for such issues is largely manual, fragmented across departments, and lacks transparency. This results in delayed responses, unresolved complaints, and reduced trust in the system of grievance handling. Furthermore, without a structured platform, it becomes difficult for administrators to track, prioritize, and resolve issues efficiently.

To address these challenges, a **web-based Issue Management System** is proposed that provides a centralized platform for reporting, tracking, and resolving issues raised within the university. The system will ensure transparency, accountability, and timely resolution by involving all stakeholders with well-defined roles and privileges.

The system will support the following types of users with specific responsibilities:

**Admin**

- Create and manage user accounts across departments.

- Assign issues to concerned authorities for resolution.

- Monitor overall issue status and generate reports on complaints, resolutions, and response times.

- Maintain system security, access privileges, and data integrity.

**Principal**

- Access consolidated issue reports across all departments.

- Monitor resolution trends and intervene in critical or unresolved cases.

- Ensure accountability in issue-handling processes at the university level.

**Head of Department (HOD)**

- Receive department-specific issues raised by students or faculty.

- Assign and track issue resolution within their department.

- Communicate resolution progress and close issues once addressed.

**Faculty/Staff**

- Report academic or administrative issues affecting their teaching or departmental operations.

- Access and track the resolution status of issues they raise.

- Provide input or feedback once an issue is resolved.

**Students**

- Submit issues or complaints related to academics, infrastructure, facilities, or other university services.

- Track the progress of their submitted issues in real time.

- Receive updates and notifications when their issues are addressed or resolved.

The system must ensure **role-based access control, transparent workflows, and timely notifications** for all stakeholders. It should also provide analytical reports for administrators to identify recurring problems and improve institutional efficiency.

By implementing this issue management system, the university can create a **centralized, transparent, and efficient platform** for grievance redressal, thereby enhancing student satisfaction, faculty support, and institutional accountability.

# 6.Problem Statement for University Learning Management System (LMS)

In many universities, the management of academic resources, course materials, assessments, and communication between faculty and students is fragmented across different platforms or handled manually. This leads to inefficiencies such as delayed sharing of study materials, limited accessibility, lack of centralized tracking for student progress, and inadequate support for blended and online learning environments. As education increasingly incorporates digital

tools, the absence of a unified Learning Management System (LMS) restricts the university's ability to deliver effective, flexible, and technology-driven learning experiences.

To overcome these challenges, a **web-based Learning Management System** is proposed that serves as a centralized platform for teaching, learning, and academic collaboration. The system will ensure seamless interaction between faculty, students, and administrators while providing structured tools for managing courses, assignments, examinations, and performance tracking.

The proposed LMS will support the following types of users with clearly defined roles and privileges:

**Admin**

- Create and manage user accounts for faculty and students.

- Add and manage courses, departments, and academic schedules.

- Monitor platform usage, maintain system security, and generate reports.

**Principal/University Administrator**

- Oversee institution-wide course activities and performance analytics.

- Ensure compliance with academic standards and digital learning policies.

- Evaluate course effectiveness and student engagement.

**Head of Department (HOD)**

- Monitor department-specific courses and faculty activities.

- Track student performance and participation at the departmental level.

- Coordinate curriculum delivery and ensure course alignment with university standards.

**Faculty**

- Create and manage courses, upload lecture materials, and share resources.

- Conduct online quizzes, assignments, and assessments.

- Track student attendance, participation, and performance.

- Communicate with students through announcements and discussion forums.

**Students**

- Access digital course materials, lecture notes, and recorded sessions.

- Submit assignments, take online quizzes, and view results.

- Participate in discussion forums, interact with faculty, and collaborate with peers.

- Track personal progress and performance through dashboards.

The system must ensure **role-based access control, secure data storage, mobile accessibility, and user-friendly navigation**. Additionally, the LMS should support scalability, allowing integration with third-party tools such as video conferencing platforms, plagiarism detection systems, and digital libraries.

By implementing this Learning Management System, the university will create a **centralized, efficient, and technology-driven academic ecosystem** that enhances teaching quality, improves student learning outcomes, and supports continuous academic excellence.

# 7.Problem Statement for QR-Based Event Registration System

Universities frequently organize academic, cultural, technical, and extracurricular events that require efficient registration and participant management. The current process of handling event registrations is often manual or based on simple online forms, leading to issues such as duplicate registrations, delays in verification, difficulty in managing participant data, and lack of real-time attendance tracking. These inefficiencies reduce the overall event experience for both organizers and participants, and make post-event analysis difficult.

To address these challenges, a **QR-Based Event Registration System** is proposed that automates the registration, verification, and attendance process using QR codes. The system will generate a unique QR code for each registered participant, which can be scanned at the event venue for quick verification and entry. This ensures faster check-ins, eliminates manual errors, and provides organizers with accurate participant data.

The system will support the following user roles with defined privileges:

**Admin/Event Coordinator**

- Create and manage events with details such as name, venue, schedule, and eligibility.

- Approve or reject participant registrations.

- Generate unique QR codes for each participant upon approval.

- Track attendance in real time by scanning QR codes at the venue.

- Access post-event reports such as participant count, attendance rate, and feedback.

**Organizers/Volunteers**

- Assist in scanning QR codes at the entry point.

- Verify participant details instantly during check-in.

- Help with on-the-spot registrations if required.

**Participants (Students/Faculty/Guests)**

- Register online for university events by filling in necessary details.

- Receive a confirmation email or SMS containing their unique QR code.

- Present the QR code (digital or printed) at the event venue for entry.

- Optionally provide post-event feedback through the system.

The system must ensure **unique QR code generation, secure data handling, fast scanning, and real-time synchronization** of attendance records. Additionally, it should support both web and mobile interfaces to ensure accessibility for participants and ease of use for event organizers.

By implementing this QR-Based Event Registration System, the university can establish a **modern, efficient, and reliable solution** for managing events, improving participant experience, and enabling organizers to focus on delivering successful programs rather than administrative tasks.

# 8.Problem Statement for University NSS Activities Portal

The National Service Scheme (NSS) plays a vital role in promoting social responsibility, community engagement, and volunteerism among students across universities. However, in many institutions, the management of NSS activities remains unstructured. With 34 affiliated colleges under the university, there is no centralized platform to document, monitor, and showcase NSS events such as community service drives, awareness programs, and social outreach initiatives. As a result, activities conducted by different colleges often go unnoticed, records are maintained in scattered formats, and higher-level monitoring by the NSS Officer becomes inefficient.

To address these challenges, a **web-based NSS Activities Portal** is proposed that enables each affiliated college to upload details of NSS events along with photographs, reports, and participation data. The portal will serve as a centralized repository where the NSS Officer can view, track, and evaluate activities conducted across all 34 colleges. This will ensure transparency, structured record-keeping, and recognition of the university's collective contributions to social initiatives.

The system will support the following user roles with defined privileges:

**Admin/NSS Officer**

- Manage accounts of colleges participating in NSS activities.

- View uploaded event details and photographs from all 34 colleges.

- Generate consolidated reports of NSS activities across the university.

- Monitor participation levels, types of activities, and impact assessment.

**College NSS Coordinators (One per College)**

- Upload event details such as title, date, venue, description, and participants.

- Upload photographs, documents, and reports related to each event.

- Maintain a record of all events organized by their college.

**General Users (Students/Public View)**

- Browse highlights of NSS activities across all colleges.

- View photographs, reports, and summaries of events (if approved by the officer).

- Gain awareness of the university's social outreach programs.

The system must ensure **role-based access, secure data storage, photo/document uploads, and easy navigation** for users. Additionally, the portal should support search and filter options by college, date, or type of event to simplify monitoring and reporting.

By implementing this NSS Activities Portal, the university will establish a **centralized, transparent, and scalable digital platform** that not only streamlines reporting and monitoring but also highlights the social contributions of its 34 affiliated colleges, strengthening both institutional accountability and community engagement.

# 9.Problem Statement for University Placement Support System

University placements are a critical stage for students as they transition from academic life to professional careers. However, in many institutions, the process of collecting, managing, and sharing student placement data is fragmented, often handled through spreadsheets or manual documentation. This creates challenges such as incomplete or inconsistent student information, lack of structured profiles for companies to review, difficulty in matching student skills with job opportunities, and delays in communication between placement officers, companies, and students.

To address these challenges, a **web-based Placement Support System** is proposed that allows students to register and maintain their placement-related profiles in a centralized database. The system will capture key details such as academic performance, skills, certifications, projects, and career preferences. Placement officers can access these profiles, verify details, and generate consolidated reports to share with company consultancies. This will help recruiters gain a clear understanding of the university's talent pool and enable efficient student–company matching.

The system will support the following user roles with specific privileges:

**Admin/Placement Officer**

- Manage student registrations and verify submitted profiles.

- Generate department-wise or skill-based reports of eligible students.

- Share structured student data with company consultancies.

- Track placement status and maintain records of student offers.

**Students**

- Register on the portal and create detailed placement profiles (academic scores, skills, internships, projects, certifications, etc.).

- Upload resumes, photographs, and supporting documents.

- Update and edit their details as needed for accuracy.

- Track placement status and opportunities shared by the placement cell.

**Company Consultancy/Recruiters (View Access)**

- Access consolidated reports provided by placement officers.

- Review structured student profiles based on eligibility criteria.

- Gain insights into the overall quality and preparedness of students from the university.

The system must ensure **role-based access, secure handling of student data, and standardized profile formats** so that companies can quickly analyze student capabilities. Furthermore, it should support report generation, easy updates by students, and filtering mechanisms based on criteria like GPA, skills, or department.

By implementing this Placement Support System, the university can create a **centralized, reliable, and transparent platform** that enhances placement readiness, improves recruiter engagement, and increases student employment opportunities.