PROJECT IDEAS · B.TECH / B.E. CSE AND IT

Final year project ideas for *CSE*

A good final year project idea for CSE or IT is one your team can **finish, demo live and explain**: a real problem, public data you are allowed to use, and one clear result you can defend.

Last updated 2026-10-18

By The Ultimate Project World team

Below are 53 final year project ideas for CSE, IT and computer science students across eight domains, each with a one-line pitch, a difficulty level, a typical stack, a named public dataset or API, and the angle that makes it easy to explain in a viva.

KEY POINTS

- **53 ideas across eight domains:** AI and machine learning, deep learning and vision, NLP and generative AI, web and mobile apps, cybersecurity, blockchain, cloud and DevOps, and data science.
- **Each idea gives** a difficulty level, a typical stack, a named public dataset or API and a viva angle.
- **Start from the viva, not the title.** Examiners ask why you chose the method, what you compared it with and what fails.
- **Mini or major?** A mini project proves one technique works; a major project wraps it in a complete, tested system.
- **These are topic ideas, not delivered projects.** Discuss them with your guide, and check each dataset's licence before you use it.

How do you pick a final year project idea you can defend?

Start from the viva, not the title. Examiners ask why you chose the method, what you compared it with, and what fails. An idea is a good fit if your team can answer those three questions for it before you write a line of code.

Then match the domain to your team. The table shows what each domain needs and the question you are most likely to face.

Which CSE project domain suits your team?

DOMAIN	PICK IT IF	YOU WILL NEED	LIKELY VIVA QUESTION
AI and machine learning	You like data and want results early	Python and a laptop	Why this model and not a simpler one?
Deep learning and vision	You want a strong visual demo	Free Colab or Kaggle GPU sessions for training	How do you know it is not learning the background?
NLP and generative AI	You want the most current topic	An LLM API key, or a machine that runs a small local model	How do you stop it making things up?
Web and mobile apps	You want a product people can use	One full-stack framework and free hosting	What happens when two users do this at once?
Cybersecurity	You like systems, attacks and defences	Linux and a virtual-machine lab you own	How did you test it without touching a real system?
Blockchain	You can explain why a shared ledger is needed	Solidity or Hyperledger Fabric and a testnet wallet	Why not just use a database?
Cloud and DevOps	You enjoy automation and infrastructure	Docker and a cloud free tier or local Kubernetes	What does it cost to run, and how does it fail?
Data science	You like analysis and dashboards	pandas and a dashboard tool	What is your baseline, and did you beat it?

Your syllabus and guide decide what is acceptable; use this to shortlist, then confirm.

Difficulty labels below mean: **Beginner**, one model or module and a simple interface; **Intermediate**, a complete app with an evaluation against a baseline; **Advanced**, several components, heavier training or security-sensitive work. Want the whole final year project list on one screen? Jump to all 53 ideas in one table, which you can filter by language (Python, JavaScript or Java) and level.

Topic ideas, not delivered projects

These are starting points to discuss with your guide. Check each dataset's licence before you use it. Our delivered work is in the case studies.

Which AI and machine learning projects work well in final year?

TOPIC IDEA · BEGINNER

Heart-disease risk checker that explains itself

Predict risk from routine clinical fields and show which fields pushed each score up.

− Stack, data and viva angle

Stack: Python, scikit-learn, SHAP, Streamlit
Data: UCI Heart Disease
Viva angle: logistic regression against a random forest, and one patient's SHAP plot.

TOPIC IDEA · BEGINNER

Crop recommender that checks the forecast

Suggest a crop from soil nutrients and pH, then flag it if the coming week's weather is a poor fit.

− Stack, data and viva angle

Stack: scikit-learn, Flask
Data: Kaggle's Crop Recommendation dataset and the Open-Meteo API (no key needed)
Viva angle: which soil feature matters most, and why.

TOPIC IDEA · INTERMEDIATE

Credit-risk model with a fairness audit

Predict loan risk, then measure whether outcomes differ across age or sex groups.

− Stack, data and viva angle

Stack: scikit-learn, Fairlearn
Data: UCI Statlog (German Credit)
Viva angle: one chart showing the accuracy cost of fairer outcomes.

TOPIC IDEA · BEGINNER

Telecom churn predictor with a call list

Score each customer's churn risk and rank who to contact first.

− Stack, data and viva angle

Stack: pandas, XGBoost, Streamlit
Data: IBM's Telco Customer Churn sample
Viva angle: why precision in the top 10% matters more than overall accuracy.

TOPIC IDEA · INTERMEDIATE

Diabetes screener from survey answers

Predict diabetes risk from lifestyle and health-survey fields, with the class imbalance handled properly.

Stack, data and viva angle

Stack: scikit-learn, imbalanced-learn, FastAPI
Data: UCI CDC Diabetes Health Indicators
Viva angle: recall against precision for a screening tool; SMOTE against class weights.

TOPIC IDEA · INTERMEDIATE

Household electricity forecaster

Forecast tomorrow's consumption and flag unusual spikes.

Stack, data and viva angle

Stack: pandas, LightGBM or Prophet, Plotly Dash
Data: UCI Individual Household Electric Power Consumption
Viva angle: beating a "same as yesterday" baseline.

TOPIC IDEA · INTERMEDIATE

Hybrid movie recommender

Blend collaborative filtering with genre and tag similarity so new users still get sensible picks.

Stack, data and viva angle

Stack: Python, scikit-surprise, React
Data: MovieLens (GroupLens)
Viva angle: the cold-start problem, and precision@k explained.

What are good deep learning and computer vision project ideas?

TOPIC IDEA · BEGINNER

Handwritten Devanagari character reader

A CNN reads letters and digits drawn on a web canvas.

Stack, data and viva angle

Stack: PyTorch or Keras, HTML canvas
Data: UCI Devanagari Handwritten Character Dataset
Viva angle: the confusion matrix for look-alike letters.

TOPIC IDEA · BEGINNER

Traffic-sign recogniser tested on real Indian photos

Train on a public benchmark, then test on signs you photograph locally, in blur and low light.

Stack, data and viva angle

Stack: Keras, OpenCV
Data: GTSRB (German Traffic Sign Recognition Benchmark) plus your own photos
Viva angle: how accuracy drops on unfamiliar signs, and what augmentation recovers.

TOPIC IDEA · INTERMEDIATE

Pothole and crack detector for road videos

Detect road damage in phone video and pin each detection on a map.

Stack, data and viva angle

Stack: Ultralytics YOLO, OpenCV, Leaflet
Data: RDD2022, which includes road images from India
Viva angle: mAP explained using your own clips.

TOPIC IDEA · INTERMEDIATE

Food photo to nutrition estimate

Recognise a dish, then look up its nutrients per serving.

Stack, data and viva angle

Stack: PyTorch (EfficientNet fine-tune), FastAPI
Data: Food-101 and the USDA FoodData Central API (free key)
Viva angle: why portion size keeps calorie numbers rough.

TOPIC IDEA · INTERMEDIATE

Brain-tumour MRI classifier with heatmaps

Classify MRI slices and show a Grad-CAM heatmap for every prediction.

Stack, data and viva angle

Stack: PyTorch, Grad-CAM, Streamlit
Data: public brain-tumour MRI sets on Kaggle (check each licence)
Viva angle: why a heatmap is not a diagnosis. Our delivered M.Tech Parkinson's detection project shows the same Grad-CAM idea.

TOPIC IDEA · ADVANCED

Deepfake face detector tested on unseen methods

Train on some manipulation methods and test on the ones it has never seen.

Stack, data and viva angle

Stack: PyTorch, EfficientNet or Xception, a face detector for cropping
Data: FaceForensics++ (access by request)
Viva angle: the drop from seen to unseen methods, and the effect of compression.

TOPIC IDEA · INTERMEDIATE

Yoga pose coach

Webcam body landmarks, joint angles and spoken corrections.

Stack, data and viva angle

Stack: MediaPipe Pose Landmarker, Python or JavaScript
Data: none needed; record your own reference poses
Viva angle: angle rules against a trained classifier.

Which NLP and generative AI projects are current in 2026?

For one NLP project worked through end to end, with the Jigsaw dataset, TF-IDF and BERT models, per-label results and a bias check, read the toxic comment classification project guide.

TOPIC IDEA · ADVANCED

Q&A assistant for India's new criminal laws

A retrieval-augmented (RAG) assistant that answers from the BNS, BNSS and BSA, which came into force on 1 July 2024, and cites the section it used.

Stack, data and viva angle

Stack: LangChain or LlamaIndex, FAISS or Chroma, an open model through Ollama
Data: bare acts from India Code
Viva angle: the retrieved section shown next to each answer, and faithfulness scored on questions you write. Label it "not legal advice".

TOPIC IDEA · ADVANCED

News summariser for Hindi and Marathi

Fine-tune a multilingual model and compare its summaries with English ones.

Stack, data and viva angle

Stack: Hugging Face Transformers, mT5 or IndicBART
Data: XL-Sum (BBC articles, including Hindi and Marathi)
Viva angle: what ROUGE measures, and what it misses.

TOPIC IDEA · INTERMEDIATE

Aspect-based review analyser

Split product reviews into aspects such as battery, camera and delivery, and score each one.

Stack, data and viva angle

Stack: spaCy, a fine-tuned BERT-family model, Streamlit
Data: Amazon Reviews 2023 (McAuley Lab)
Viva angle: a review that is positive overall but negative on one aspect.

TOPIC IDEA · INTERMEDIATE

AI-written text detector, stress-tested

Classify human and chatbot answers, then test it on paraphrased text.

Stack, data and viva angle

Stack: RoBERTa fine-tune, perplexity features
Data: HC3 (Human ChatGPT Comparison Corpus)
Viva angle: why detectors fail on edited text, and the cost of a false accusation.

TOPIC IDEA · ADVANCED

Ask your college database in English

Turn questions into read-only SQL, run them safely and show the result as a table.

Stack, data and viva angle

Stack: an open LLM with schema prompts, SQLite, FastAPI
Data: the Spider text-to-SQL benchmark plus your own sample database
Viva angle: execution accuracy, and the guardrails that block data-changing queries.

TOPIC IDEA · INTERMEDIATE

Voice form-filler for Hindi and Marathi

Speak your answers; the app transcribes them and fills in a form.

Stack, data and viva angle

Stack: Whisper (open source), FastAPI, a progressive web app
Data: your own recorded test phrases
Viva angle: word error rate across speakers and background noise.

TOPIC IDEA · INTERMEDIATE

Question-paper drafter tagged by Bloom's level

Draft questions from a chapter PDF and tag each by Bloom's taxonomy level for a teacher to review.

Stack, data and viva angle

Stack: PyMuPDF, an LLM API or local model, React
Data: your own syllabus PDFs
Viva angle: your prompt design, and a teacher's rating of a sample of questions.

What web and mobile app projects stand out?

TOPIC IDEA · INTERMEDIATE

Clash-free timetable generator

Build a department timetable from teacher, room and lab constraints.

− Stack, data and viva angle

Stack: Google OR-Tools (CP-SAT), Django, React
Data: your department's real constraints
Viva angle: hard against soft constraints, and solve time as the input grows.

TOPIC IDEA · BEGINNER

Canteen pre-order with UPI checkout

Order ahead, pay, and collect with a QR token.

− Stack, data and viva angle

Stack: Node.js or Django, PostgreSQL, Razorpay in test mode
Data: none needed
Viva angle: payment webhooks and the order's states from paid to collected.

TOPIC IDEA · INTERMEDIATE

Live college-bus tracker

The driver's phone shares its location; students see the bus and an arrival estimate.

− Stack, data and viva angle

Stack: Flutter, Firebase Realtime Database, Leaflet with OpenStreetMap
Data: live GPS from the app
Viva angle: update interval against battery life, and the OSM tile usage policy.

TOPIC IDEA · INTERMEDIATE

Offline-first study app

Notes and quizzes that work without internet and sync when back online.

− Stack, data and viva angle

Stack: a progressive web app with service workers and IndexedDB
Data: none needed
Viva angle: what happens when the same note is edited on two devices offline.

TOPIC IDEA · BEGINNER

Clinic token and queue display

Patients take a token online; a screen shows the live queue.

Stack, data and viva angle

Stack: Django or Laravel, WebSockets
Data: none needed
Viva angle: stopping two people from booking the same slot.

TOPIC IDEA · INTERMEDIATE

Bill splitter that reads receipts

Photograph a bill; OCR pulls out the items; split them among friends.

Stack, data and viva angle

Stack: Tesseract OCR, OpenCV, Flutter
Data: your own receipt photos
Viva angle: OCR errors on faded thermal paper, and the correction screen.

TOPIC IDEA · BEGINNER

Alumni mentoring portal

Match students with alumni by skills, with chat and session booking.

Stack, data and viva angle

Stack: MongoDB, Express, React, Node.js, Socket.IO
Data: none needed
Viva angle: the matching logic and role-based access.

Picked an idea?

Send it with your branch and deadline, and we will help you scope it. The consultation is free.

Message before 7 pm for a reply today.

Free consultation →

WhatsApp

Which cybersecurity projects can you build legally and safely?

TOPIC IDEA · ADVANCED

IoT botnet traffic detector

Classify attack types from network-flow features.

Stack, data and viva angle

Stack: pandas, LightGBM, a small dashboard
Data: CICIoT2023 (33 attacks recorded on 105 IoT devices)
Viva angle: per-class recall, and why accuracy misleads on imbalanced data.

TOPIC IDEA · ADVANCED

Malware detector from file features

Classify Windows executables from static features, without running them.

Stack, data and viva angle

Stack: LightGBM, the EMBER feature extractor
Data: EMBER
Viva angle: static against dynamic analysis, and why you never handle live samples.

TOPIC IDEA · INTERMEDIATE

Zero-knowledge password manager

Encrypt in the browser so the server never sees a password.

Stack, data and viva angle

Stack: Web Crypto API (AES-GCM, PBKDF2), Node.js
Data: none needed
Viva angle: key derivation, and what a server breach would expose.

TOPIC IDEA · INTERMEDIATE

Passwordless login with passkeys

Add passkey sign-in to a web app and compare it with OTP login.

Stack, data and viva angle

Stack: WebAuthn, SimpleWebAuthn, Node.js
Data: none needed
Viva angle: why a passkey cannot be phished the way an OTP can.

TOPIC IDEA · INTERMEDIATE

Scan, fix and re-scan a lab web app

Scan a deliberately vulnerable app, fix what you find, and prove the fix.

Stack, data and viva angle

Stack: ZAP, with OWASP Juice Shop as the target
Data: your scan reports
Viva angle: mapping findings to OWASP Top 10 categories. Only scan systems you own.

TOPIC IDEA · INTERMEDIATE

SSH brute-force detector

Parse server logs, flag attacks and block the source in a test VM.

Stack, data and viva angle

Stack: Python, the Drain log parser, Isolation Forest
Data: OpenSSH logs from Loghub
Viva angle: your model against a simple fail2ban rule.

TOPIC IDEA · ADVANCED

Spoofed-voice detector

Tell real speech from synthetic or replayed speech.

Stack, data and viva angle

Stack: PyTorch, spectral features, a light CNN
Data: ASVspoof challenge datasets
Viva angle: equal error rate (EER) in plain words.

When does a blockchain project make sense?

Only when several parties who do not trust each other must share one record. Say so in your first slide; it is the first question you will get.

TOPIC IDEA · INTERMEDIATE

Land-record transfer prototype

Record property transfers as tamper-evident on-chain events.

Stack and viva angle

Stack: Solidity, Hardhat, ethers.js, MetaMask on the Sepolia testnet
Viva angle: gas cost per transfer, and what stays off-chain.

TOPIC IDEA · INTERMEDIATE

Farm-to-shop traceability with QR codes

Each hand-off is recorded; a buyer scans the pack to see its journey.

Stack and viva angle

Stack: Hyperledger Fabric, React
Viva angle: permissioned against public chains.

TOPIC IDEA · ADVANCED

Commit-reveal e-voting

Votes stay hidden until polls close, then are revealed and counted on-chain.

Stack and viva angle

Stack: Solidity, Hardhat tests, Next.js
Viva angle: exactly what is private and what is not.

TOPIC IDEA · INTERMEDIATE

Milestone-based crowdfunding

Funds sit in a contract and are released only when backers approve a milestone.

Stack and viva angle

Stack: Solidity escrow contract, Sepolia, React
Viva angle: reentrancy, and the test that catches it.

TOPIC IDEA · INTERMEDIATE

Event tickets that cannot be copied

Tickets as ERC-721 tokens with a scan-once check at the gate.

Stack and viva angle

Stack: OpenZeppelin contracts, IPFS for metadata, a scanner web app
Viva angle: resale rules written into the contract.

What cloud and DevOps projects can a student team build?

TOPIC IDEA · INTERMEDIATE

CI/CD pipeline with GitOps

Every push is tested, containerised and deployed to Kubernetes automatically.

Stack and viva angle

Stack: GitHub Actions, Docker, kind or minikube, Argo CD
Viva angle: a live commit reaching the cluster, then a rollback.

TOPIC IDEA · BEGINNER

Serverless image pipeline

Upload a photo; cloud functions resize, tag and store it.

Stack and viva angle

Stack: AWS Lambda with S3, or Google Cloud Run
Viva angle: cold starts, and your own measured cost per thousand images.

TOPIC IDEA · ADVANCED

Autoscaling on request rate, not CPU

Scale a microservice on a custom metric and compare it with CPU-based scaling under load.

Stack and viva angle

Stack: Kubernetes Horizontal Pod Autoscaler, Prometheus, k6
Viva angle: latency graphs for both policies.

TOPIC IDEA · INTERMEDIATE

Observability for a student app

Add traces, metrics and logs, then find a slowdown you injected.

Stack and viva angle

Stack: OpenTelemetry, Prometheus, Grafana, Loki
Viva angle: tracing one slow request to the line of code.

TOPIC IDEA · INTERMEDIATE

Infrastructure as code with security checks

Define the cloud setup in Terraform and block insecure settings in CI.

Stack and viva angle

Stack: Terraform, Checkov, GitHub Actions
Viva angle: a pipeline that fails on a public storage bucket.

TOPIC IDEA · ADVANCED

Self-hosted LLM API with quotas

Serve an open model behind an API with keys, rate limits and usage logs.

Stack and viva angle

Stack: Ollama or vLLM, FastAPI, Redis
Viva angle: tokens per second on your hardware, and queueing under load.

Which data science projects use real Indian data?

TOPIC IDEA · BEGINNER

IPL match analytics and win probability

Run rates by phase, player match-ups and a ball-by-ball win-probability line.

Stack, data and viva angle

Stack: pandas, scikit-learn, Plotly Dash
Data: Cricsheet ball-by-ball IPL data
Viva angle: testing win probability on a season the model never saw.

TOPIC IDEA · BEGINNER

A century of Indian rainfall

Trends, drought years and a seasonal outlook by meteorological subdivision.

Stack, data and viva angle

Stack: pandas, statsmodels, Streamlit
Data: IMD rainfall datasets on data.gov.in
Viva angle: whether a trend is significant, with the Mann-Kendall test.

TOPIC IDEA · BEGINNER

UPI growth dashboard

Monthly UPI volume and value with a short-term forecast.

Stack, data and viva angle

Stack: pandas, Prophet, Streamlit
Data: NPCI's published UPI product statistics
Viva angle: festival-season effects and forecast error.

TOPIC IDEA · INTERMEDIATE

Mandi price forecaster

Forecast onion or tomato prices at one market a week ahead.

Stack, data and viva angle

Stack: LightGBM or LSTM, FastAPI
Data: daily mandi prices from Agmarknet
Viva angle: a seasonal naive baseline, and what supply shocks do to the error.

TOPIC IDEA · BEGINNER

Customer segments from shop data

RFM features, K-means segments and a plain-language profile of each.

Stack, data and viva angle

Stack: pandas, scikit-learn, Power BI
Data: UCI Online Retail II
Viva angle: how you chose the number of clusters.

TOPIC IDEA · INTERMEDIATE

Hospital readmission predictor

Predict 30-day readmission for diabetic patients.

Stack, data and viva angle

Stack: scikit-learn, XGBoost, SHAP
Data: UCI Diabetes 130-US Hospitals
Viva angle: cleaning messy codes and missing values.

TOPIC IDEA · INTERMEDIATE

City air-quality forecaster

Forecast tomorrow's AQI for your city from past readings and weather.

Stack, data and viva angle

Stack: pandas, LightGBM, Open-Meteo for weather features
Data: air-quality data published by CPCB
Viva angle: weather features against lagged AQI in the feature importance.

Final year project list: all 53 ideas in one table

Every idea on this page in one place, with its domain, level and main programming language, taken from the stack given with each idea. Select an idea to jump to its full description.

All languages | Python | JavaScript | Java | Other

All levels | Beginner | Intermediate | Advanced

Showing all 53 ideas.

All 53 ideas by level and language

IDEA	LEVEL	LANGUAGE
Heart-disease risk checker that explains itself AI and ML	Beginner	Python
Crop recommender that checks the forecast AI and ML	Beginner	Python
Credit-risk model with a fairness audit AI and ML	Intermediate	Python
Telecom churn predictor with a call list AI and ML	Beginner	Python
Diabetes screener from survey answers AI and ML	Intermediate	Python
Hybrid movie recommender AI and ML	Intermediate	Python
Household electricity forecaster AI and ML	Intermediate	Python
Handwritten Devanagari character reader Vision	Beginner	Python
Traffic-sign recogniser tested on real Indian photos Vision	Beginner	Python
Pothole and crack detector for road videos Vision	Intermediate	Python
Food photo to nutrition estimate Vision	Intermediate	Python
Brain-tumour MRI classifier with heatmaps Vision	Intermediate	Python
Yoga pose coach Vision	Intermediate	Python or JavaScript
Deepfake face detector tested on unseen methods Vision	Advanced	Python
Q&A assistant for India's new criminal laws NLP and GenAI	Advanced	Python

IDEA	LEVEL	LANGUAGE
News summariser for Hindi and Marathi NLP and GenAI	Advanced	Python
Aspect-based review analyser NLP and GenAI	Intermediate	Python
AI-written text detector, stress-tested NLP and GenAI	Intermediate	Python
Ask your college database in English NLP and GenAI	Advanced	Python
Question-paper drafter tagged by Bloom's level NLP and GenAI	Intermediate	Python
Voice form-filler for Hindi and Marathi NLP and GenAI	Intermediate	Python
Clash-free timetable generator Web and mobile	Intermediate	Python
Canteen pre-order with UPI checkout Web and mobile	Beginner	JavaScript or Python
Live college-bus tracker Web and mobile	Intermediate	Dart (Flutter)
Offline-first study app Web and mobile	Intermediate	JavaScript
Clinic token and queue display Web and mobile	Beginner	Python or PHP
Bill splitter that reads receipts Web and mobile	Intermediate	Dart (Flutter)
Alumni mentoring portal Web and mobile	Beginner	JavaScript
IoT botnet traffic detector Security	Advanced	Python
Malware detector from file features Security	Advanced	Python
Zero-knowledge password manager Security	Intermediate	JavaScript
Passwordless login with passkeys Security	Intermediate	JavaScript
Scan, fix and re-scan a lab web app Security	Intermediate	Tool-based (ZAP)

IDEA	LEVEL	LANGUAGE
SSH brute-force detector Security	Intermediate	Python
Spoofed-voice detector Security	Advanced	Python
Land-record transfer prototype Blockchain	Intermediate	Solidity, JavaScript
Farm-to-shop traceability with QR codes Blockchain	Intermediate	Go, JavaScript or Java chaincode
Commit-reveal e-voting Blockchain	Advanced	Solidity, JavaScript
Milestone-based crowdfunding Blockchain	Intermediate	Solidity, JavaScript
Event tickets that cannot be copied Blockchain	Intermediate	Solidity, JavaScript
CI/CD pipeline with GitOps Cloud and DevOps	Intermediate	YAML configuration
Serverless image pipeline Cloud and DevOps	Beginner	Python, JavaScript or Java
Autoscaling on request rate, not CPU Cloud and DevOps	Advanced	YAML configuration
Observability for a student app Cloud and DevOps	Intermediate	Your app's language
Infrastructure as code with security checks Cloud and DevOps	Intermediate	HCL (Terraform)
Self-hosted LLM API with quotas Cloud and DevOps	Advanced	Python
IPL match analytics and win probability Data science	Beginner	Python
A century of Indian rainfall Data science	Beginner	Python
UPI growth dashboard Data science	Beginner	Python
Mandi price forecaster Data science	Intermediate	Python
Customer segments from shop data Data science	Beginner	Python

IDEA	LEVEL	LANGUAGE
Hospital readmission predictor Data science	Intermediate	Python
City air-quality forecaster Data science	Intermediate	Python

All 53 are topic ideas, not delivered projects. The language follows the stack named with each idea; most ideas can be rebuilt in another language if your syllabus asks for one.

Final year project ideas using Python, or in Java?

Most ideas here are Python projects, because the AI, vision, NLP, security-analytics and data science stacks are Python-first. Java is not the first choice for any stack above, but it fits several of them well: build any web idea with Spring Boot in place of Django or Node.js, write the Android version of the bus tracker or bill splitter in Java or Kotlin, write the Hyperledger Fabric chaincode for the traceability idea in Java, or run the serverless image pipeline on AWS Lambda's Java runtime. Tell your guide early if the course requires a particular language.

How big should a mini project be compared with a major project?

A mini project proves one technique works; a major project wraps it in a complete, tested system. Most ideas above can be sized either way, so pick the idea first and the scope second.

One idea at two sizes

IDEA	MINI PROJECT SCOPE	MAJOR PROJECT SCOPE
Pothole detector	Classify road photos as damaged or not	Detect damage in video, geotag it and show it on a map, with mAP on your own clips
Criminal-law Q&A	Keyword search over one act	RAG over three acts with cited sections and a faithfulness score
Canteen pre-order	Menu and order form with an admin view	Payments in test mode, QR pickup, order states and load testing

IDEA	MINI PROJECT SCOPE	MAJOR PROJECT SCOPE
IPL analytics	A dashboard of past seasons	A win-probability model tested on an unseen season
Passkey login	Passkey sign-up and sign-in on one page	Passkeys, account recovery and a comparison with OTP login

Sizes are suggestions. For timelines, reports and reviews, see mini and major projects compared.

What makes a final year project viva-friendly?

- **A baseline.** Compare your method with something simpler on the same data, even a rule of thumb.
- **One number you can explain.** Know why you chose F1, mAP, EER or latency, not just its value.
- **A failure case.** Show one input where the system is wrong and say why.
- **A backup demo.** Record a screen video in case the Wi-Fi, GPU session or API key fails on the day.
- **Your data's story.** Where it came from, its licence, and how you split training and test data.

Your report should follow the same logic: problem, related work, method, results against the baseline, limits. See project report and PPT help for chapter structure, or IEEE projects if your guide wants you to start from a published base paper.

Follow your college's academic rules

Our help is building, writing support, guidance and explanation. Understand every part of your project, cite datasets and papers, and check what your university allows.

For AI in more depth, with a level, a dataset, a metric and a research extension for each idea, see machine learning projects for final year. For IoT and other branches, browse all our final year project ideas, sorted by branch. If you would rather have the idea built with you, see final year projects for CSE and IT.

Frequently asked questions

Which final year project is best for CSE students in 2026?

The best one is a project your team can finish, demo live and explain line by line. Retrieval-augmented generation, computer vision and security projects are current, but a well-tested beginner machine learning project scores better than an unfinished advanced one.

What are good final year project ideas for IT students?

IT and CSE syllabi overlap heavily, so every idea on this page suits IT students. If your course leans towards applications and systems, start with the web and mobile, cloud and DevOps, cybersecurity and data science sections: the clash-free timetable generator, the canteen pre-order app with UPI checkout, passwordless login with passkeys and the CI/CD pipeline with GitOps are all good fits.

Can I use a Kaggle or UCI dataset for my final year project?

Usually yes, if you cite it and follow its licence. Add something of your own, such as a new test set, a comparison of methods or a deployed app, and check whether your guide wants data you collect yourself. See our Kaggle dataset project ideas for examples.

Do I need a GPU for a deep learning final year project?

Not your own. Free notebook services such as Google Colab and Kaggle Notebooks offer GPU sessions that are usually enough to fine-tune a small pretrained model, and the finished model can often run on a laptop CPU for the demo. Free GPU time is limited, so save checkpoints.

Is a research paper required for a B.Tech final year project?

It depends on your university and guide. Many only need the project report, the PPT and a viva; some encourage a paper. If yours does, write it in the format the target

conference or journal asks for.

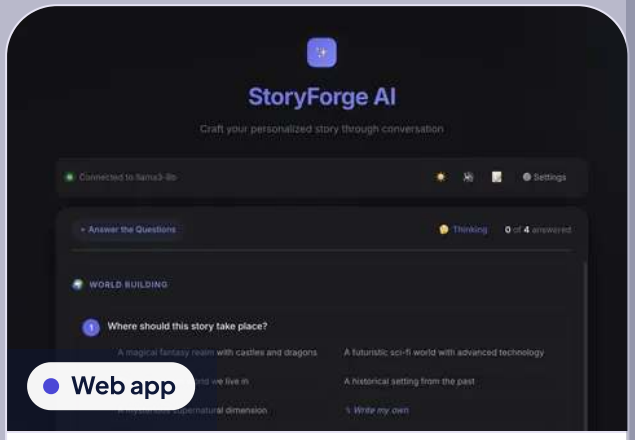
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DELIVERED WORK

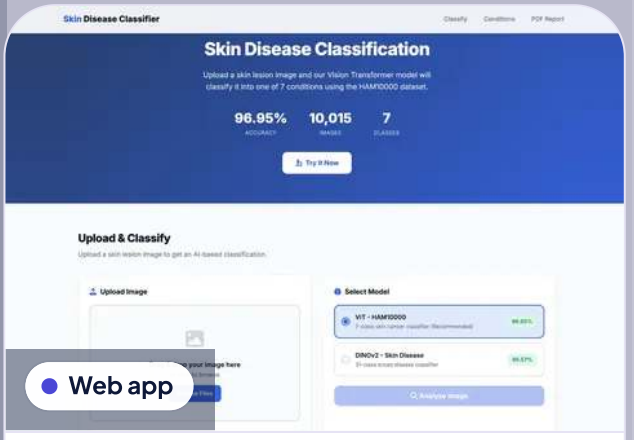
How far these ideas can go

Three delivered M.Tech and M.E. projects in the same domains, shown with names and institute details removed.



M.Tech Generative AI · NLP

Interactive storytelling AI using LLMs



M.Tech Medical imaging · Deep learning

Skin lesion classification using Vision Transformers


5. Dataset, Algorithms and Class Imbalance

AI4I 2020 Predictive Maintenance Dataset — 10,000 records × 14 attributes, 339 failures (3.39 %)

Attribute	Unit / Range	Failure Mode	Count
Type (L / M / H)	6000 / 2997 / 1003	TWF — Tool wear	46
Air temperature	≈ 295 – 305 K	HDF — Heat dissipation	115
Process temperature	≈ 305 – 314 K	PWF — Power	95
Rotational speed	≈ 1168 – 2886 rpm	OSF — Overstrain	98
Torque	≈ 3.8 – 77 N·m	RNF — Random	19
Tool wear	0 – 253 min	Total failures	339

Feature engineering and class imbalance

- Derived features: temperature difference (heat dissipation), torque × angular velocity (power), tool wear × torque (overstrain) — each mirrors a documented failure mechanism.
- 9,661 : 339 ≈ 28.5 : 1 — predicting "no failure" always scores 96.61 % accuracy, detecting nothing.
- SMOTE interpolates synthetic minority samples; RF uses class_weight='balanced'; XGBoost scale_pos_weight ≈ 28.5.

Random Forest

- Bagging — many decorrelated trees in parallel.
- Random feature subset at each split.
- Averaging reduces variance; resistant to overfitting.
- Intrinsic feature-importance measure.

XGBoost

- Boosting — trees built sequentially on residuals.
- $L = \sum l(y_i, \hat{y}_i) + \sum \Omega(f_k)$, $\Omega = \gamma T + \frac{1}{2}\lambda\|w\|^2$.
- Explicit complexity penalty reduces bias safely.

[See all 8 case studies →]

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