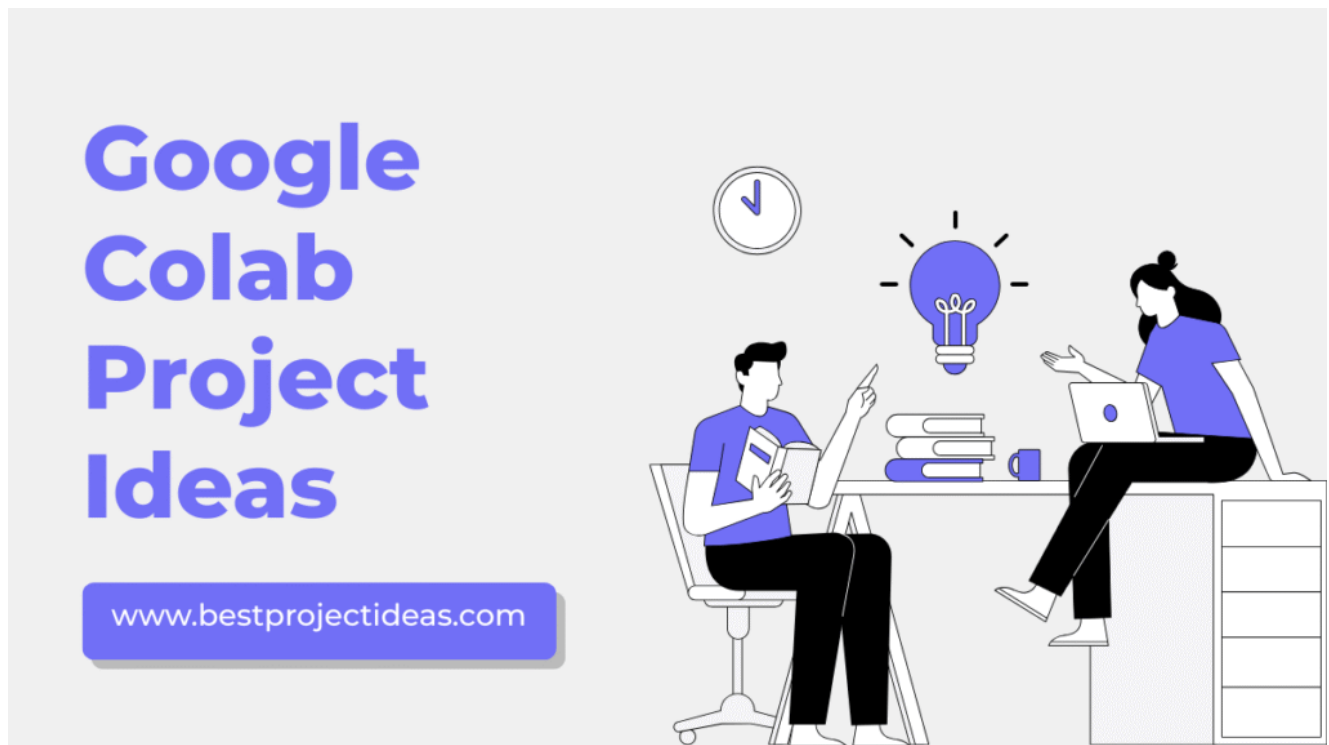


98+ Google Colab Project Ideas 2026

OCTOBER 30, 2025 | JOHN DEAR



Google Colab is a free, cloud-hosted Jupyter notebook environment that lets students run Python code in a browser. It provides free CPU, GPU, and TPU access (subject to quotas), easy access to Python libraries, and simple integration with Google Drive and GitHub.

For students, Colab is ideal because you can start coding immediately without installing anything, share notebooks with teachers or classmates, and scale experiments with hardware accelerators.

This article gives you **100 Google Colab project ideas** you can build, learn from, and add to your portfolio. Each idea includes a short description, suggested datasets or tools, tips for using Colab, and an approximate difficulty level so you can pick projects that match your experience.

Before you begin a Colab project, remember a few practical tips:

- Mount Google Drive (from `google.colab import drive; drive.mount('/content/drive')`) to save datasets and results.
- Use `%pip install package` inside the notebook to install any extra libraries.
- Enable GPU/TPU from Runtime → Change runtime type when training models that need acceleration.
- Use GitHub integration to save and version your notebooks (File → Save a copy in GitHub).
- Break tasks into cells: data loading, preprocessing, modeling, evaluation, and visualization.
- Add clear markdown cells with headings, explanations, and reproducible steps — this makes your notebook a portfolio piece.

The projects below are organized to cover basics (data analysis, visualization), machine learning, deep learning, NLP, computer vision, time series, web/data engineering, and creative/mini-application ideas. Each entry is student-friendly: clear goal, suggested resources, and Colab-specific hints. Pick one, open a new Colab notebook, and start experimenting — the best learning comes from doing.

Must Read: [150 8D Project Ideas 2025-26](#)

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100 Google Colab Project Ideas

1. **Exploratory Data Analysis (EDA) on a Public Dataset**

Pick a dataset from Kaggle (e.g., Titanic, Iris, or a COVID-19 dataset). Perform cleaning, visualizations, correlation analysis, and a summary report. Use Colab to mount Drive and save plots.

2. **Build a Simple Linear Regression Model**

Use a housing dataset (e.g., Boston or a Kaggle housing set). Demonstrate data splits, model training with `sklearn`, and evaluation metrics (MSE, R^2). Use Colab's CPU or GPU as needed.

3. **Classification with Logistic Regression**

Use the Iris or Breast Cancer Wisconsin dataset to classify labels with logistic regression, confusion matrix, and ROC curve. Show feature scaling with `StandardScaler`.

4. **K-Nearest Neighbors (KNN) Classifier**

Implement KNN on a dataset and visualize decision boundaries for 2D features. Use Colab to plot interactive graphs with `matplotlib` or `plotly`.

5. **Decision Tree from Scratch (and with sklearn)**

Explain the concept, implement a simple decision tree or use `sklearn.tree`. Visualize the tree and compare train/test accuracy in Colab.

6. **Random Forests for Tabular Data**

Train a Random Forest on a multi-feature dataset; show feature importance, hyperparameter tuning with `GridSearchCV`, and save the model to Drive.

7. **Gradient Boosting (XGBoost/LightGBM)**

Build a model using XGBoost or LightGBM for a classification or regression task. Use Colab GPU to speed up training; show SHAP value explanations.

8. **Publish a Notebook to GitHub**

Prepare a polished Colab notebook and use the "Save a copy to GitHub" feature. Show how to add README and badges for reproducibility.

9. **Image Classification with a Pretrained CNN**

Use transfer learning (e.g., MobileNet, ResNet) on a small image dataset. Enable GPU in Colab and show fine-tuning steps and confusion matrix.

10. **Handwritten Digit Recognizer (MNIST)**

Build a model (MLP or CNN) to classify MNIST digits. Use Colab GPU and include visualization of sample predictions and misclassifications.

11. **Fashion-MNIST Image Classifier**

Similar to MNIST but with clothing items. Use data augmentation, show training curves, and save the trained model to Drive.

12. **Binary Image Classifier (Cats vs Dogs)**

Use a small subset of the Cats vs Dogs dataset. Apply data augmentation, transfer learning, and evaluate precision/recall. Use Colab GPU for training.

13. **Object Detection with Pretrained Models**

Use a pre-trained YOLO or TensorFlow Object Detection API to detect objects in images. Show Colab steps for installing the model and running inference.

14. **Real-time Webcam Demo in Colab (via ngrok)**

Create a small demo to stream webcam to a server using ngrok (or local runtime) and run inference on video frames. Note Colab limitations and use hosted solutions.

15. **Image Segmentation with U-Net**

Train a U-Net on a small segmentation dataset (e.g., medical or road segmentation). Use Colab GPU and demonstrate mask overlays on images.

16. **Style Transfer Project**

Implement neural style transfer to combine content and style images. Use Colab GPU; let students experiment with different layers and loss weights.

17. **Face Recognition Pipeline**

Build a pipeline that detects faces (Haar cascades or MTCNN) and recognizes them using embeddings (FaceNet). Save embeddings to Drive for quick lookup.

18. **Emotion Detection from Images**

Train a classifier to detect facial emotions (happy, sad, angry). Use a small emotion dataset and Colab GPU for training and augmentation.

19. **Optical Character Recognition (OCR)**

Use Tesseract or an OCR model to extract text from scanned images or receipts. Show preprocessing steps (thresholding, denoising) in Colab.

20. **Image Captioning (CNN + LSTM)**

Build a model that generates captions for images. Use a small dataset like Flickr8k and train embedding + sequence model on Colab GPU.

21. **Text Classification with Naive Bayes**

Use movie reviews or spam datasets to classify text using TF-IDF and Naive Bayes. Show preprocessing (tokenization, stopword removal) in Colab.

22. **Sentiment Analysis with BERT (Fine-tuning)**

Fine-tune a pre-trained BERT model for sentiment classification using Hugging Face Transformers in Colab with GPU support.

23. **Named Entity Recognition (NER) with spaCy**

Train or use a pre-built spaCy model to perform NER on a news dataset. Show how to visualize entities and save models on Drive.

24. **Question Answering with Transformers**

Use a pre-trained QA model (e.g., `distilbert` or `roberta`) and create a small interactive Colab page where students can ask questions about a passage.

25. **Text Summarization Project**

Implement extractive summarization (TextRank) or fine-tune a transformer-based abstractive summarizer. Demonstrate before/after summaries in Colab.

26. **Language Translation with seq2seq**

Build a simple English-to-French translator using seq2seq or use a pre-trained translation transformer. Show example translations and BLEU scoring.

27. **Topic Modeling with LDA**

Use news articles or Reddit posts to extract topics using LDA. Visualize topics with word clouds and pyLDAvis in Colab.

28. **Chatbot using Rasa or Transformers**

Build a simple FAQ chatbot with Rasa or use a transformer for conversational responses. Host training in Colab and export model.

29. **Speech-to-Text with Pretrained Models**

Use libraries like `whisper` or `SpeechRecognition` to transcribe audio clips. Demonstrate uploading audio to Drive and batch processing in Colab.

30. **Text-to-Speech (TTS) Demo**

Use TTS libraries (e.g., TTS from Coqui or `pyttsx3`) to convert text to audio. Save generated audio files to Drive for playback.

31. **Audio Classification (Environmental Sounds)**

Classify audio clips (e.g., UrbanSound8K) into categories like car horn, dog bark. Show spectrogram generation and CNN training in Colab.

32. **Music Genre Classification**

Use the GTZAN dataset to classify music genres. Extract MFCC features, train models, and show accuracy and confusion matrices.

33. **Recommender System (Collaborative Filtering)**

Create a movie recommender using matrix factorization (SVD) or neighborhood methods on MovieLens. Use Colab to visualize recommendations.

34. **Content-Based Recommendation**

Build a recommender using item features (tags, descriptions). Use cosine similarity and show rank lists for users in Colab.

35. **Hybrid Recommender System**

Combine collaborative and content-based methods. Use MovieLens or a book dataset; compare performance metrics in Colab.

36. **Deploy a Model via Flask on Colab (for demo)**

Create a small Flask app inside Colab and demonstrate inference API endpoints. Use ngrok for external access (not production-ready).

37. **Deploy a TensorFlow SavedModel to Drive**

Train a model, export as SavedModel, and save to Drive. Show how to reload the model in a separate Colab notebook for inference.

38. **Experiment Tracking with MLflow**

Use MLflow in Colab to track experiments, parameters, and metrics. Demonstrate logging and comparing runs.

39. **Hyperparameter Tuning with Optuna**

Integrate Optuna for hyperparameter search on an ML model. Use Colab to run trials and visualize results.

40. **Build a Simple API Client for a Public API**

Use APIs like OpenWeatherMap, NewsAPI, or Spotify to fetch data and analyze it in Colab. Show API authentication best practices.

41. **Web Scraping and Data Collection**

Use requests + BeautifulSoup to scrape public webpages (respecting robots.txt). Save scraped data to Drive and perform EDA.

42. **Data Cleaning Pipeline for Messy CSVs**

Create reusable functions to handle missing values, type conversions, and duplicates. Demonstrate on a messy dataset in Colab.

43. **Data Visualization Dashboard with Plotly**

Build interactive charts and dashboards inside Colab using Plotly and plotly.express. Save static images to Drive or export to HTML.

44. **Time Series Forecasting with ARIMA**

Use historical data (e.g., stock prices) to forecast with ARIMA. Show stationarity tests and forecasting plots in Colab.

45. **LSTM for Time Series Prediction**

Train an LSTM to predict future values of a sequential dataset (e.g., temperature or stock close price). Use Colab GPU for faster training.

46. Anomaly Detection in Time Series

Detect anomalies using statistical methods or autoencoders on sensor or server metrics. Visualize anomalies and thresholds.

47. Stock Price Prediction using Machine Learning

Use features like technical indicators to predict stock movements with ML models. Emphasize caution and that this is an educational project.

48. Cryptocurrency Price Analysis

Analyze cryptocurrency historical data, compute correlations, volatility, and visualize trends in Colab.

49. Build a Portfolio Website Generator in Colab

Use Python to generate a static HTML portfolio from markdown files and host the output on GitHub Pages. Save generated site files to Drive.

50. CSV to SQL Loader Script

Write a Colab notebook that reads CSVs and loads them into SQLite or a cloud SQL instance. Show schema creation and basic queries.

51. Data Pipeline with Airflow (Local Demo)

Demonstrate a simple DAG implementation (locally or simulated) that runs ETL tasks. Use Colab for the logic and explain scheduling.

52. OCR Receipt Parser to CSV

Use OCR to extract fields from receipts and regularize them into CSV format (date, vendor, total). Use Colab for batch processing.

53. Automate Google Drive Backups

Create a Colab script that backs up selected Drive folders to a zipped file or to GitHub periodically (run manually or via scheduler).

54. Build a Simple Game with Pygame in Colab (Headless Demo)

While Colab is not ideal for interactive GUIs, you can run Pygame to render frames and save output as images or GIFs. Use this for game logic demos.

55. Generative Art with Python (PIL + Noise Functions)

Use procedural noise (Perlin), PIL, and numpy to create generative images and save them to Drive from Colab.

56. GAN Basics: Generate Simple Images

Train a small Generative Adversarial Network on a 28×28 dataset to create basic images. Use Colab GPU and show training stability issues.

57. Deepfake Face Swap Demo (Ethical & Educational)

Implement a safe, ethical demo showing face alignment and morphing with

strict disclaimers. Focus on the technique and ethics; do not deploy harmfully.

58. **Adversarial Example Demonstration**

Create adversarial noise to fool an image classifier and explain how it works. Use Colab to visualize perturbations and robustness tests.

59. **Explainable AI: LIME and SHAP Examples**

Use LIME and SHAP on models to show feature importance and local explanations. Use a tabular dataset and Colab visualizations.

60. **Build a Simple OCR-Based Quiz Grader**

Grade scanned multiple-choice sheets using OCR and answer matching. Use Colab to process batches and generate scores.

61. **Traffic Sign Classifier**

Use the German Traffic Sign dataset to build a multiclass classifier. Train with augmentation and evaluate per-class accuracy in Colab.

62. **Plant Disease Detection**

Train a model to detect leaf diseases using public plant datasets. Show preprocessing, augmentation, and model export to Drive.

63. **Hand Gesture Recognition from Webcam Frames**

Detect and classify hand gestures using Mediapipe or a small CNN. Use saved video frames in Colab for training and demo.

64. **Pose Estimation Visualizer**

Use MediaPipe to estimate human pose joints from images and visualize skeleton overlays. Run inference in Colab on uploaded images.

65. **Satellite Image Analysis**

Work with satellite imagery (e.g., land cover classification). Show how to handle large data, tiling, and basic segmentation in Colab.

66. **Geospatial Data Visualization with Folium**

Load geospatial datasets and create interactive maps in Colab using `folium`. Save map HTML files to Drive.

67. **Build a Simple ETL Notebook for CSV Data**

Create a reproducible ETL process: extract from web/Drive, transform (clean/normalize), and load to CSV/SQLite. Document steps in Colab.

68. **Automated Email Report Generator**

Create a Colab notebook that generates PDF/HTML reports and sends them via SMTP (with secure credentials) — useful for class assignments.

69. OCR + NLP: Extract Insights from PDFs

Extract text from PDFs with OCR and run topic modeling or summarization on the extracted text inside Colab.

70. Dataset Augmentation Toolkit

Build a set of functions to augment images, audio, or text (synonym replacement). Show before/after samples in Colab.

71. Handwritten Equation Solver

Use OCR and symbolic math libraries to parse and solve handwritten or scanned equations. Demonstrate parsing and result steps.

72. License Plate Recognition System

Detect license plates in images and run OCR. Use Colab for training detection and OCR steps; discuss legal/ethical considerations.

73. Personal Expense Tracker with Visuals

Upload monthly expense CSVs to Colab, analyze categories, generate charts, and export monthly reports to Drive.

74. Resume Parsing and Scoring

Build a tool to parse uploaded resumes and score them against a job description using NLP similarity metrics in Colab.

75. Automated Slides from Notebook

Convert a Colab notebook into presentation slides programmatically (use nbconvert) and customize styles for a class presentation.

76. Algorithm Visualizer (Sorting, Graphs)

Write code to animate algorithms (bubble sort, Dijkstra). Save animation frames as GIFs using Colab.

77. Graph Neural Network (GNN) for Node Classification

Use PyTorch Geometric or DGL to build a small GNN on citation networks (Cora). Use Colab GPU to train and visualize embeddings.

78. Build a Simple Blockchain Simulator

Implement blockchain primitives in Python and simulate mining, transactions, and consensus. Use Colab to run experiments and visualize chains.

79. Portfolio Optimization (Modern Portfolio Theory)

Use historical returns to compute efficient frontier, Sharpe ratios, and optimize weights. Visualize in Colab.

80. Monte Carlo Simulation for Risk Analysis

Simulate scenarios (stock returns, project costs) with Monte Carlo sampling

and show percentiles and confidence intervals.

81. **Create a Simple CLI Tool Packaged in Colab**

Write utility scripts, package them, and show how to install via pip locally or run from Colab for demonstration.

82. **Data Labeling Tool Demo**

Build a minimal labeling interface using IPython widgets or Streamlit (hosted externally) to label images/text and save labels to Drive.

83. **Interactive Widgets for Learning Concepts**

Create IPython widgets to visualize math concepts (Fourier series, derivatives) with sliders and real-time plots inside Colab.

84. **Build a Simple Recommendation Chatbot**

Combine a small conversational flow with a recommender backend in Colab; demo recommending movies or recipes interactively.

85. **Image-Based Product Search (Similarity Search)**

Extract image embeddings with a pre-trained model and perform similarity search for product images. Use Faiss (CPU or GPU) in Colab.

86. **Implement K-Means Clustering and Visualize**

Cluster a dataset and visualize clusters with PCA or t-SNE. Show inertia plots and how to choose k using the elbow method.

87. **Dimensionality Reduction with t-SNE and UMAP**

Apply t-SNE and UMAP on high-dimensional data (embeddings) and visualize clusters. Save plots to Drive.

88. **Build a Small Data Label Quality Checker**

Write scripts to find inconsistent labels, duplicates, and outliers in annotation files. Use Colab to run checks and output reports.

89. **Automated Data Profiling Report Generator**

Use libraries like `pandas-profiling` to generate full dataset reports and export them as HTML files saved to Drive.

90. **Build a Simple Image Search Engine**

Index images using embeddings and create a notebook that returns top-k similar images for a query image. Use Colab to host search logic.

91. **Create a Study Planner using Python**

Let students upload schedule preferences and generate a weekly study plan with priorities and break suggestions. Export as PDF.

92. **OCR for Handwritten Notes to Searchable Text**

Convert photographed lecture notes into searchable text and index them for

quick lookup. Use Colab for batch OCR processing.

93. **Create an Interactive Quiz from a CSV**

Read question bank CSV and generate an interactive quiz using IPython widgets. Track scores and save results to Drive.

94. **Build a Plagiarism Detection Demo**

Use similarity metrics, shingling, or embeddings to compare documents and flag probable plagiarism. Demonstrate on sample essays.

95. **Create a Data Anonymization Script**

Mask personal identifiers in a dataset (names, emails) using regex and replacement strategies. Demonstrate before/after in Colab.

96. **OCR + Table Extraction from PDFs**

Extract tabular data from PDFs and convert into cleaned CSVs. Use libraries like `tabula-py` or `camelot` in Colab.

97. **Run Basic Bioinformatics Pipeline (Sequence Analysis)**

Use Biopython to fetch sequences, compute alignment scores, and visualize motifs. Run small examples inside Colab.

98. **Create a Simple Recommendation Email Generator**

Combine a recommender with a templating engine to generate personalized email suggestions. Use Colab to test batches and save outputs.

99. **Build a Simple Data Annotation Quality Dashboard**

Aggregate labeling metrics (consensus, time per label) and visualize quality indicators to monitor annotators. Use Colab charts.

100. **End-to-End Mini ML Product Demo**

Combine data collection, model training, evaluation, and a small demo API (Flask/ngrok). Package everything in a single Colab notebook and present results with README.

How to choose the right project

1. **Match your skill level**

- Beginner: Start with EDA, simple regression/classification, and visualization projects (ideas 1–10, 21).
- Intermediate: Try deep learning basics, NLP tasks, or time series (ideas 11–26, 44–46).
- Advanced: Work on deployment, GNNs, GANs, and integrated pipelines (ideas 36–39, 56–57, 77, 100).

2. **Keep scope manageable**

Choose one clear deliverable (e.g., “build and evaluate a model” or “create an interactive demo”) and limit dataset size so you can finish in Colab’s runtime limits.

3. **Use reproducible steps**

Write code so another student can run your notebook start-to-finish: include version installs, dataset download, and mount instructions.

4. **Document thoroughly**

Use markdown cells to explain problem statements, methodology, and results. A clean, well-documented notebook is a strong portfolio item.

5. **Leverage Colab features**

Use Drive for storage, GitHub for version control, and GPU/TPU for heavy training. Save models and outputs for later reuse.

6. **Prioritize learning outcomes**

Focus on one skill per project (data cleaning, model selection, hyperparameter tuning, visualization, or deployment) rather than trying to do everything.

Practical notebook checklist

- Title and short description of the project
- Dataset source and download instructions
- Environment setup (`%pip install` and imports)
- Mount Drive and explain file paths
- Exploratory Data Analysis with visuals and key statistics
- Data preprocessing steps with code comments
- Model training and clear evaluation metrics
- Plots for training curves and prediction examples
- Export/save model and artifacts to Drive
- Short conclusion and possible improvements
- Link to GitHub (if published) and instructions to reproduce

Must Read: [Data Centre Project Ideas — 150 Practical, Student-Friendly Projects](#)

Outro

These **100 Google Colab project ideas** are designed to give students practical, hands-on experience across many domains: machine learning, deep learning, NLP, computer vision, data engineering, and creative coding.

Start with simpler projects and gradually move to more complex ones as your confidence grows.

Use Colab's strengths—easy setup, free hardware, and Drive integration—to experiment quickly and share your work with classmates or teachers.

When you finish a project, polish the notebook: add clear markdown explanations, visualizations, and a README. Save the notebook to GitHub and Drive, and consider writing a short blog post about what you learned. Projects are the best way to demonstrate skills to future employers or to strengthen your understanding for exams and coursework.

Pick one idea from the list, open a new Google Colab notebook, and begin — one small experiment per day builds great skills over time. If you want, tell me your current skill level and interests (NLP, CV, data science, etc.), and I'll recommend 3 projects from this list to start with and provide a step-by-step plan for the first one.

 **Blog, Project Ideas**



JOHN DEAR

I am a creative professional with over 5 years of experience in coming up with project ideas. I'm great at brainstorming, doing market research, and analyzing what's possible to develop innovative and impactful projects. I also excel in collaborating with teams, managing project timelines, and

ensuring that every idea turns into a successful outcome. Let's work together to make your next project a success!



[100 Law Project Ideas 2026 — Detailed Topics for Students](#)

Best Project Ideas

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