1. Implement Logistic Regression or Decision Tree *without using scikit-learn*. Show how the pruning works in the case of DT and Random forest algorithms.
2. Implement JPEG standards for image compression with DCT / Huffman coding/decoding of image files. Repeat the process for text files.
3. Generate a text file of 250 words. Given a large text file, count word frequencies and output the top 20 most common words, ignoring stop words.
4. Write a recursive program to compute the fractal dimensions of any shape and plot/display the Sierpinski Triangle.
5. Write a program to end-to-end pre-process the image>>>Noise filter, Contrast Enhancement>>>Image Sharpening>>>Object Detection>>>>ROI segmentation.
6. Write a program to identify the arrhythmia using ECG signals, identify the prominent features as markers to arrhythmia.
7. Write a program to identify the arrhythmia using ECG signals and MRI images, identify the prominent features as markers to arrhythmia on both dataset.
8. Implement TIFF standards for image compression with Wavelet coding/decoding of image files. Repeat the process for text files.
9. Write a code for audio compression using MDCT coding/decoding of image files. Repeat the process for text files.
10. Build a linear regression model with gradient descent and stochastic gradient descent models from scratch. Show the comparisons between two. Don't use any library.
11. Write a code to change the file format from pdf to word document file. Check the size of input and output files. Show the difference in text appearance quality.
12. Implement the code to see the Feature correlations in Titanic dataset, plot the heatmap, Select the features with highest relevance and show the Passenger class wise distribution using only selected features.
13. Create a real-time data visualization dashboard using seaborn or plotly check the attendance as the function of festivals/social gathering.
14. Write a code from scratch to implement k-means and principal component analysis based data clustering on a titanic dataset using any two desired parameters.
15. Implement a bag of words representation based text and speech sentiment analyzer.
16. Implement a bag of word representation to predict the weather day-wise for 10 days and time-wise Air quality difference for each day.

17. Implement a traffic safety system with two wheeler and four wheeler lane, signals, and congestion metrics.

18. Implement an ADAS system for your car. Customize the portfolio of ADAS as per your requirement. Show the crash detection notification to the driver.

19. Implement a Home temperature maintenance system. Keep the temperature of kids and elders to 27 degree centigrade and middle age to 22 degree centigrade. Switch off the system if no person is inside the house.

20. Build a multi-user collaborative editor for text files.

21. Use PCA on a hyperspectral dataset and show the dimensionality reduction using the code.

22. Can you create automatic academic calendars for students and staff separately using python? Also add task schedulers and reminders for highest priority tasks.

23. Design a Personal finance tracker including the saving accounts, mutual funds, other sources, stock price prediction system for further investments.

24. Design an automatic attendance taking system for a class of 600. How would you keep a track of proxies and low attendance notifications to students.

25. Implement a biometric system based on face recognition. If face recognition fails due to any technical issues, it should take input as finger impressions.

26. Implement SURF, SIFT and ORB based feature detection and matching techniques in computer vision without using any available modules.

27. Implement the system to detect live faces with certain landmarks (blinking eyes, eyebrows, lips, cheeks, forehead etc) for online beauty and makeup brands.

28. Implement a system for handstroke/signature detection system for a bank. What else do you want to add as a prominent safety feature to customers?

29. Implement a system for perfect mess selection for the students in a campus. Mess can be selected based on different factors such as food menu and choice of veg/non-veg, distance from the hostel, working hours and distance from the department during lecture hours.

30. Design a learning management system where the students and instructor can upload the documents for submissions. If the size of the file exceeds the max limit of file size, the LMS will automatically compress the file, instead of giving any upload error. The file type can be of any document format but the after upload LMS would convert it into pdf.

31. Design an activity tracker to suggest you the song, movie or series based on past history of choices at social media. For physically challenged people, can you implement a captioning system of that media?

32. Can you take any lung cancer data from kaggle website and use transfer learning to classify the cancer vs non-cancer classes. Repeat the process using fine tuning.

33. Implement Histogram and Topology based Image similarity detection tool.

34. Design a deep fake detection system from scratch for forensic tasks.

35. Implement a code for low to high resolution transformation on an image. Show the best algorithm for Super-resolution on remote sensing data.

36. Write a code for implementation of multi-upgradation tasks on an image, image inpainting, image registration, image generation, image stitching, image mosaicing, panoramic view etc.

37. Implement residual CNN network and VGG network for image classification from scratch. Perform the classification task using both the networks on a video depicting anomaly detection system.

38. Perform multiclass classification on titanic dataset based on age; G1=age<15, G2=16-30, G3=31-55, G4=56-80, G5>80. Classify the groups based on other parameters such as survival, gender, passenger's class. Set up the relation between fare and passenger's class/survival status.

39. For a multilane highway, design a monitoring system for vehicle type, their count & respective speed estimation from traffic videos.

40. Build a QR code generation and scanning based attendance system. As the date changes, the new QR code should be generated and the dates on the calendar with holidays should be skipped automatically. Link the Class room no, with the attendance system to set up a reminder to the instructor 5 mins before class.

41. Implement a depth map generation from two cameras. Use optical flow to implement depth estimation about the object. Demonstrate the applications where you can use these concepts.

42. Implement a system to generate and remove the watermarking (visible or invisible) from the document. Show the private doc if watermarking can not be removed. Repeat the process for company logo generation.

43. Design a federated learning system for a hospital to securely share the clinical data.

44. Implement a multimodal AI model using image, text captions and voice commands. Show any two different applications demonstrating the benefits of Mutimodal AI.

45. Create a manless-driving car workflow with features of your choice, few examples are: lane detection, speed control, sign recognition, obstacle detection, indicator management etc.

46. Built an autonomous object segmentation, detection, assistance system for a super market to assist the customers for the products, similar products they are searching for. They can upload their list of required products and assistance can help with the way to those products and shelves.

47. Design an emotion recognition system using video and audio data fusion. Can you create the automatic transcript of that video?

48. Develop a real-time driver drowsiness detection system. Also detect if the drowsiness is because of intoxications or sleepless hours/driving.

49. Develop a multiorgan segmentation pipeline for medical data. Consider the multi-organs as lungs, tumors, brain MRI, abdomen and pelvic etc.

50. Reconstruct a 3D point cloud from multiple 2D images or a volumetric data. Demonstrate the advantages of point cloud over 2D image.