Vision-Aware Smart Assistant – Project Plan with Milestones

# Project Summary

This project integrates real-time object detection using a deep learning model with smart assistant voice interfaces. A YOLOv5 model will run on a local machine to detect objects from a webcam feed, log them with timestamps, summarize them periodically, and respond to user voice queries via Google Assistant or Amazon Alexa using Home Assistant integration.  
This document outlines a breakdown of the project into discrete, testable components, each with its own Proof of Concept (POC) milestone to validate functionality before integration.

# Timeline Overview

|  |  |  |
| --- | --- | --- |
| Week | Dates | Milestones |
| Week 1 | Apr 16 – Apr 21 | POC 1: Object Detection POC 2: Label Logging |
| Week 2 | Apr 22 – Apr 28 | POC 3: Summarizer POC 4: TTS Output |
| Week 3 | Apr 29 – May 5 | POC 5: Push to Home Assistant POC 6: Voice Query Integration |
| Week 4 | May 6 – May 16 | Integrate All Parts Record YouTube Videos Finalize Report & Slides |

# Mini Proofs of Concept (POCs)

## POC 1: Object Detection

Run YOLOv5 or MobileNet on webcam feed. Print detected labels in real-time.

## POC 2: Label Logging

Save detected labels with timestamps to a local JSON file every few seconds.

## POC 3: Summarizer

Aggregate the log file and generate a summary of objects seen in the past hour.

## POC 4: Text-to-Speech Output

Use Python TTS libraries (e.g., pyttsx3) to speak the generated summary aloud.

## POC 5: Home Assistant Sensor Push

Post summary text to Home Assistant via REST API and verify it appears in the dashboard.

## POC 6: Voice Query Integration

Ask Google or Alexa a custom question and receive a response from the Home Assistant sensor.

# Final Deliverables Checklist

* ☐ 1-page summary (DOCX) with YouTube links
* ☐ Full working demo code (YOLOv5, logging, summarization, integration)
* ☐ PowerPoint slides (10–20 slides, white background)
* ☐ MS Word report with reproducibility steps
* ☐ 15-minute YouTube video presentation
* ☐ 2-minute YouTube teaser demo
* ☐ Backup all media/code to cloud before travel (May 8)
* ☐ Prepare a fallback version of the system for offline demo if needed