Project Design Phase-II
Technology Stack (Architecture & Stack)
Intelligent Garbage Classification Using Deep Learning

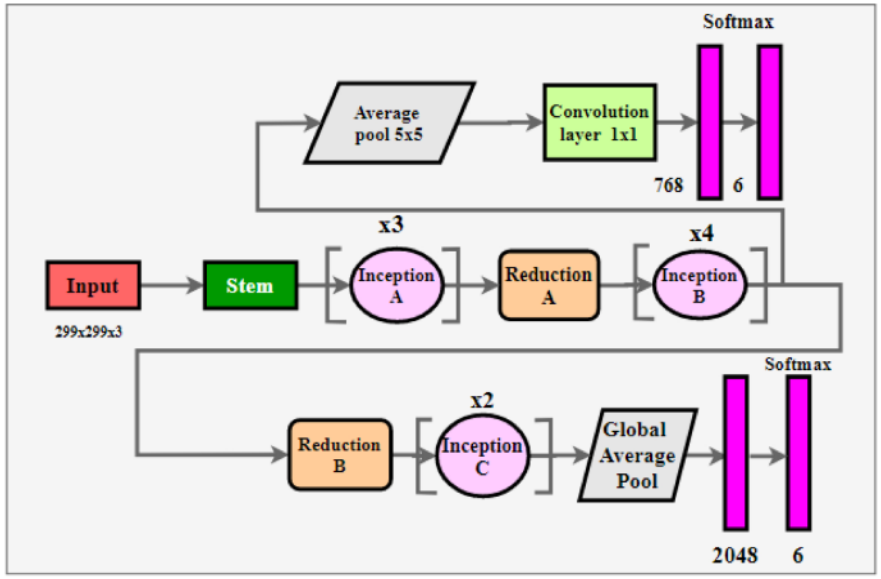
Date	13 May 2023
Team ID	NM2023TMID07370
Project Name	Intelligent Garbage Classification Using Deep Learning
Maximum Marks	4 Marks

Technical Architecture:

In Technical Architecture Smart Dustbin works on the principle of object detection using an ultrasonic sensor. The ultrasonic sensor transmits sound waves. These waves get reflected whenever an object comes into the vicinity of the sensor. This generates an electrical signal which is used to open the dustbin lid.

- Waste implies any unused materials and is rejected as worthless. Waste (also known as rubbish, trash, refuse, garbage, junk) can be unwanted or useless materials.
- Each and every country generates millions of tons of waste every year and this is rapidly increasing every year.
- America is a developed nation, generates 2 kg of municipal solid garbage per day per person, which contributes to 55% of residential waste.
- In addition, developing countries produce 50% of biodegradable waste and the waste generated by the human can be witnessed across the globe.
- For instance, mountains have thousands of pounds of garbage accumulated due to littering and cleaning this garbage in such areas can be tricky.

Example: Order processing during pandemics for offline mode



Guidelines:

- Include all the processes (As an application logic / Technology Block)
- Provide infrastructural demarcation (Local / Cloud)
- Indicate external interfaces (third party API's etc.)
- Indicate Data Storage components / services

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML / Angular Js / React Js etc.
2.	Application Logic-1	Logic for a process in the application	Java / Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson STT service
4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL, NoSQL, etc.
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
10.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Technology of Opensource framework
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	e.g. SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	Technology used
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	Technology used
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	Technology used