Infilect Assignment

The objective of this assignment is to create and deploy an AI pipeline based on the requirements provided below

AI Pipeline application:

This AI pipeline application is a service that serves a simple API request and gives back the response in JSON. The application accepts images in a minimal web interface and the output should be the response containing inference through various AI models present as part of the AI pipeline. The goal is to have an application's latency as minimum as possible and scale it to as many users as possible. Create and save product grouping visualizations on images to files and include in the final solution.

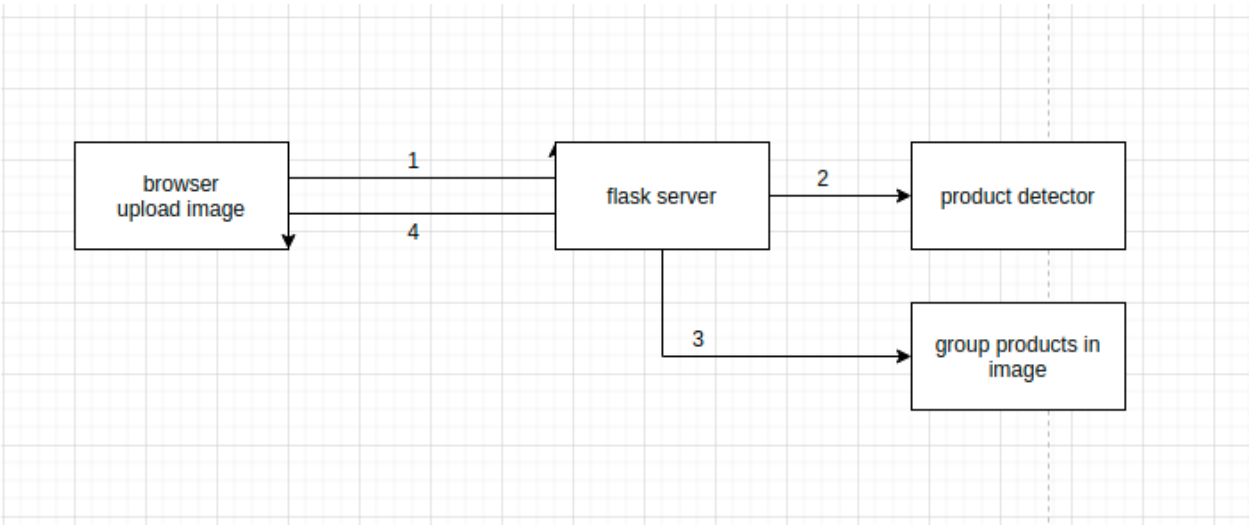
AI Pipeline blocks and its documentation:

1. Flask Webserver
2. Detection Model: Any model of your choice which works well on detecting products in retail shelves and which can run without a lot of compute.
3. Product grouping: Any technique of your choice which groups products that fall under the same brand(huggies, head & shoulders etc. are examples of FMCG brands). Provide a unique id/label for each brand group.
4. Flask, detection and product grouping logic can be built as microservices. Build a pipeline which is scalable.

AI Pipeline Design:

This AI pipeline takes in input as an image in a Flask server. Once the image is downloaded, the flask should send these images for product detection followed by product grouping algorithm/model on all detected objects and returns a json response.

The AI pipeline design and data flow state is defined below.



Note:

1. Hardcoded file paths cannot be used for client-server communication.
2. Images with output visualization is a necessary part of the solution.
3. Include instructions to set up and run the project end to end.

Input Format/Output Format:

Based on the requirements provided above, you can define your input/output json format for this application.

The assignment:

For the assignment, we would like you to do the following:

- Create a Flask server that accepts the input in the given format as above.
- Create microservices/processes for each of the blocks provided in the AI pipeline design block diagram and the documentation provided
- Choose appropriate open source models which work best on given sample images for detection, grouping and visualization. *For product detection, you can make use of open-source models trained on open-source datasets such as Trax SKU-110K, grocery product detection data etc.*

Deliverables:

- A zip file for the working demo containing all relevant scripts along with the project folder and steps to start this project locally.
- The generic input-output format for the application in the documentation. Define appropriate json formats for input(modify if necessary) and output of each block (flask, detector and other blocks)
- A write-up of the end-to-end steps and documentation for this assignment. A detailed explanation of your solution. It may also contain other approaches you think will work for the problem and some comparisons between them.
- Images with output visualizations(boxes: color coded to distinguish)

Note: Kindly do not make your code public on github or any other open source platform.

Expected workflow:

1. Imagine below is an input image for the flask server from client

2. The flask server would send this image to the detector which detects all the objects in the image and groups products. Upon visualization it should look like below

3. The final result from detector + grouping algorithms would have coordinates to all objects from the image and for each object, an id for the unique group is assigned. The response is sent back to the browser as json. Possible display image with visualizations on browser if you have time.

Questions

If you have any questions about the assignment or the project setup or are stuck anywhere, feel free to contact us at raghul@infilect.com and raghu@infilect.com.

Finally, you will present your process, technical decisions, and outcome to us. Looking forward to it!

Good luck with the assignment!