Perishable Produce Evaluation and Discount Recommendation Specification

Overview

This document defines the structure, parameters, rubrics, algorithm, and prompt required to evaluate the perishable state of fruits and vegetables and recommend pricing discounts based on freshness.

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1. Input Parameters

Parameter	Type	Description	Example
`produce_type`	string	Name of the fruit or vegetable	`"Tomato"`
`image_reference`	image / url	Image reference for evaluation	`"image_01.jpg"`
`days_since_harvest`	integer	Days elapsed since harvest	`4`
`storage_condition`	string	Storage environment	`"Room temperature"`
`observations`	string	Human notes or metadata	`"Dull skin, minor blemishes"`

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2. Evaluation Rubric

Each produce item should be rated on the following (010 scale).

Parameter	Description	Indicators	Weight

Colour Brightness and ripeness quality Deep red/orange vs dull 0.2

Firmness Resistance to touch Firm = fresh, Soft = near spoilage 0.3

Surface Condition Scratches, mold, bruises Clean = 10, minor blemish = 7, mold = 0 0.2

Smell/Aroma Fermented or off-smell reduces score Normal = 10, sour = 5 0.1

Expected Shelf Life Remaining Estimated days based on current condition Fresh = 10, Overripe = 3 0.2

Formula:

Freshness Score = (Colour0.2 + Firmness0.3 + Surface0.2 + Smell0.1 + ShelfLife0.2)

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3. Freshness Grading Scale

Grade	Freshness Score	Description	Shelf Life	Retail Label
A	8.510	Fresh and firm	57 days	"Fresh Pick"
B	78.4	Ripe and good	24 days	"Ripe Today"
C	56.9	Softening, dull colour	12 days	"Use Soon"
D	<5	Overripe, damaged	<1 day	"Process Immediately"

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4. Discount Recommendation Table

Grade	Discount (%)	Suggested Use	Buyer Segment
A	010%	Fresh sale	General retail
B	2030%	Cooking / kitchen use	Home consumers
C	3550%	Processing / bulk	Restaurants
D	60%+	Clearance / compost	Waste partners

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5. Algorithm for Evaluation

1. Extract Parameters:

- Read visual and textual input.

- Parse `days_since_harvest`, `storage_condition`, and `observations`.

2. Analyze Image (if provided):

- Detect colour saturation (for ripeness).

- Detect surface blemishes or cracks.

- Estimate firmness (optional with AI vision model).

3. Assign Scores (010):

- Each parameter gets a numeric score using the rubric above.

4. Compute Freshness Score:

Freshness Score = (Colour0.2 + Firmness0.3 + Surface0.2 + Smell0.1 + ShelfLife0.2)

5. Determine Grade and Discount:

- Use Grading Scale table.

- Select discount range from Discount Table.

6. Generate Output JSON:

json

```
{
  "produce_type": "Tomato",
  "freshness_score": 6.8,
  "grade": "C",
  "shelf_life_days_remaining": 2,
  "discount_recommendation": 40,
  "recommended_label": "Use Soon",
  "notes": "Slightly dull, minor blemishes, still usable for cooking."
}
```

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6. Prompt Template for Cursor / OpenAI

You are an AI produce quality inspector and pricing assistant.

Given an image or textual description of a perishable produce item, evaluate its current freshness

and recommend an appropriate discount.

Follow these steps:

1. Evaluate the following parameters: Colour, Firmness, Surface Condition, Smell, and Expected Shelf Life.

2. Assign each parameter a score between 010 using the provided rubric.

3. Compute the Freshness Score using the formula.

4. Determine Grade (AD) and Discount (%) based on grading tables.

5. Provide a brief descriptive summary of your reasoning.

Output strictly in this JSON format:

```
{
  "produce_type": "<produce name>",
  "freshness_score": <calculated score>,
  "grade": "<A/B/C/D>",
  "shelf_life_days_remaining": <integer>,
  "discount_recommendation": <percentage>,
  "recommended_label": "<short label>",
  "notes": "<brief explanation>"
}
```

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7. Example Evaluation

Input	Output Summary
Image: Three dull red tomatoes with minor blemishes	Grade: C, Discount: 3540%, Shelf Life: 2 days, Label: "Use Soon"

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8. Future Enhancements

- Add machine vision scoring for colour and firmness.
- Integrate with temperature logs for predictive shelf life.
- Enable dynamic pricing API link to retail systems.