What is this a picture of ?

A donut (🍩) or a beignet (🥮)?

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Prior work

Prompts

What does a donut look like?

What does a beignet look like?

LLM

Concepts

Hole in center
Glazed surface
dessert

Fried pastry
sugar coating
pastry

Prior work

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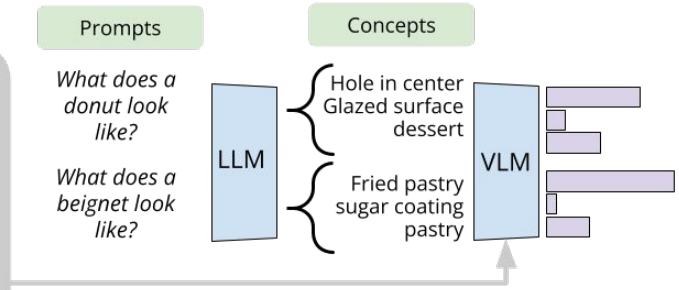

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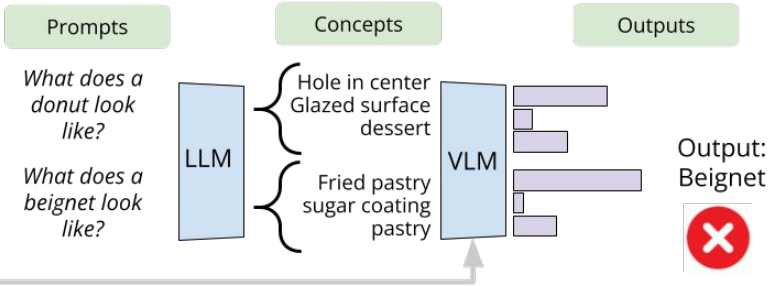

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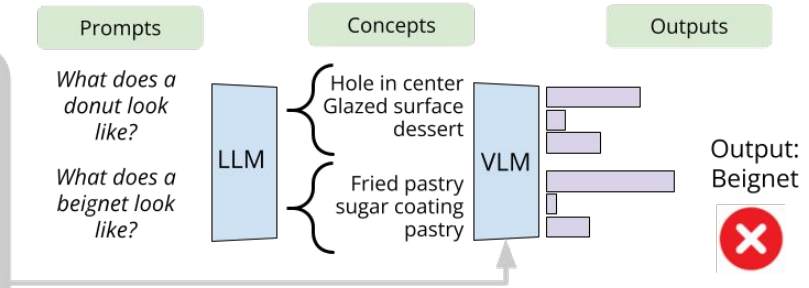

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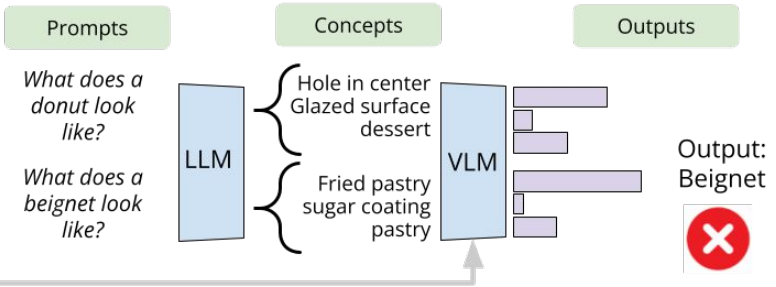

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Concept Library

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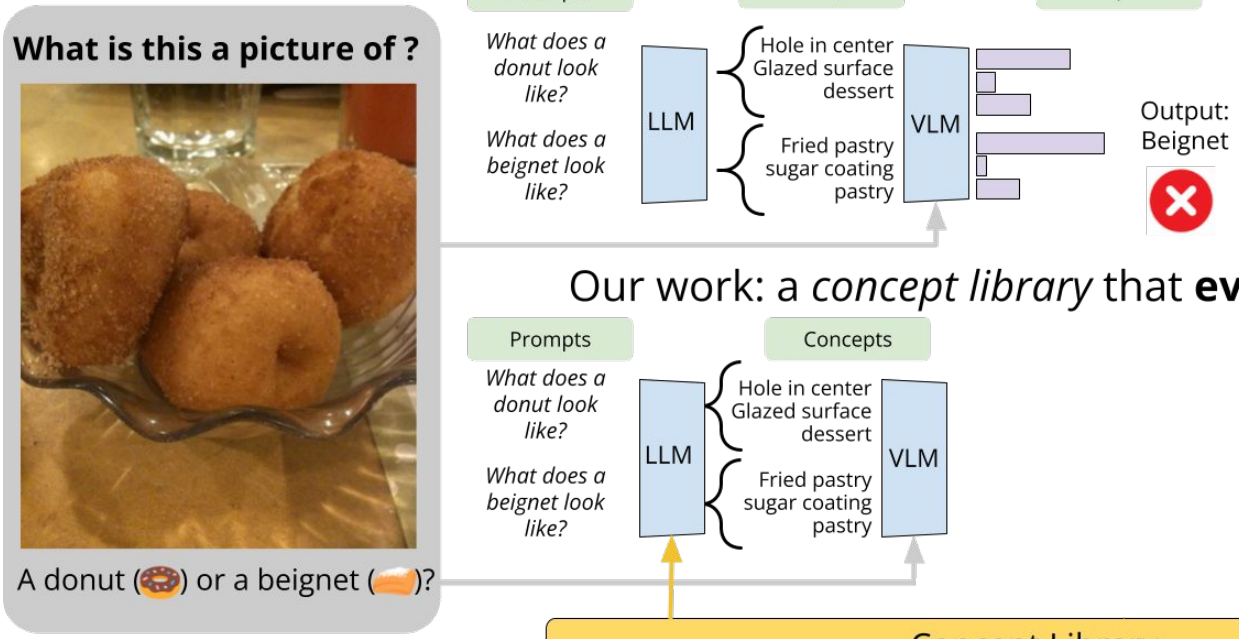

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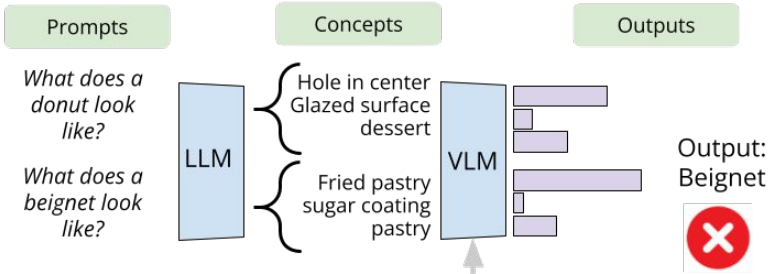

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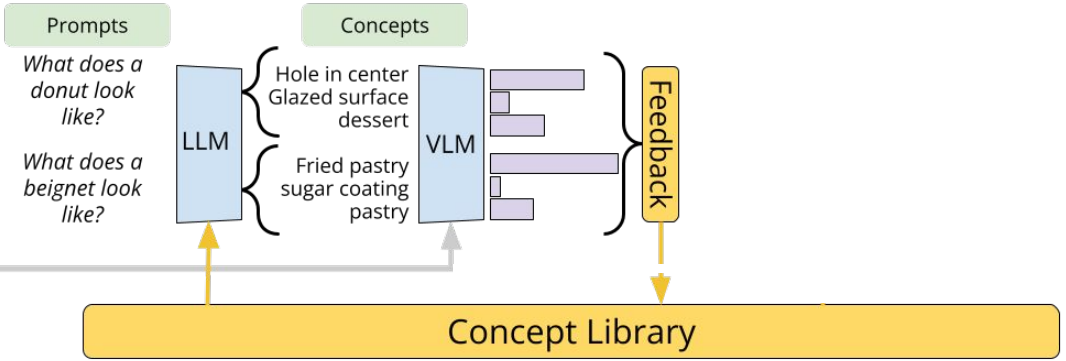
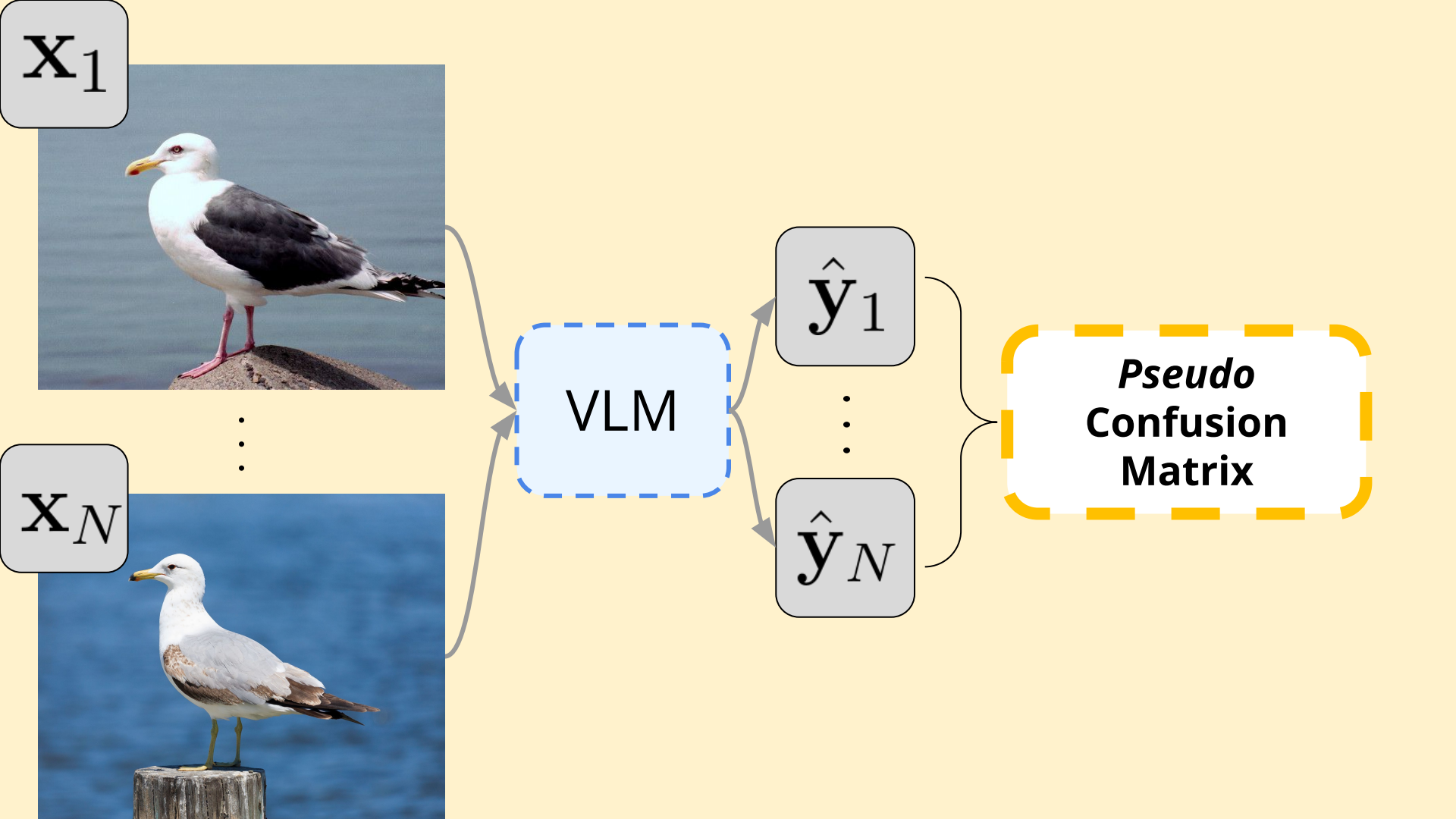
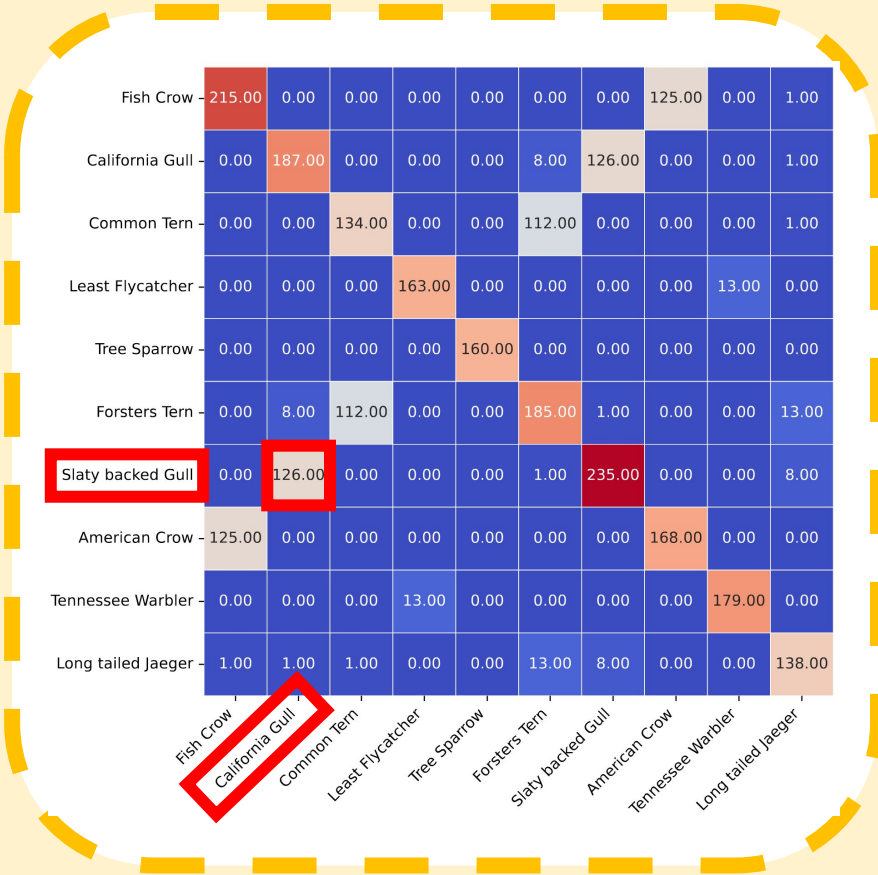



$\mathbf{x}_1$
$\mathbf{x}_N$
VLM
$\hat{\mathbf{y}}_1$
$\hat{\mathbf{y}}_N$
Pseudo Confusion Matrix



Pseudo Confusion Matrix

	Fish Crow	California Gull	Common Tern	Least Flycatcher	Tree Sparrow	Forsters Tern	Slaty backed Gull	American Crow	Tennessee Warbler	Long tailed Jaeger
Fish Crow	215.00	0.00	0.00	0.00	0.00	0.00	0.00	125.00	0.00	1.00
California Gull	0.00	187.00	0.00	0.00	0.00	8.00	126.00	0.00	0.00	1.00
Common Tern	0.00	0.00	134.00	0.00	0.00	112.00	0.00	0.00	0.00	1.00
Least Flycatcher	0.00	0.00	0.00	163.00	0.00	0.00	0.00	0.00	13.00	0.00
Tree Sparrow	0.00	0.00	0.00	0.00	160.00	0.00	0.00	0.00	0.00	0.00
Forsters Tern	0.00	8.00	112.00	0.00	0.00	185.00	1.00	0.00	0.00	13.00
Slaty backed Gull	0.00	126.00	0.00	0.00	0.00	1.00	235.00	0.00	0.00	8.00
American Crow	125.00	0.00	0.00	0.00	0.00	0.00	0.00	168.00	0.00	0.00
Tennessee Warbler	0.00	0.00	0.00	13.00	0.00	0.00	0.00	0.00	179.00	0.00
Long tailed Jaeger	1.00	1.00	1.00	0.00	0.00	13.00	8.00	0.00	0.00	138.00

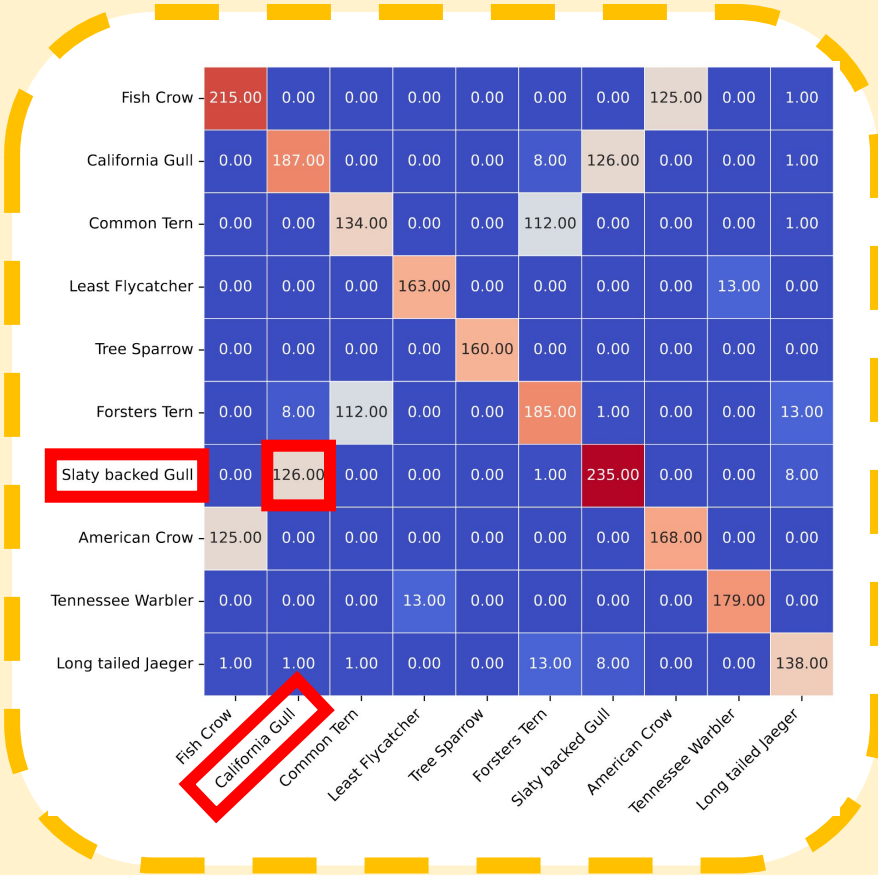
Pseudo Confusion Matrix

Please suggest visual features that distinguish **a slaty backed gull** from **a california gull**.

The current descriptors for **slaty backed gull** are: {cls1_concepts}.
The current descriptors for **california gull** are: {cls2_concepts}.

LLM

```json
{
  "reasoning": [
      "Slaty-backed gulls have a darker, slate-gray back and wings, whereas California gulls have a lighter gray back and wings, making the back coloration a key distinguishing feature.",
      "Slaty-backed gulls exhibit prominent white 'mirrors' on their primary feathers, which are larger and more distinct compared to those of the California gull.", ...
      ],
  "features": [
      "Slate-gray back and wings",
      "Large white mirrors on primary feathers", ...
      ]
}
```



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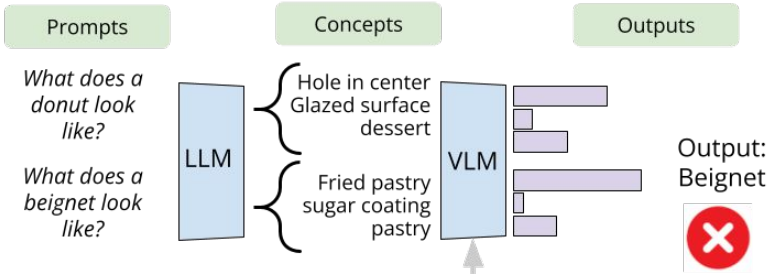

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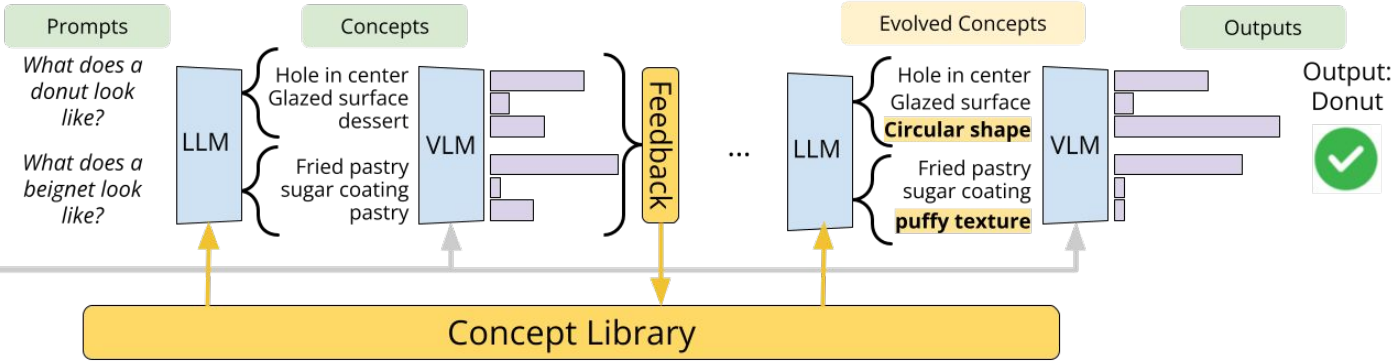

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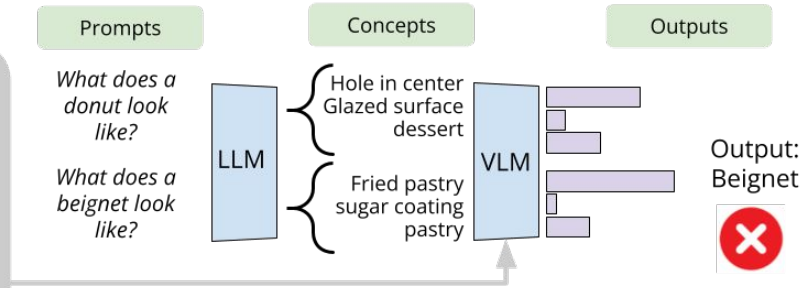

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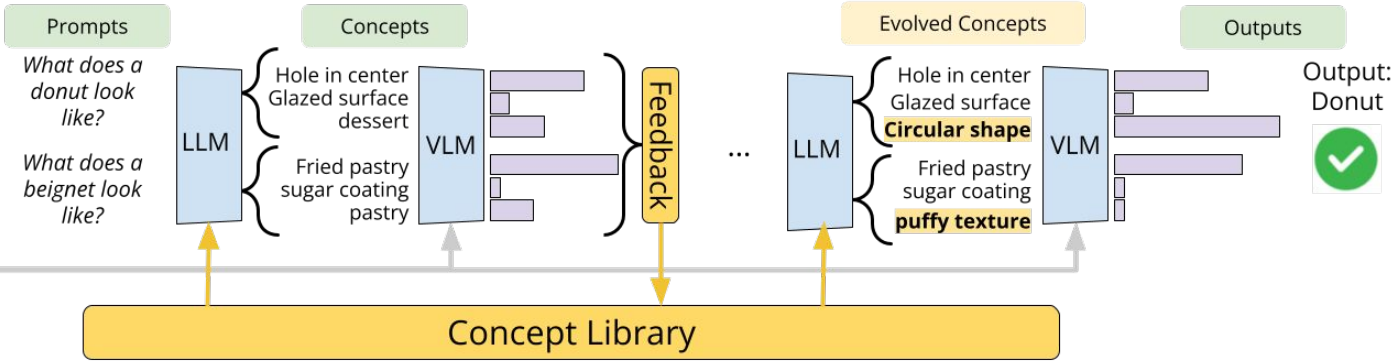

Key insight: The concept library is simultaneously bootstrapping the VLM inputs and the LLM inputs.