GRAIN PALETTE -

A deep learning Odyssey in rice type classification through transfer.

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M Ramadevi
M.Sri Latha
Team Id : LTVIP2025TMID33534

Introduction to Grain Palette

A grain palette refers to a curated selection of grains used in cooking, baking, or brewing to create diverse flavors, textures, and nutritional profiles. Much like an artist’s color palette, a grain palette offers variety and balance, allowing chefs, bakers, and brewers to craft specific culinary or sensory outcomes.

1. Definition

A grain palette is a conceptual or physical collection of different grains, which may include:

Whole grains (e.g., brown rice, quinoa, millet)

Refined grains (e.g., white flour, white rice)

Ancient grains (e.g., farro, spelt, amaranth)

Specialty grains (e.g., black rice, red quinoa, freekeh)

2. Purpose

The grain palette is used for:

Culinary diversity: To enhance taste, texture, and presentation.

Nutritional variety: Different grains offer varying levels of fiber, protein, vitamins, and minerals.

Cultural expression: Grains are integral to regional cuisines (e.g., couscous in North Africa, barley in Northern Europe).

3. Examples in Use

Cooking: A chef may select quinoa, wild rice, and bulgur for a hearty grain bowl.

Baking: A baker might combine wheat, rye, and oats to develop flavor and structure in bread.

Brewing: Brewers often work with a grain palette of barley, wheat, and oats to create different beer styles.

4. Building a Grain Palette

When creating your own palette, consider:

Flavor: Earthy, nutty, sweet, or neutral.

Texture: Chewy, soft, fluffy, or crunchy.

Color: White, red, black, golden, etc.

Cooking time: Some grains take longer to cook than others.

Ideation phase

The Ideation Phase of a grain palette project is where you creatively explore and define the conceptual and visual direction for how grains (like wheat, rice, barley, millet, etc.) will be represented in a design context—whether for branding, packaging, interior design, culinary projects, or agricultural education. Here's a breakdown of how to approach this phase:

1. Define the Purpose and Context

What is the grain palette for?

Branding (e.g., for a bakery or farm)

Product design (e.g., food packaging)

Interior/UX palette (e.g., natural colors/textures)

Educational materials (e.g., infographics, charts)

2. Brainstorm Visual Themes

Consider how to visually represent grains:

Natural elements: husks, kernels, stalks, fields

Colors: muted earth tones, hues, creamy whites, dusty greens

Textures: rough (bran), smooth (polished rice), fibrous (stalks)

3. Explore Color and Material Inspiration

Build a color palette inspired by:

Real grains (e.g., red quinoa, golden oats)

Fields and seasons (e.g., harvest gold, spring green)

Complementary elements (e.g., wooden bowls, stone mills)

4. Create Mood Boards or Concept Clusters

Organize ideas into visual clusters:

Minimalist organic: clean whites and beiges, focus on grain purity

Rustic farmhouse: warm browns, wood, linen textures

Global grain: rich saffron, indigo, deep brown from world cuisines

5. Research Trends and References

Sustainable food branding

Natural/organic product packaging

Grain-focused restaurants or bakeries (e.g., Tartine, Noma)

Agricultural co-ops or grain-focused design systems (e.g., heirloom grain catalogs)

[2]:

```
data_dir = "../input/rice-image-dataset/Rice_Image_Dataset" # Datasets path
data_dir = pathlib.Path(data_dir)
data_dir
```

[2]: PosixPath('../input/rice-image-dataset/Rice_Image_Dataset')

[3]:

```
arborio = list(data_dir.glob('Arborio/*'))[:600]
basmati = list(data_dir.glob('Basmati/*'))[:600]
ipsala = list(data_dir.glob('Ipsala/*'))[:600]
jasmine = list(data_dir.glob('Jasmine/*'))[:600]
karacadag = list(data_dir.glob('Karacadag/*'))[:600]
```

✅ Requirement Analysis of a Grain Palette

The requirement analysis phase defines what the grain palette needs to accomplish, who it's for, and how it will be used. It ensures your design or product development is aligned with the objectives, constraints, and user needs.

HTML CODE USED

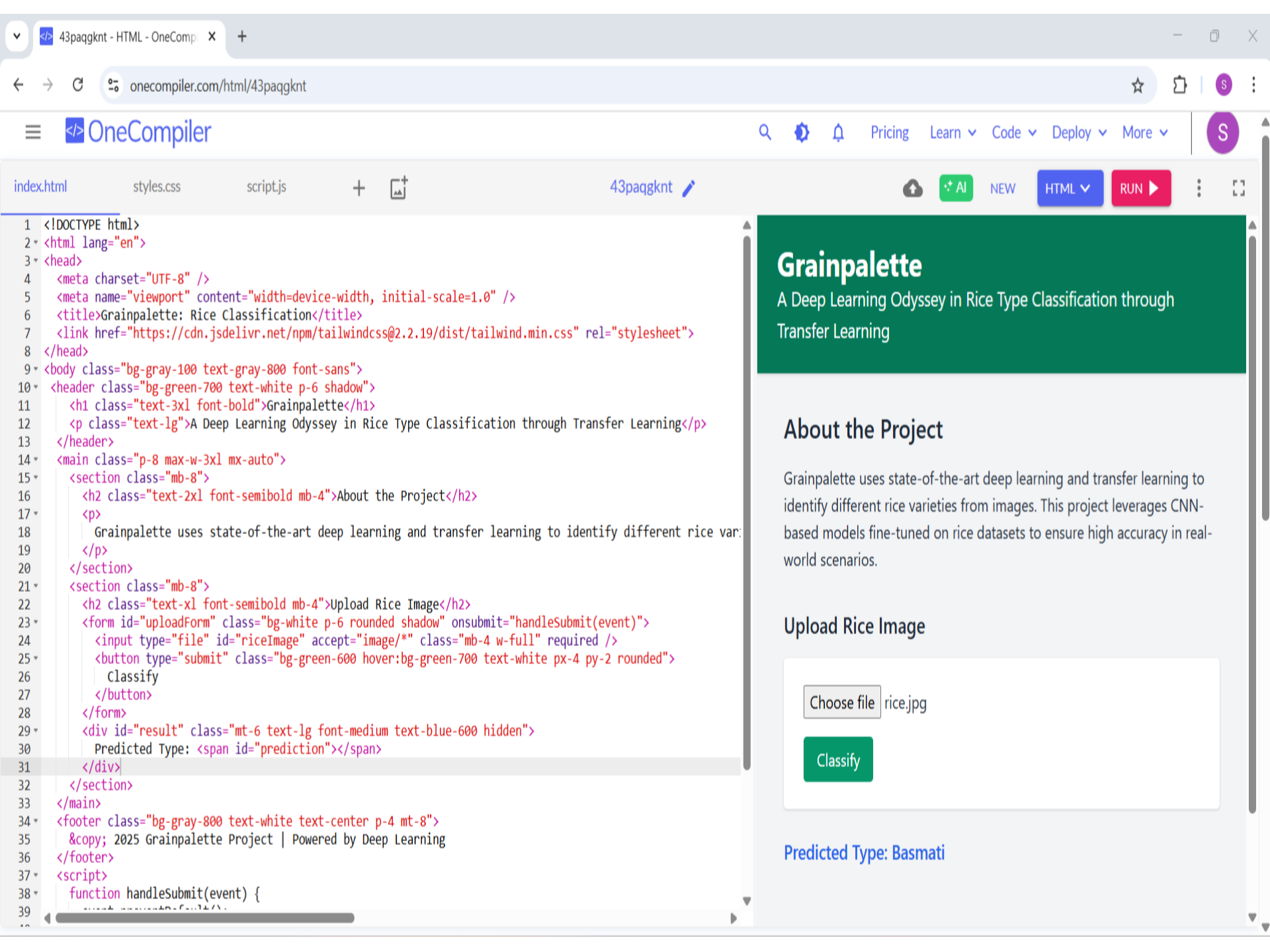
➡ Index.html

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8" />
  <meta name="viewport" content="width=device-width, initial-scale=1.0" />
  <title>Grainpalette: Rice Classification</title>
  <link href="https://cdn.jsdelivr.net/npm/tailwindcss@2.2.19/dist/tailwind.min.css"
rel="stylesheet">
</head>
<body class="bg-gray-100 text-gray-800 font-sans">
<header class="bg-green-700 text-white p-6 shadow">
    <h1 class="text-3xl font-bold">Grain palette</h1>
    <p class="text-lg">A Deep Learning Odyssey in Rice Type Classification through Transfer
Learning</p>
  </header>
<main class="p-8 max-w-3xl mx-auto">
    <section class="mb-8">
      <h2 class="text-2xl font-semibold mb-4">About the Project</h2>
      <p>
```

Grain palette uses state-of-the-art deep learning and transfer learning to identify different rice varieties from images. This project leverages CNN-based models fine-tuned on rice datasets to ensure high accuracy in real-world scenarios.

```
</p>
   </section>
<section class="mb-8">
     <h2 class="text-xl font-semibold mb-4">Upload Rice Image</h2>
     <form id="upload Form" class="bg-white p-6 rounded shadow" on submit="handle
Submit(event)">
       <input type="file" id="rice Image" accept="image/*" class="mb-4 w-full" required />
       <button type="submit" class="bg-green-600 hover:bg-green-700 text-white px-4 py-2
rounded">
         Classify
       </button>
     </form>
     <div id="result" class="mt-6 text-lg font-medium text-blue-600 hidden">
       Predicted Type: <span id="prediction"></span>
     </div>
   </section>
 </main>
<footer class="bg-gray-800 text-white text-center p-4 mt-8">
   &copy; 2025 Grain palette Project | Powered by Deep Learning
 </footer>
```

```
<script>
   function handle Submit(event) {
   event.prevent Default();
     // Mock prediction result for demonstration
     const prediction = "Basmati";
     document.getElementById('result').classList.remove('hidden');
     document.getElementById('prediction').innerText = prediction;
   }
  </script>
</body>
</html>
```


43paqgknt - HTML - OneComp
onecompiler.com/html/43paqgknt
OneCompiler
Pricing
Learn
Code
Deploy
More
index.html
styles.css
script.js
43paqgknt
AI
NEW
HTML
RUN
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26 Classify
27 </button>
28 </form>
29
30 Predicted Type:
31
32 </section>
33 </main>
34 <footer class="bg-gray-800 text-white text-center p-4 mt-8">
35 © 2025 Grainpalette Project | Powered by Deep Learning
36 </footer>
37 <script>
38 function handleSubmit(event) {
39
Grainpalette
A Deep Learning Odyssey in Rice Type Classification through Transfer Learning
About the Project
Grainpalette uses state-of-the-art deep learning and transfer learning to identify different rice varieties from images. This project leverages CNN-based models fine-tuned on rice datasets to ensure high accuracy in real-world scenarios.
Upload Rice Image
Choose file
rice.jpg
Classify
Predicted Type: Basmati

Area	Requirement
Color Scheme	Natural, warm tones reflecting re grain types (e.g., wheat, barley, quinoa, millet, rye, rice)
Material Mapping	Association with textures: coarse (cornmeal), soft (rice flour), smooth (polished grains)
Scalability	Palette should be usable across digital, print, and physical media
Clarity & Contrast	Ensure clear visual distinction between grains (especially in diagrams or UI)
Cultural Representation	Include grains from different regions (e.g., teff from Ethiopia, wild rice from North America)

Requirement	Description
Scalability	Should support growing volumes of grain data and pallets.
Usability	Interface should be intuitive for warehouse operators and managers.
Performance	Real-time updates on inventory and pallet movement.
Reliability	System should not lose data during transfers or updates.
Security	Role-based access to ensure data integrity and confidentiality.