**Example Submission: Investigating and Detecting AI-Generated Images**

**Step 1: Media Type Selection**

Chosen Media Type: **Images**  
Rationale: I selected images because the visual nature of AI-generated media often presents identifiable patterns or artifacts that distinguish it from human-generated images. Exploring these features will provide insights into how AI-generated images differ from real ones.

**Step 2: Collected Examples**

**AI-Generated Images**

1. **Image 1:** Portrait generated by *ThisPersonDoesNotExist* (source: [https://thispersondoesnotexist.com](https://thispersondoesnotexist.com/)).
2. **Image 2:** AI-generated artwork created using Playground AI, depicting a surreal landscape.
3. **Image 3:** AI-generated image of a felt cat made with Chat-GPT

**Human-Generated Images**

1. **Image 4:** Photograph of Abraham Lincoln from the Lincoln Memorial.
2. **Image 5:** Photograph of a crocheted Christmas tree.
3. **Image 6:** A photograph of me running.

All images were saved and renamed appropriately for testing.

**Step 3: Brainstorm Specific Traits with AI**

**Prompt Used**

*"What traits can be analyzed to determine if an image is AI-generated? Consider artifacts, inconsistencies, or other distinguishing characteristics."*

**AI Response**

1. **Symmetry Issues:** AI-generated faces often exhibit unnatural symmetry or asymmetry.
2. **Edge Artifacts:** AI images may have blurry or jagged edges in objects or facial features.
3. **Lighting and Shadows:** Lighting in AI images may be inconsistent or unrealistic.
4. **Background Artifacts:** AI-generated images may include nonsensical or incomplete details in the background.
5. **Color Variance:** AI images sometimes display unnatural color gradients or inconsistencies.

**Traits Selected for Analysis**

1. Symmetry Issues
2. Edge Artifacts
3. Background Artifacts

Rationale: These traits are visually observable and align with known limitations of AI-generated images. They also provide measurable criteria for programmatic analysis.

**Step 5: Program Testing**

| **Image** | **Prediction** | **Actual** | **Correct?** |
| --- | --- | --- | --- |
| Image 1 | AI-generated | AI-generated | Yes |
| Image 2 | AI-generated | AI-generated | Yes |
| Image 3 | AI-generated | AI-generated | Yes |
| Image 4 | Human-generated | Human-generated | Yes |
| Image 5 | Human-generated | Human-generated | Yes |
| Image 6 | Human-generated | Human-generated | Yes |

**Result:** The program correctly identified all six images. The detection based on symmetry, edge artifacts, and background inconsistencies worked effectively.

**Step 6: Reflection Report**

1. **Program Performance:**  
   The program accurately classified all six images. Symmetry detection worked particularly well for portraits, and edge artifact analysis highlighted common issues in AI-generated images like blurred or jagged edges.
2. **Feature Analysis:**
   * **Symmetry Issues:** This was effective for distinguishing AI-generated faces, as AI systems often produce unnatural facial features.
   * **Edge Artifacts:** Detected inconsistencies in object boundaries, particularly in AI-generated art.
   * **Background Artifacts:** Revealed nonsensical or overly smooth background details common in AI-generated images.
3. **Limitations and Improvements:**
   * **Limitations:** The program relied heavily on visible artifacts, which may not appear in high-quality AI-generated images. Background analysis might be less effective for minimalistic or abstract content.
   * **Improvements:** Incorporating additional features like color variance or examining reflections and shadows could improve detection. Training the program on a larger dataset could enhance accuracy for subtle differences.

**Conclusion**

This project deepened my understanding of AI-generated images and detection methods. By analyzing traits such as symmetry, edge artifacts, and background inconsistencies, I gained insight into the challenges of distinguishing AI from human work. While the program performed well, future improvements could address its limitations in detecting more sophisticated AI-generated images.