하은희 기생충 AI 문제 답

2025. 12. 15.

각 조별로 아래 두 문항을 해결하고 각자 최소 하나의 문항을 해결한 답을 각자 notion 에올리시오.

선택 문항: 문항 1 번

- Malaria 감염 RBC 와 비감염 RBC 사진을 Malaria Cell Images Dataset https://www.kaggle.com/datasets/iarunava/cell-images-for-detecting-malaria/data 에서 내려받아, 이미지 분류 CNN 을 설계해 감염비감염 적혈구를 구분하는 모델을 만들고 모델의 성능을 평가한 보고서를 작성하시어 각자 노션에 올리시오.

  참고문헌>https://pmc.ncbi.nlm.nih.gov/articles/PMC12629934/#S2

이 보고서에서 2 가지 버전 ((1) Teachable Machine 그리고 (2) Vibe Coding)을 이용하여 선택 문항 1 번 모델을 만들었습니다.

(1) Teachable Machine 을 활용한 이미지 분류

Image Model - Teachable Machines 를 사용하여 이미지 분류를 실행했습니다.

고급 설정

모델이 얼마나 잘 작동하는지 파악하는 데 도움이 되는 몇 가지 그래프입니다.

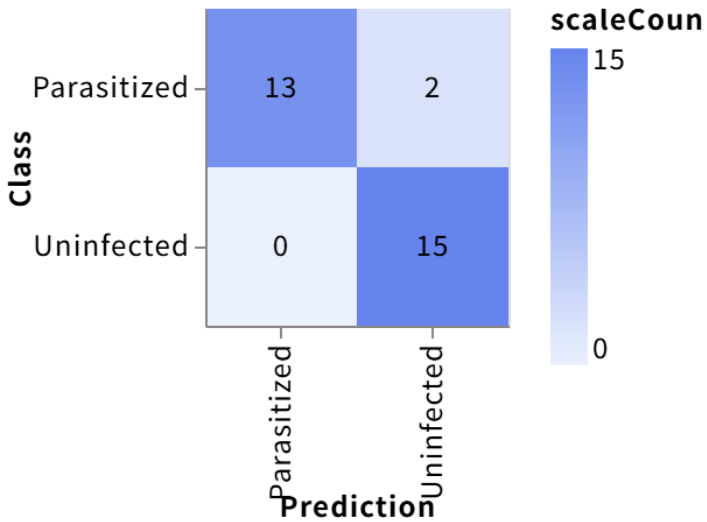
처음에는 이해가 되지 않아도 걱정하지 마세요. Teachable Machine을 사용하는 데는 이 그래프가 필요하지 않습니다. 사실 대부분의 사람들은 그래프를 굳이 사용하지 않습니다. :)

어휘

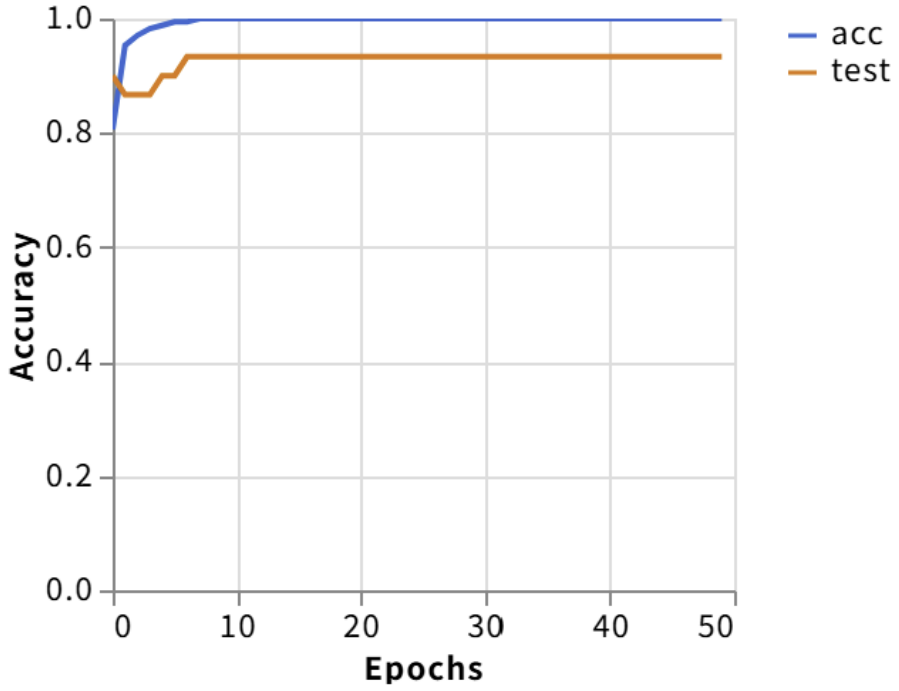
클래스별 정확도

CLASS	ACCURACY	# SAMPLES
Parasitized	0.87	15
Uninfected	1.00	15

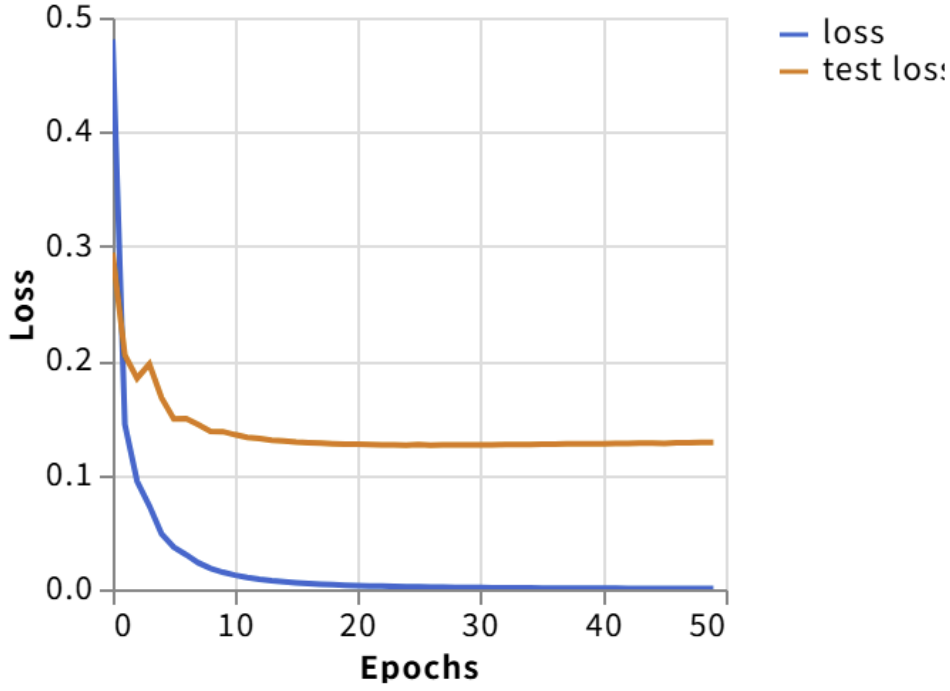
혼동 행렬



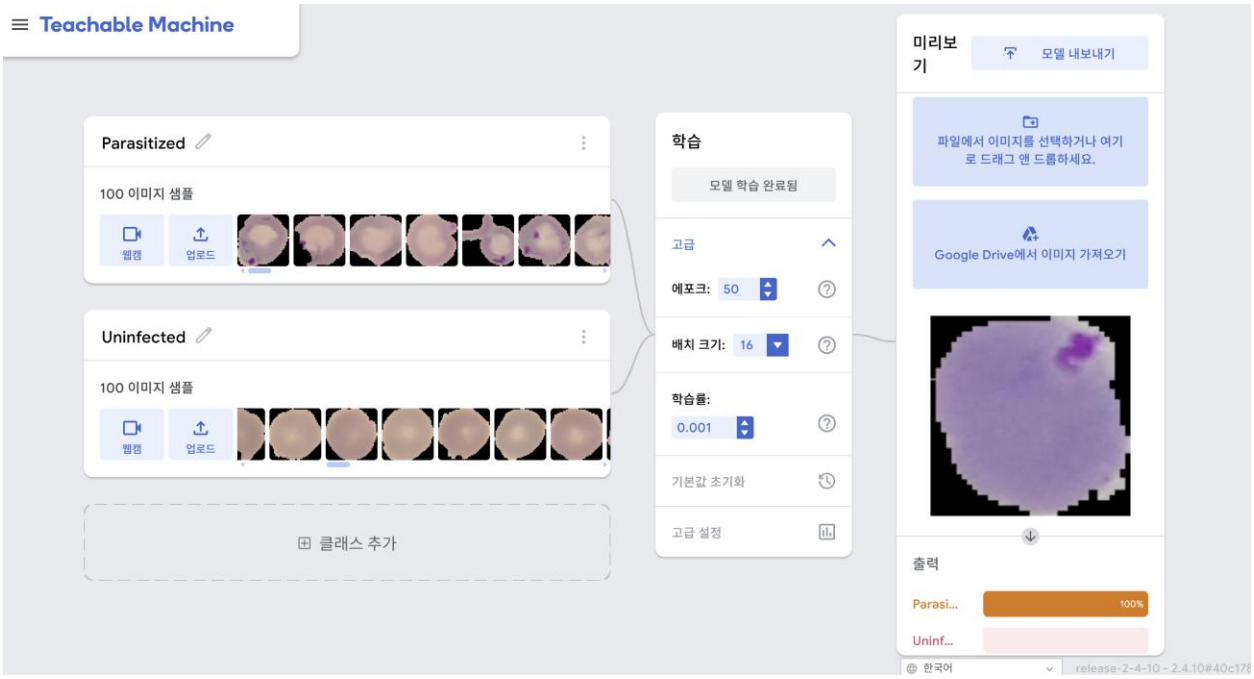
에포크별 정확도



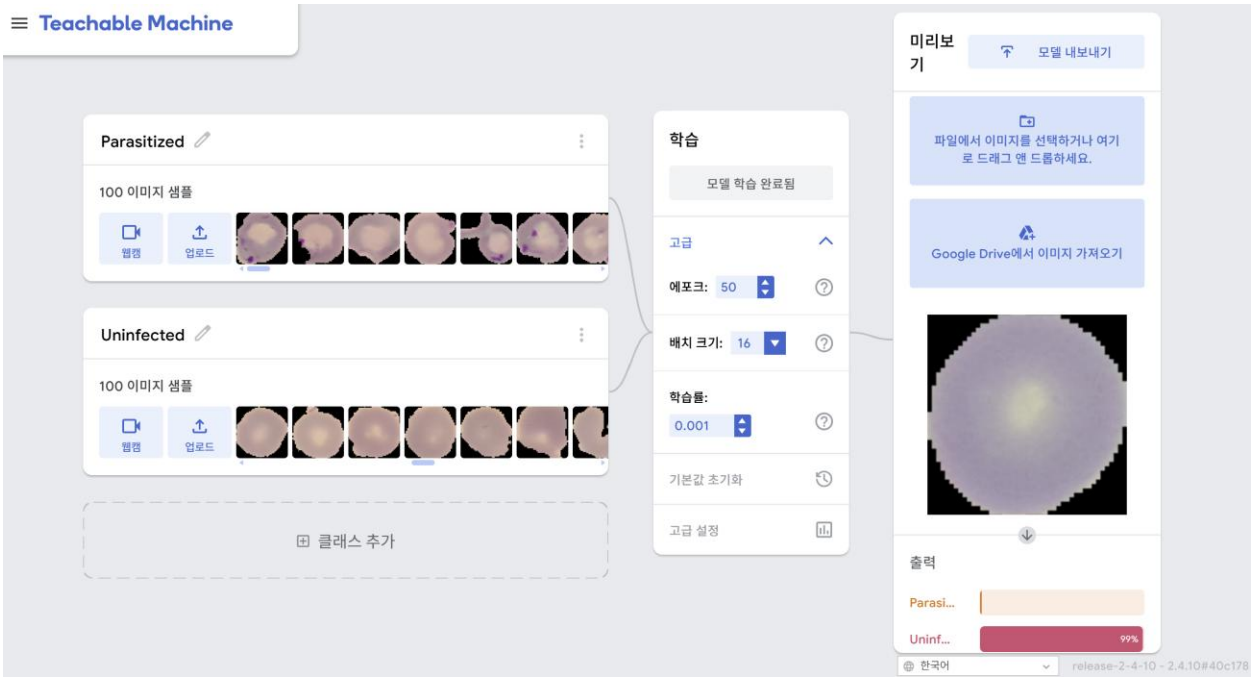
에포크별 손실



Test (Parasitized Test Image)



Test (Uninfected Test Image)



AI Colab Result (모델의 성능을 평가한 보고서)

https://colab.research.google.com/drive/1QgIDN1QipXbNsAywlqb2v2-aadjnvIlz?usp=sharing

사용한 Test Image (test_images.zip)와 모델 (converted_tflite.zip)

test_images.zip

converted_tflite.zip

(2) Vide Coding 을 이용한 분류

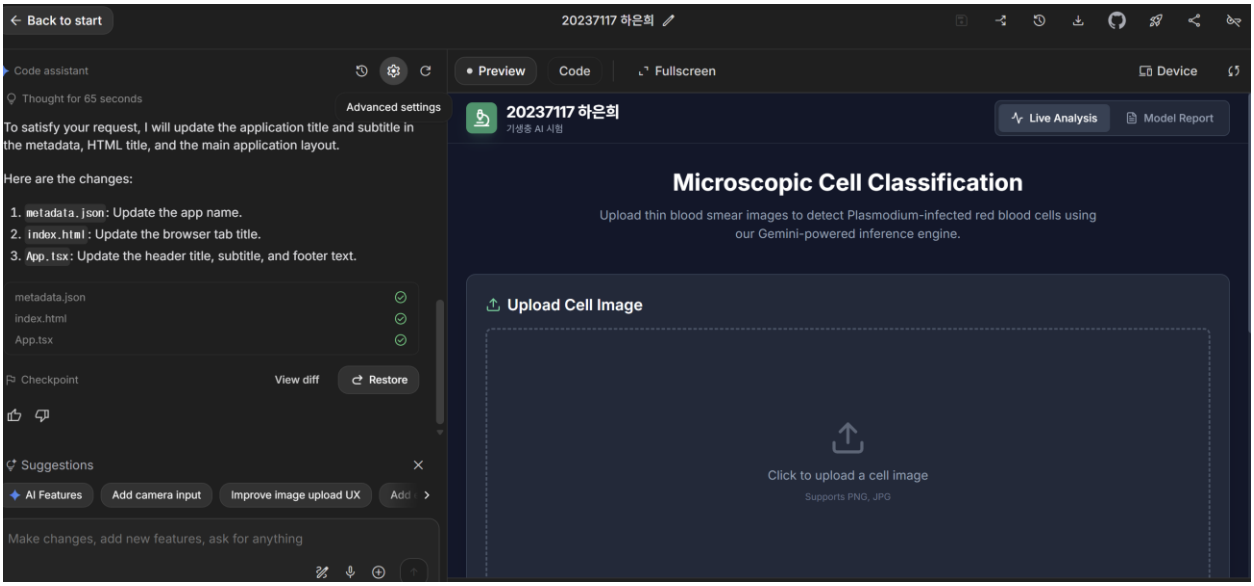
aistudio.google.com 를 활용하여 Parasite 와 uninfected 를 분류하는 모델을 만들었습니다.

User Prompt: "**https://www.kaggle.com/datasets/iarunava/cell-images-for-detecting-malaria/data** 이미지 분류 CNN 을 설계해 감염비감염 적혈구를 구분하는 모델을 만들고 모델의 성능을 평가한 보고서를 작성해줘."

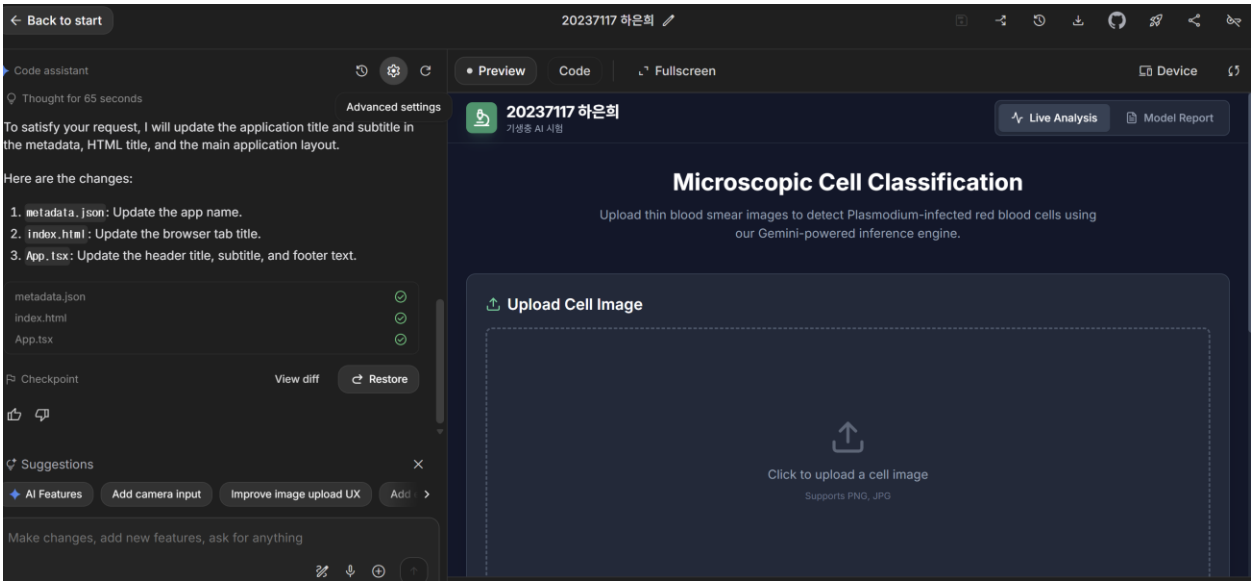
생성모델:

https://ai.studio/apps/drive/1S4y1SMiwQXDSmqUQfpm1w-sLDA7FvuEY?fullscreenApplet=true

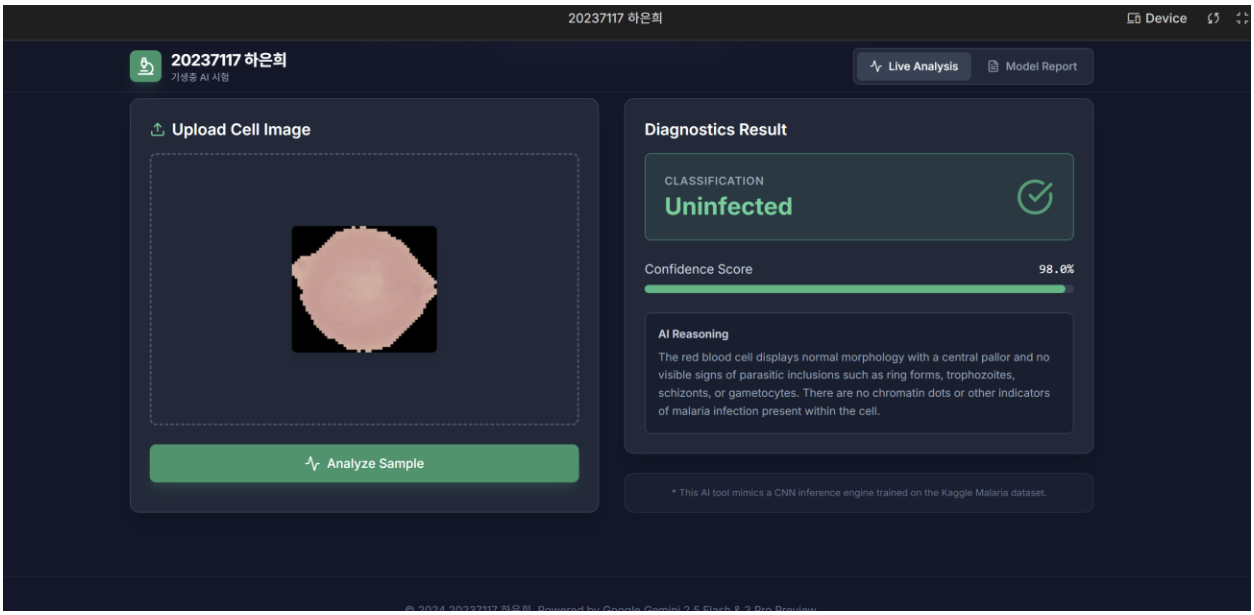
https://aistudio.google.com/app/prompts?state={"ids":["1S4y1SMiwQXDSmqUQfpm1w-sLDA7FvuEY"],"action":"open","userId":"117329364207480471566","resourceKeys":{}}&usp=sharing



Test (Parasite Sample)



Test (Uninfected Sample)



AI Studio Code:

```
import React, { useState } from 'react';
import { AppMode } from './types';
import { ImageAnalyzer } from './components/ImageAnalyzer';
import { ReportGenerator } from './components/ReportGenerator';
import { Microscope, FileText, Activity } from 'lucide-react';


const App: React.FC = () => {
  const [mode, setMode] = useState<AppMode>(AppMode.ANALYSIS);


  return (
    <div className="min-h-screen bg-slate-900 text-slate-200 selection:bg-emerald-500/30 pb-12">
      {/* Header */}
      <header className="bg-slate-900 border-b border-slate-800 sticky top-0 z-50 backdrop-blur-md bg-opacity-80">
        <div className="max-w-7xl mx-auto px-4 sm:px-6 lg:px-8 h-16 flex items-center justify-
```

```
between">
          <div className="flex items-center gap-3">
            <div className="w-10 h-10 bg-emerald-600 rounded-lg flex items-center justify-center shadow-lg shadow-emerald-600/20">
              <Microscope className="text-white w-6 h-6" />
            </div>
            <div>
              <h1 className="text-xl font-bold text-white tracking-tight">20237117 하은희</h1>
              <p className="text-xs text-slate-400">기생충 AI 시험</p>
            </div>
          </div>

          <nav className="flex items-center gap-1 bg-slate-800 p-1 rounded-lg border border-slate-700">
            <button
              onClick={() => setMode(AppMode.ANALYSIS)}
              className={`px-4 py-2 rounded-md text-sm font-medium transition-all flex items-center gap-2 ${
                mode === AppMode.ANALYSIS
                  ? 'bg-slate-700 text-white shadow-sm'
                  : 'text-slate-400 hover:text-slate-200'
              }`}
            >
              <Activity className="w-4 h-4" />
              Live Analysis
            </button>
            <button
```

```
                onClick={() => setMode(AppMode.REPORT)}
                className={`px-4 py-2 rounded-md text-sm font-medium transition-all flex items-center gap-2 ${
                  mode === AppMode.REPORT
                    ? 'bg-slate-700 text-white shadow-sm'
                    : 'text-slate-400 hover:text-slate-200'
                }`}
              >
                <FileText className="w-4 h-4" />
                Model Report
              </button>
            </nav>
          </div>
        </header>

        {/* Main Content */}
        <main className="max-w-7xl mx-auto px-4 sm:px-6 lg:px-8 py-8 animate-fade-in">
          {mode === AppMode.ANALYSIS ? (
            <div className="space-y-6">
              <div className="text-center max-w-2xl mx-auto mb-10">
                <h2 className="text-3xl font-bold text-white mb-3">Microscopic Cell Classification</h2>
                <p className="text-slate-400">
                  Upload thin blood smear images to detect Plasmodium-infected red blood cells using our Gemini-powered inference engine.
                </p>
              </div>
```

```
            <ImageAnalyzer />
          </div>
        ) : (
          <div className="space-y-6">
            <div className="flex items-center justify-between mb-8">
              <div>
                <h2 className="text-3xl font-bold text-white mb-2">CNN Architecture & Performance</h2>
                <p className="text-slate-400">Design, train (simulated), and evaluate custom CNN models on the Malaria Cell Images dataset.</p>
              </div>
              <div className="hidden lg:block text-right">
                <p className="text-xs text-slate-500 uppercase tracking-wider">Dataset Source</p>
                <a href="https://www.kaggle.com/datasets/iarunava/cell-images-for-detecting-malaria" target="_blank" rel="noreferrer" className="text-blue-400 hover:text-blue-300 text-sm font-medium">Kaggle Malaria Dataset ↗</a>
              </div>
            </div>
            <ReportGenerator />
          </div>
        )}
      </main>

      {/* Footer */}
      <footer className="border-t border-slate-800 mt-12 py-8 text-center text-slate-500 text-sm">
        <p>© 2024 20237117 하은희. Powered by Google Gemini 2.5 Flash & 3 Pro Preview.</p>
      </footer>
```

```
        </div>
    );
};

export default App;
```