Sketch Searcher used CNN

Machine learning project (use Python)

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〈Aim of Project〉

- Find object that I want based on vaguely remembered image information

" Remember Easier"

Recognize images
that are hard to remember

〈Project Planning〉

- **Window consists of Paint canvas and Output canvas.**
  (Working in PyCharm environment)
- **Prepare Data Set.** (Sketch Images)
- **Machine Learning.**
  (Working in Jupyter Notebook environment)
- **Apply model that is learned on the window that we previously prepared.**
- **Show picture in which an image means.**

Design Window

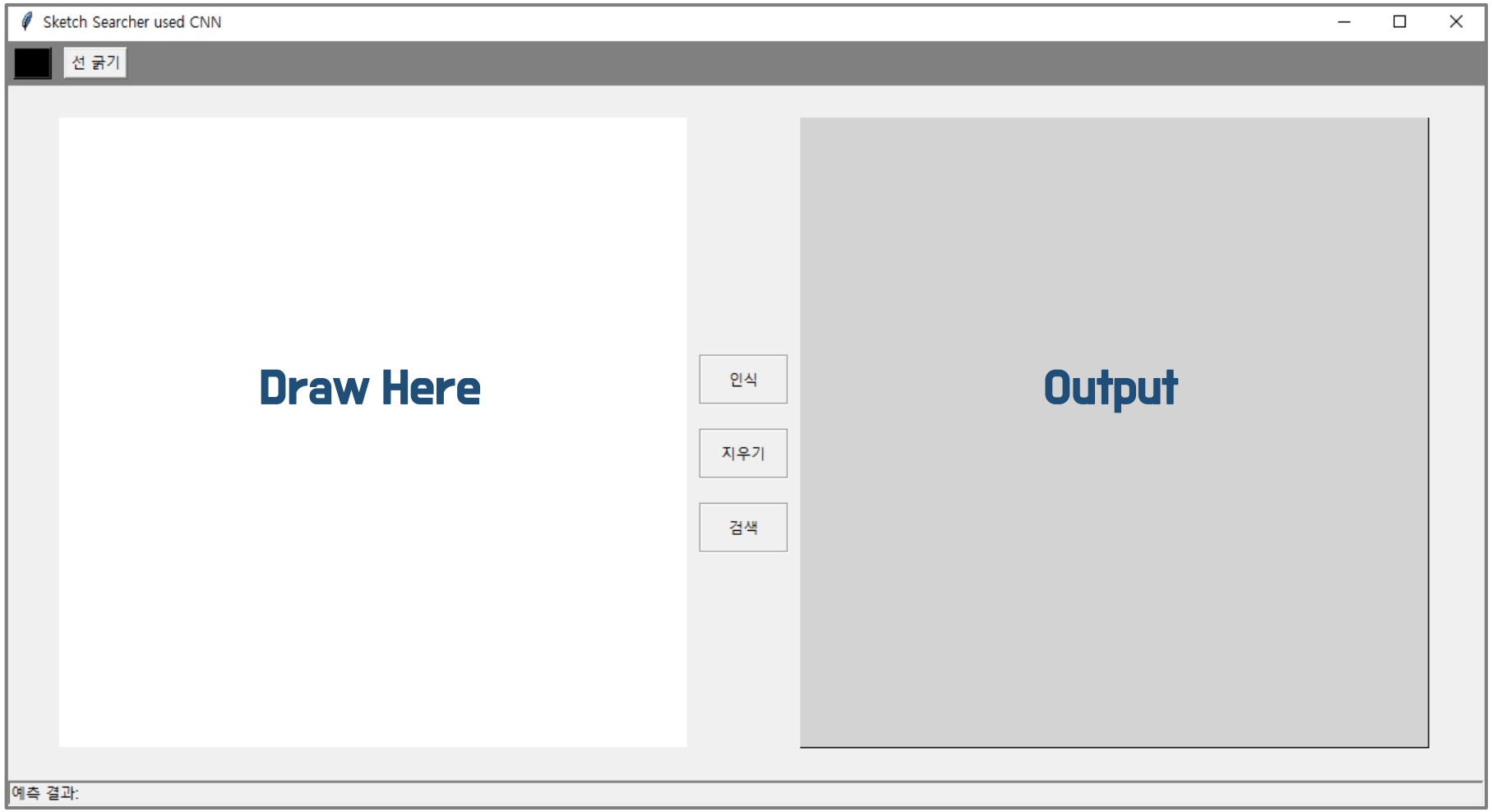
- Draw object that you remember dimly.
- Program recognize drawing image and judge what this image is.
- Print object photo in output canvas with this prediction.
- Push search button, program search this object on web and print related window.

Module

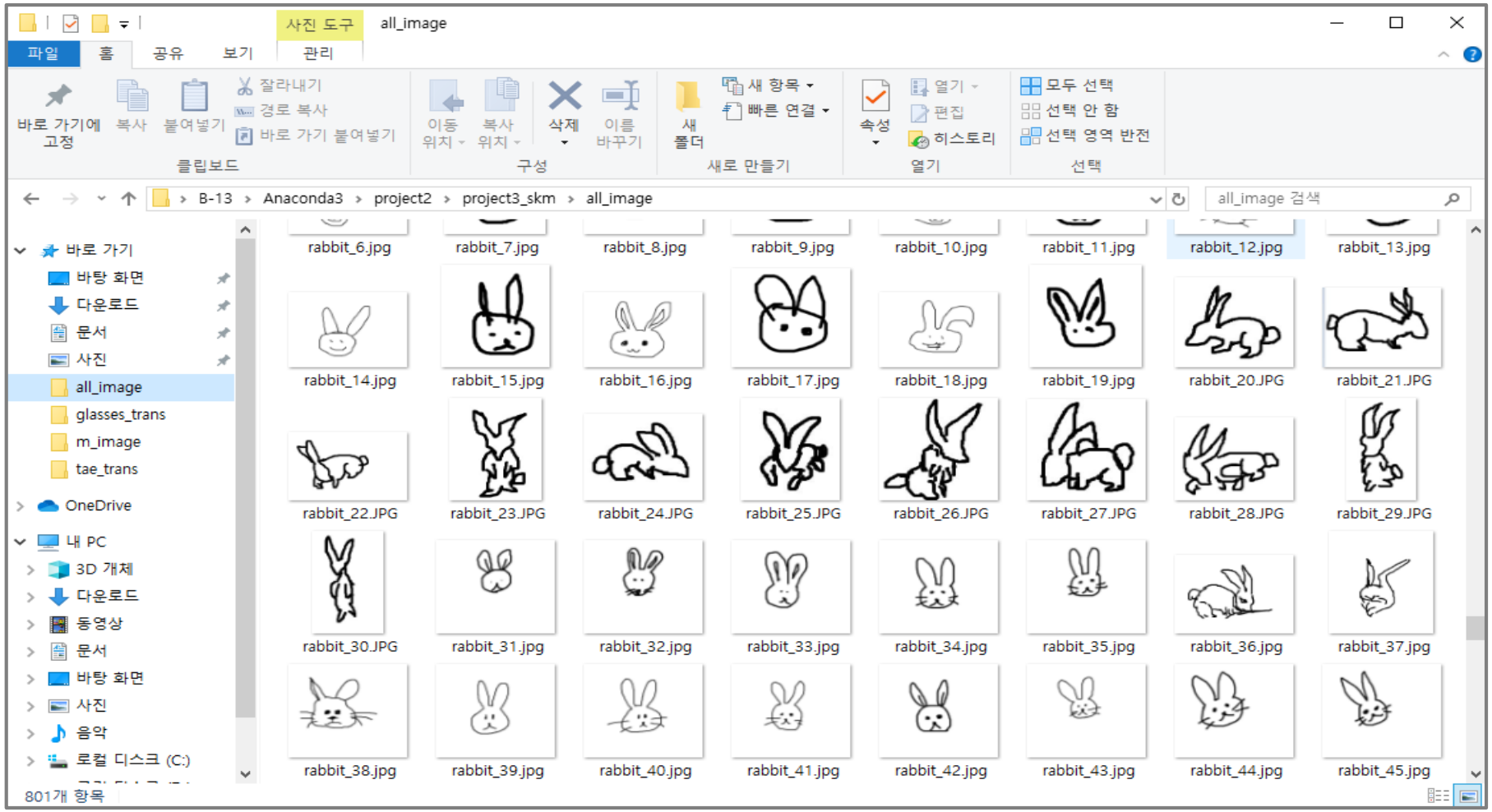
- cv2
- Tkinter
- keras
- Tensorflow
- Selenuum

Step1 : Prepare Window

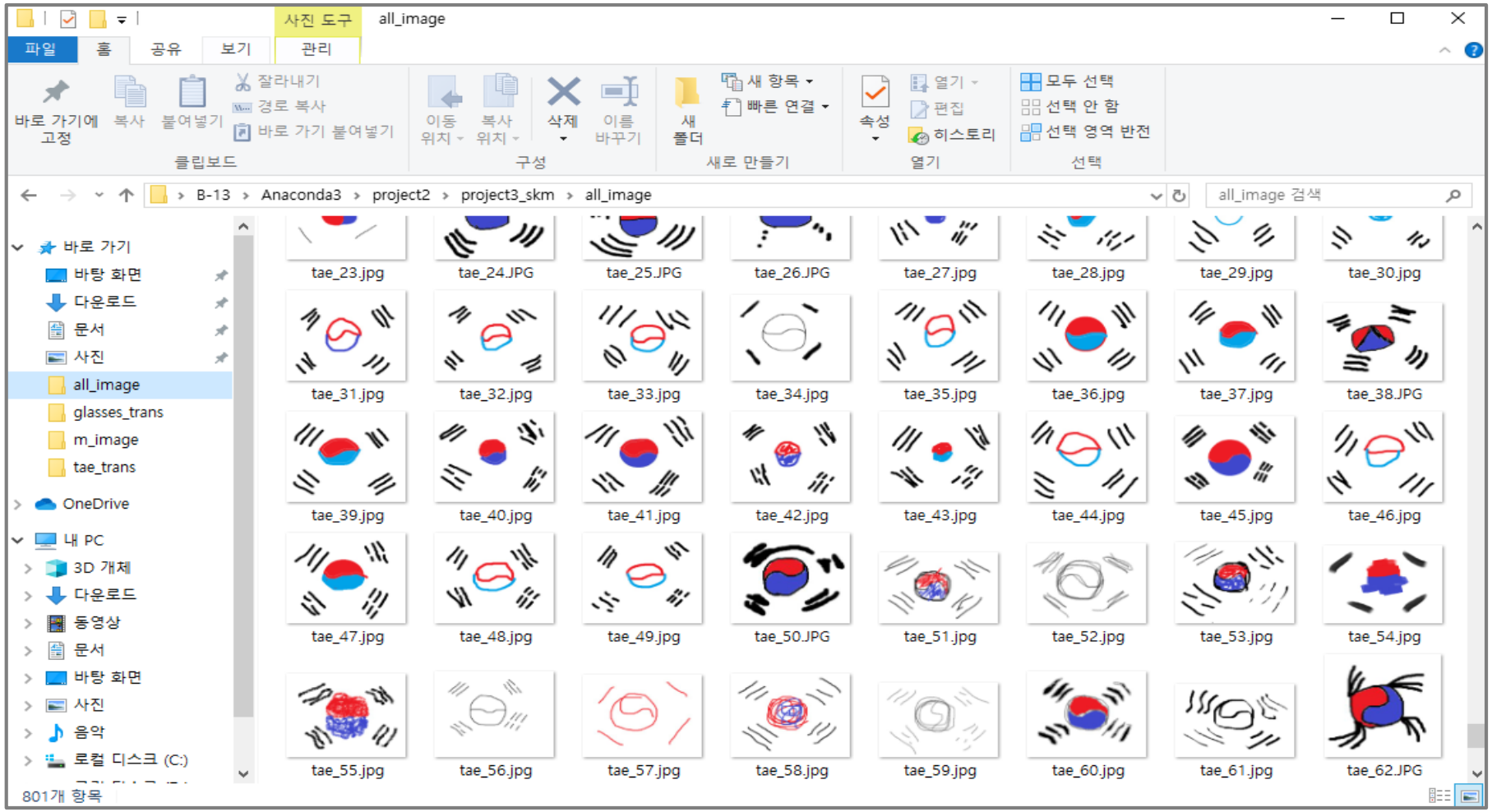
Execution Window



Prepared draw images



Prepared draw images



Setting

1. Install CUDA 10.1
2. Installing cuDNN -> Unzip cuDNN package
3. Pip3 install upgrade tensorflow-gpu
4. Conda install keras-gpu

Modeling

- CNN

Module

- import os, shutil
- from keras.applications import VGG16
- from keras.preprocessing image import ImageDataGenerator

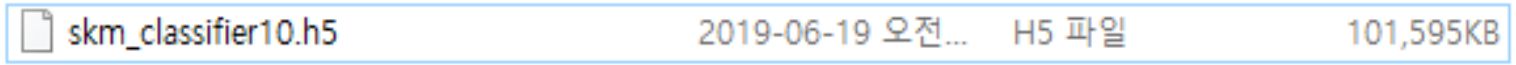
Modeling Result

```
# 모델 생성
history = model.fit_generator(train_generator,
                              steps_per_epoch=100,
                              epochs=5, # 학습 반복횟수
                              validation_data=validation_generator,
                              validation_steps=50)
```

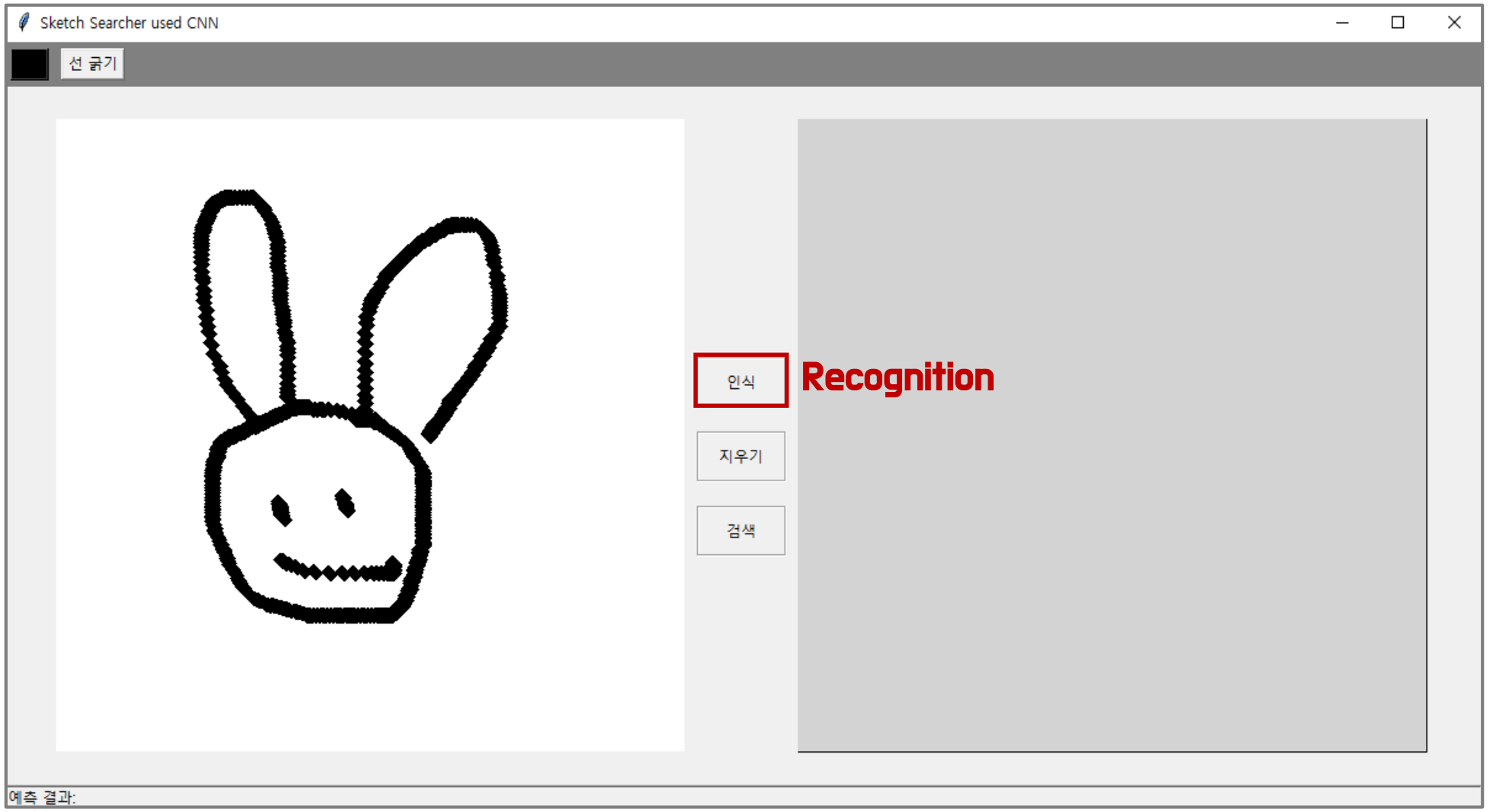
```
Epoch 1/5
100/100 [==============================] - 110s 1s/step - loss: 1.7608 - acc: 0.5220 - val_loss: 1.2274 - val_acc: 0.4900
Epoch 2/5
100/100 [==============================] - 109s 1s/step - loss: 0.6603 - acc: 0.8350 - val_loss: 0.8027 - val_acc: 0.7200
Epoch 3/5
100/100 [==============================] - 109s 1s/step - loss: 0.3317 - acc: 0.9073 - val_loss: 0.6784 - val_acc: 0.7700
Epoch 4/5
100/100 [==============================] - 108s 1s/step - loss: 0.2505 - acc: 0.9213 - val_loss: 0.5089 - val_acc: 0.8400
Epoch 5/5
100/100 [==============================] - 109s 1s/step - loss: 0.1855 - acc: 0.9423 - val_loss: 0.4348 - val_acc: 0.8300
```

```
# 생성한 모델 저장
model.save('skm_classifier10_4.h5')
```

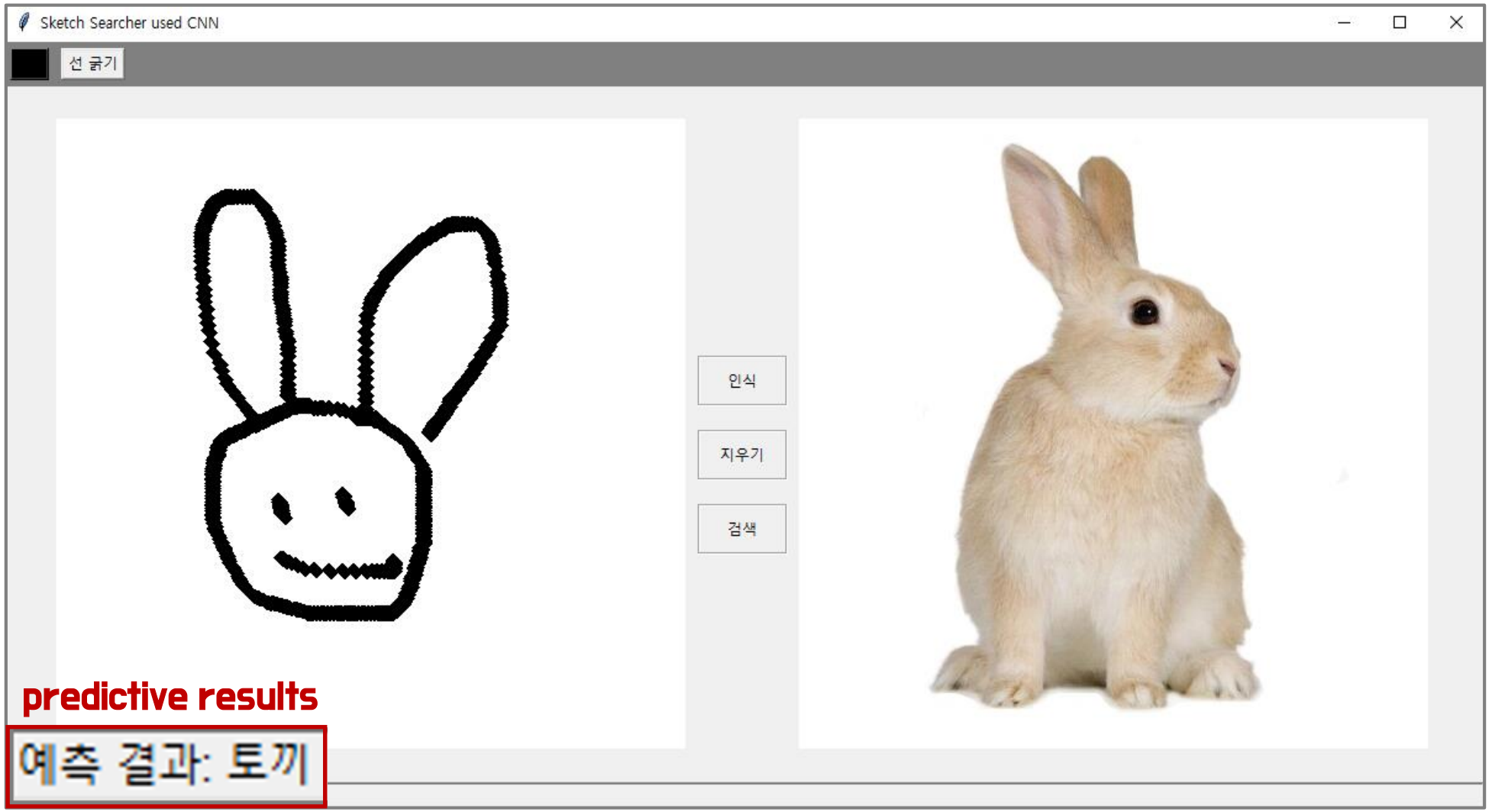
Saved Model



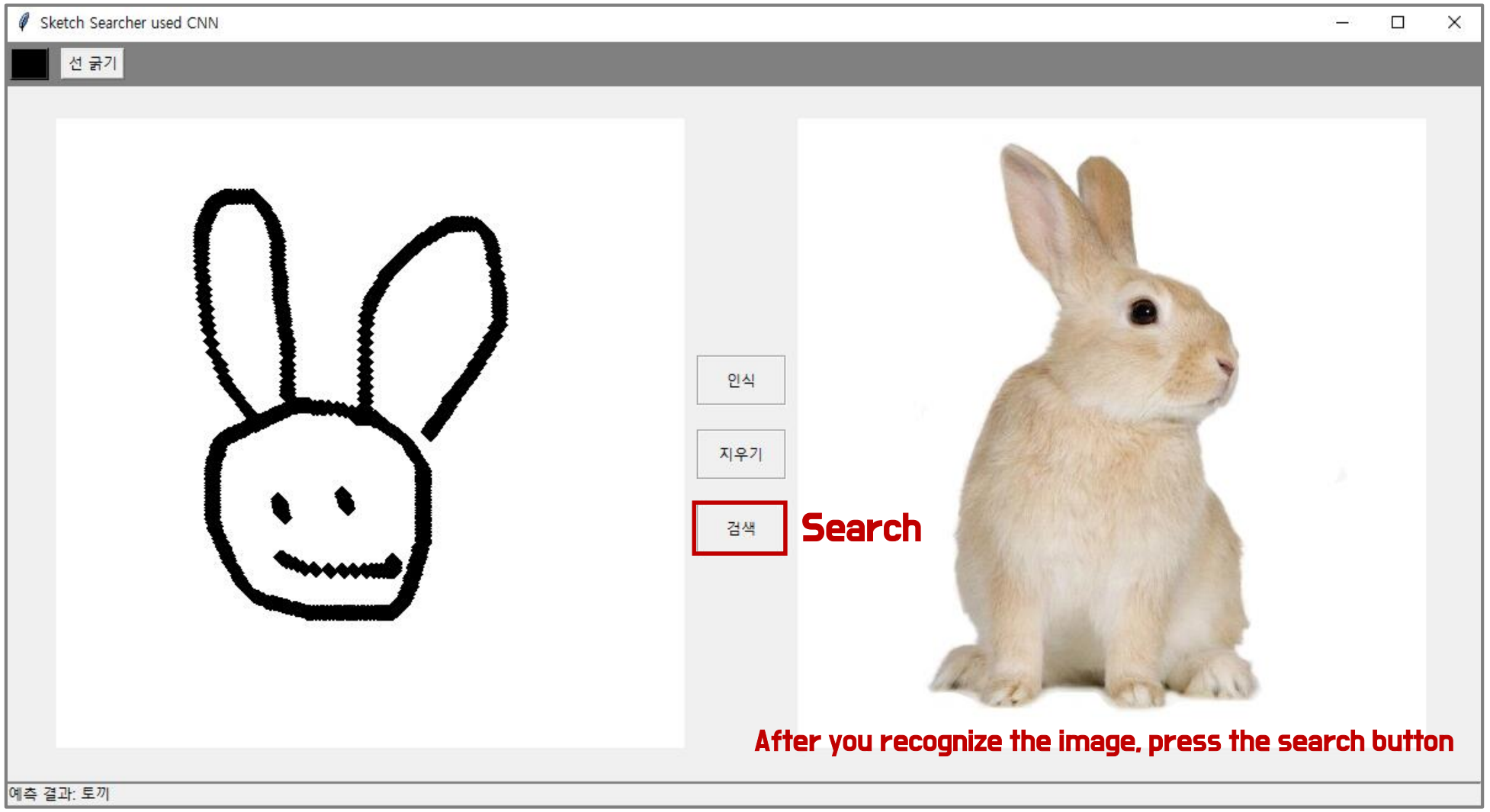
Step3 : Run Program



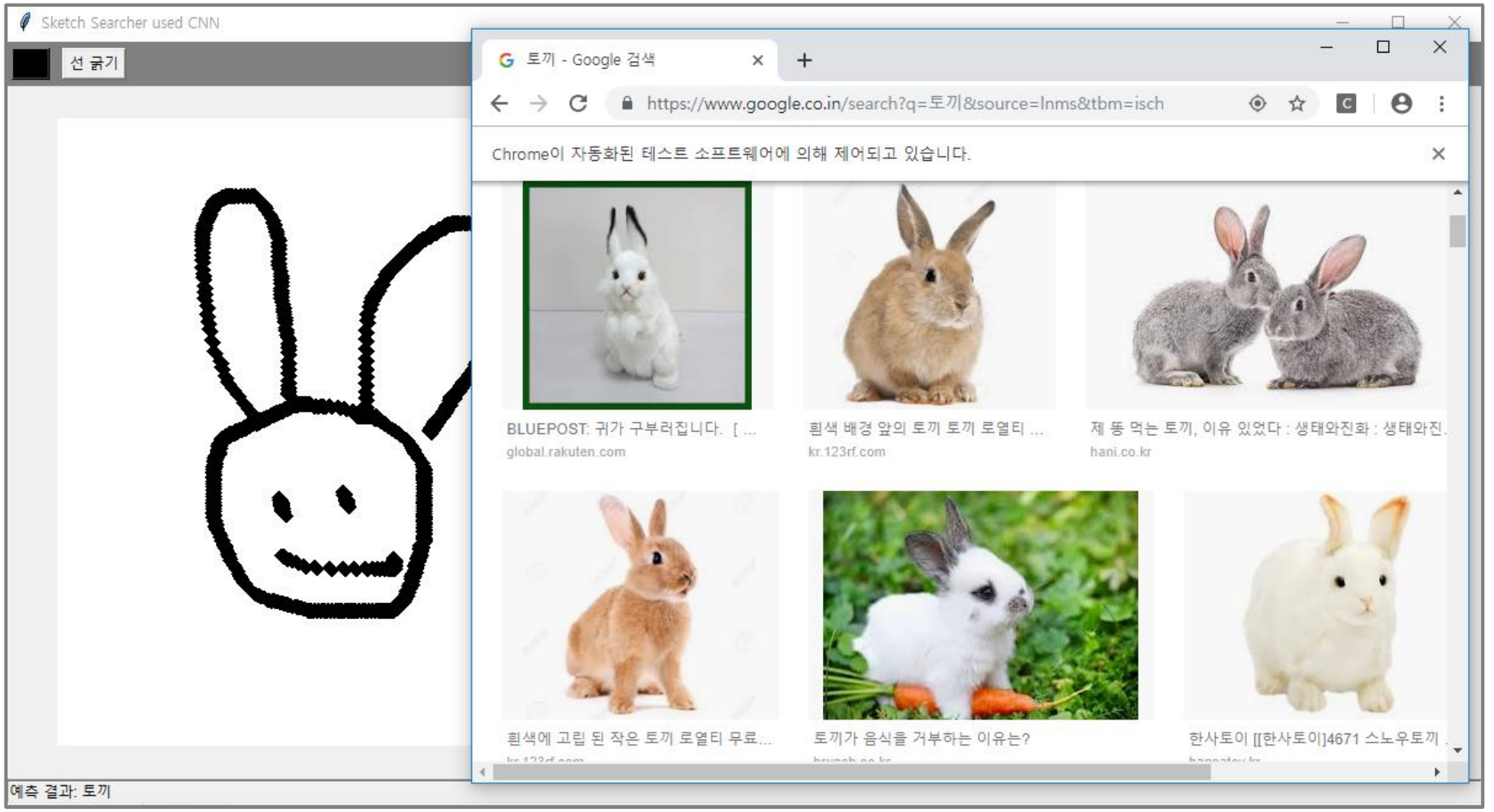
Step3 : Run Program

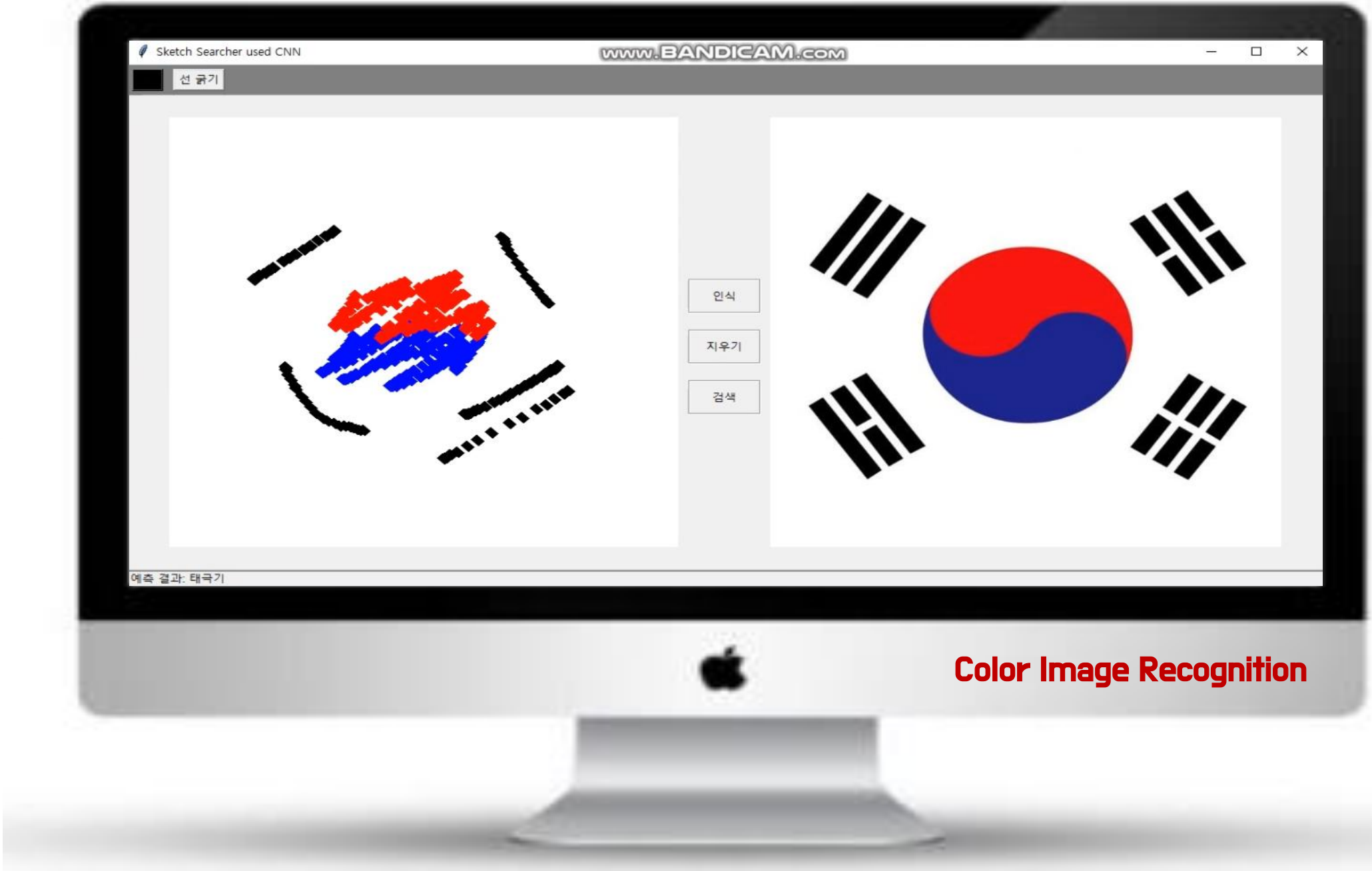


Step3 : Run Program



Step3 : Run Program





Color Image Recognition

Thank you