Lab 8: CNN (CIFAR10-Improving accuracy), CNN (Image Classification), and Pygame

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Part 1: CNN (CIFAR10-Improving accuracy)

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Packages that need to be installed

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There will be four packages that need to be installed to run the program successfully from Google Colab. Those four packages are tensorflow, keras, numpy, and matplotlib.

How to install packages in Python

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To install those packages, you will type “!pip install tensorflow” in Google Colab. You will need to do the same thing with other packages.

After that, you will be able to run the code.

How to execute the program:

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After hitting the run button for each section of the code in Google Colab, you will receive the results as shown in below:

In the “Download and prepare the CIFAR10 datasheet” section:

Graphical user interface, text, application

Description automatically generated

In the Verify the data section:

Graphical user interface

Description automatically generated with medium confidence

In the “Create the convolutional base” section:

You will receive the results as shown below when you run the model.summary()

Graphical user interface

Description automatically generated with low confidence

In the “Add Dense layers on top” section:

You will receive the results as shown below when you run the model.summary()

A picture containing graphical user interface

Description automatically generated

In the “Compile and train the model” section:

A picture containing table

Description automatically generated

In the “Evaluate the model” section:

Graphical user interface, text, application

Description automatically generated

Part 2: CNN (Image Classification)

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Everything will be the same as the part 1 of this lab. However, we will add two more section for this part after the “Evaluate the model” section. Those two sections are: Visualize training results and predict on new data.

How to execute the program

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After hitting the run button in the “Visualize training results” section, you will receive two graphs as shown in below:

Chart, histogram

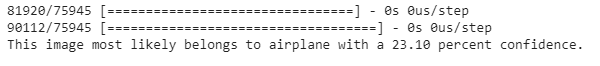
Description automatically generated

In the “Predict on new data” section, you will have to run five different code to predict five different unrecognized images.

Case 1: airplane

url using:

<https://www.zdnet.com/a/img/resize/071727877ee9884b60edd728253d2baadcb3985f/2021/02/23/19631992-64df-4af9-a288-a0cb4112e682/bombardier-globaleye-jet.jpg?width=1200&height=900&fit=crop&auto=webp>



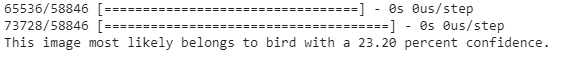
Case 2: automobile

url using: <https://hips.hearstapps.com/hmg-prod.s3.amazonaws.com/images/devel-motors-sixteen-1540564064.jpg>



Case 3: bird

url using: <https://ichef.bbci.co.uk/news/976/cpsprodpb/67CF/production/_108857562_mediaitem108857561.jpg>



Case 4: another bird image

url using: <https://upload.wikimedia.org/wikipedia/commons/5/53/Weaver_bird.jpg>



Case 5: another automobile image

url using: <https://amsc-prod-cd.azureedge.net/-/media/aston-martin/images/default-source/models/valkyrie/new/valkyrie-spider_f02-169v2.jpg?mw=1980&rev=-1&hash=92E23C911BDE23D418D37F9187844B7C>



Part 3: Pygame – Balloon Flight

How to install pgzrun package

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To install the package in Python, you will type “pip install pgzrun” in “Anaconda Powershell Prompt” program as shown below:



Moreover, you will do the same thing for pygame and pgzero to run the game successfully.

How to execute the program:

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After hitting the run button for the code, a window below will show up for you to play the game.

Moreover, you will hear the background music when running the code.

A picture containing graphical user interface

Description automatically generated

How to play the game:

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You need to use the right-click to keep the balloon flow add pass all the obstacles to get as many as score you can to be in the top five high scores of the game. You will have a bar health at the top left conner. Whenever you get hit by the obstacles, your health will be decreased. When you are out of your health, you will be minus one lives (next to the score). You will have at least two lives to play this game. When you are out of lives, the game will be over. It will also the high scores at the end of the game.

When the game is over, the high scores will be shown as below.

Text

Description automatically generated with low confidence

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