

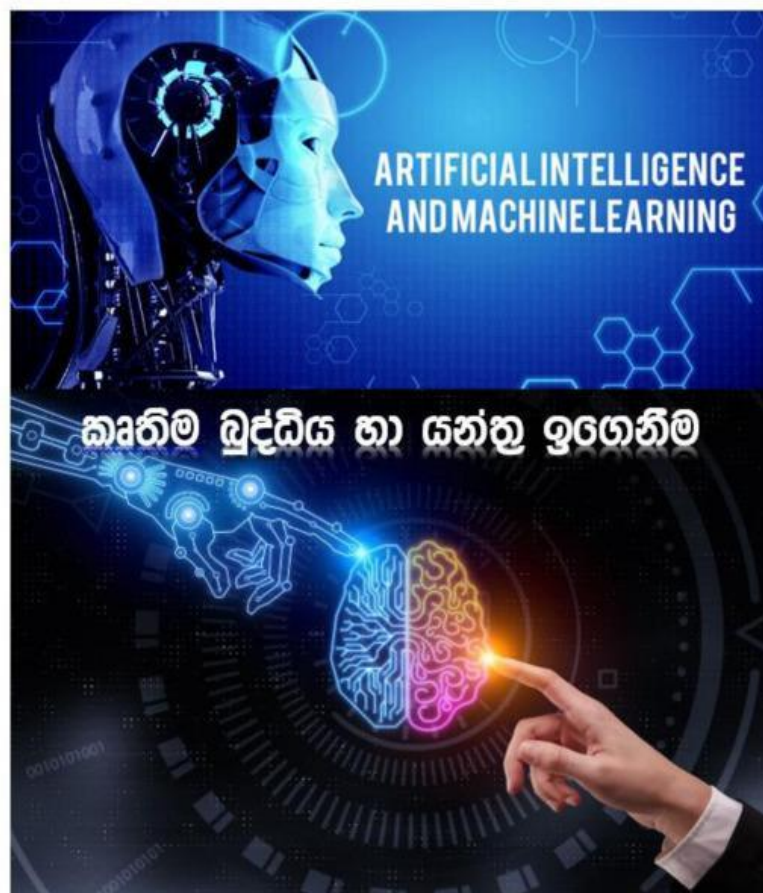
Project 159



**Coding
School**



AI and Machine Learning



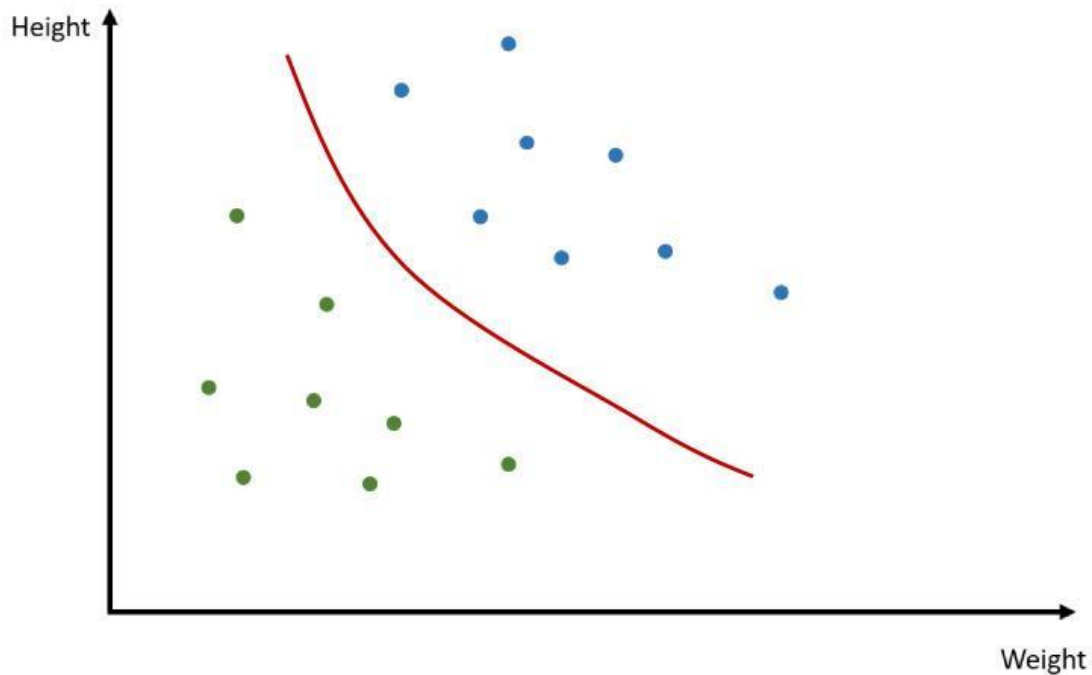
Start here

- ❖ There are two main components of Supervised Learning.
- ❖ Those parts are Regression and Classification.
- ❖ The questions that are tried to be solved in regression are the questions that have an output from real numbers. For example, problems such as training a machine learning model using a data set and training a model to predict the house price belong to the category of regression.
- ❖ The questions that are tried to be solved in Classification are the questions that give result from Class. For example, upload an image and what is that image. Problems such as training a model to predict whether today's climate is bad or not belong to the classification category.
- ❖ Here we consider classification.
- ❖ Let us consider a simple data set like below.

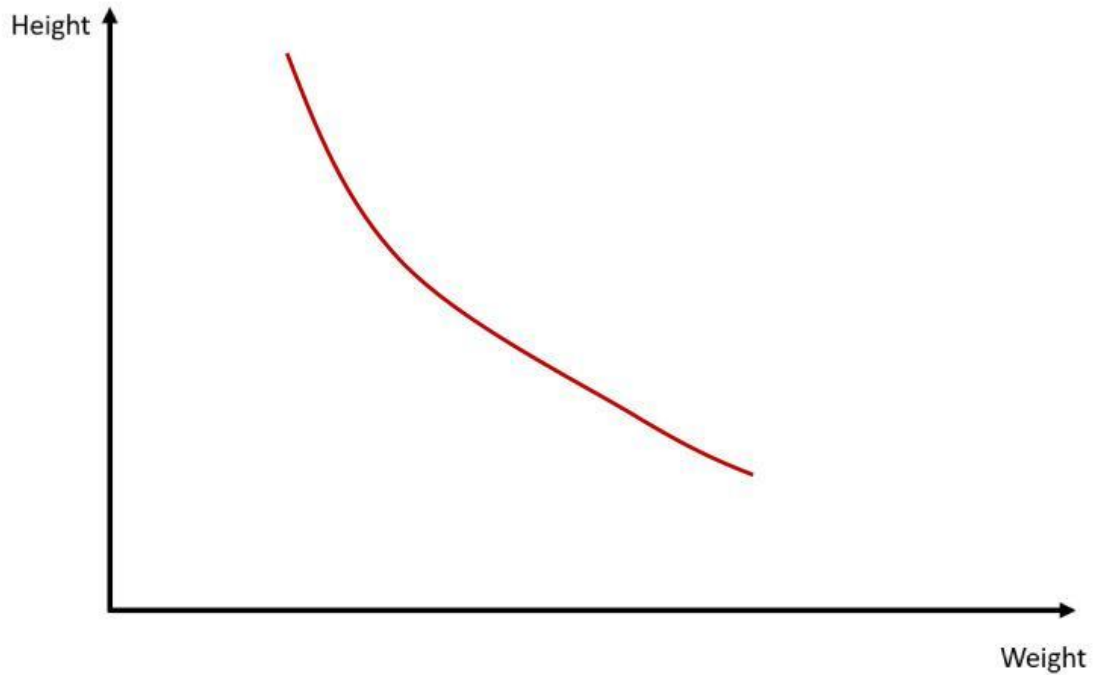
Weight	Height	Gender
77	79	Male
56	17	Male
21	25	Female
83	41	Female
36	23	Female
19	41	Female
22	17	Male
...
20	41	Female
45	79	Male
34	41	Male
78	79	Male

- ❖ This data set has three columns. Here we try to predict the gender according to the weight and height.

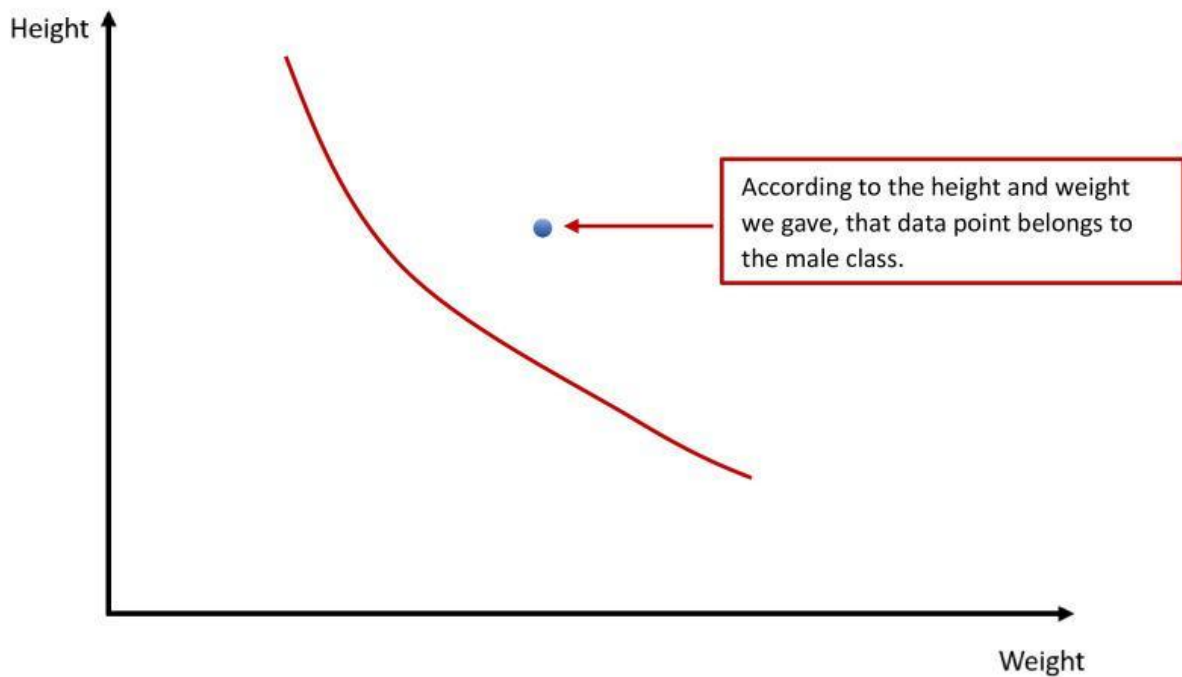
❖ Let us now visualize this data set in a graph.



- ❖ In this graph, the female category is represented in green and the male category is represented in blue.
- ❖ The purpose of using a model here is to make it easy to identify these two classes separately.
- ❖ When we train a model using this data set, the machine recognizes a pattern like the above.
- ❖ According to that pattern, the two classes are clearly separated.
- ❖ When a machine learning model is trained in this way, the following pattern can be obtained.



- ❖ According to this pattern, depending on the height and weight we give, the model has the ability to predict which class the data point belongs to, otherwise it can be assumed.



- ❖ Let's look at the second part of lesson 7 of the AI and machine learning course on Code.org.

https://studio.code.org/s/aiml-2023/lessons/7/levels/2?section_id=4741330

- ❖ The data set in that lesson is as follows.

sides	border color	fill color	background color	size	shape
0	black	pink	white	big	circle
4	black	pink	white	big	square
0	black	yellow	white	big	circle
0	red	yellow	white	big	circle
0	black	yellow	white	big	circle
4	orange	pink	white	big	square
0	red	yellow	white	small	circle
0	red	yellow	white	big	circle
4	black	brown	white	small	square
3	red	white	white	small	triangle
0	red	yellow	white	big	circle

- ❖ Here a data set is given according to the shapes. The number of sides of those shapes, the color of the border of the shape, the color inside the shape, the background color, the size of the shape and the name of the shape are given.
- ❖ This data set is a supervised data set as it is a labeled data set.
- ❖ Here, a machine learning model should be trained to predict the shape of the shape.
- ❖ For that, select the border color, fill color and shape size.

Predict **shape** based on **sides**, **border color**, **fill color**, **size**

sides	border color	fill color	background color	size	shape
0	black	pink	white	big	circle
4	black	pink	white	big	square
0	black	yellow	white	big	circle
0	red	yellow	white	big	circle
0	black	yellow	white	big	circle
4	orange	pink	white	big	square
0	red	yellow	white	small	circle
0	red	yellow	white	big	circle
4	black	brown	white	small	square
3	red	white	white	small	triangle
0	red	yellow	white	big	circle

There are 100 rows of data.

size

Data Type: categorical
Description: Either big or small
Relationship information:

size	circle	square	triangle
big	37%	47%	16%
small	12%	27%	61%

Column information

Train

❖ Then a model could be trained with 90% accuracy.

Result

Predict **shape** based on **sides**, **border color**, **fill color**, **size**

Accuracy: 90.00%

Details

❖ Now make a prediction for the following figure.

Try it out!

sides: 4

border color: black

fill color: brown

size: small

Predict

A.I. predicts

shape: square

- ❖ In that way, perform the activities on the lesion.
- ❖ Change the labels you crawl and prepare the machine learning model and train it.