Advance Artificial Intelligence

인공지능 특론

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in·tel·li·gence

/inˈteləjəns/

noun

1. the ability to acquire and apply knowledge and skills
   “an eminent man of great intelligence”

in·tel·li·gent

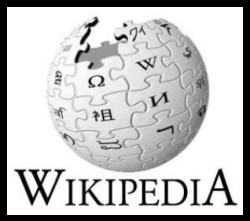
/inˈteləjənt/

adjective

having or showing intelligence, especially of a high level in a natural way.

synonyms: clever, bright, brilliant, smart, discerning …

Intelligence

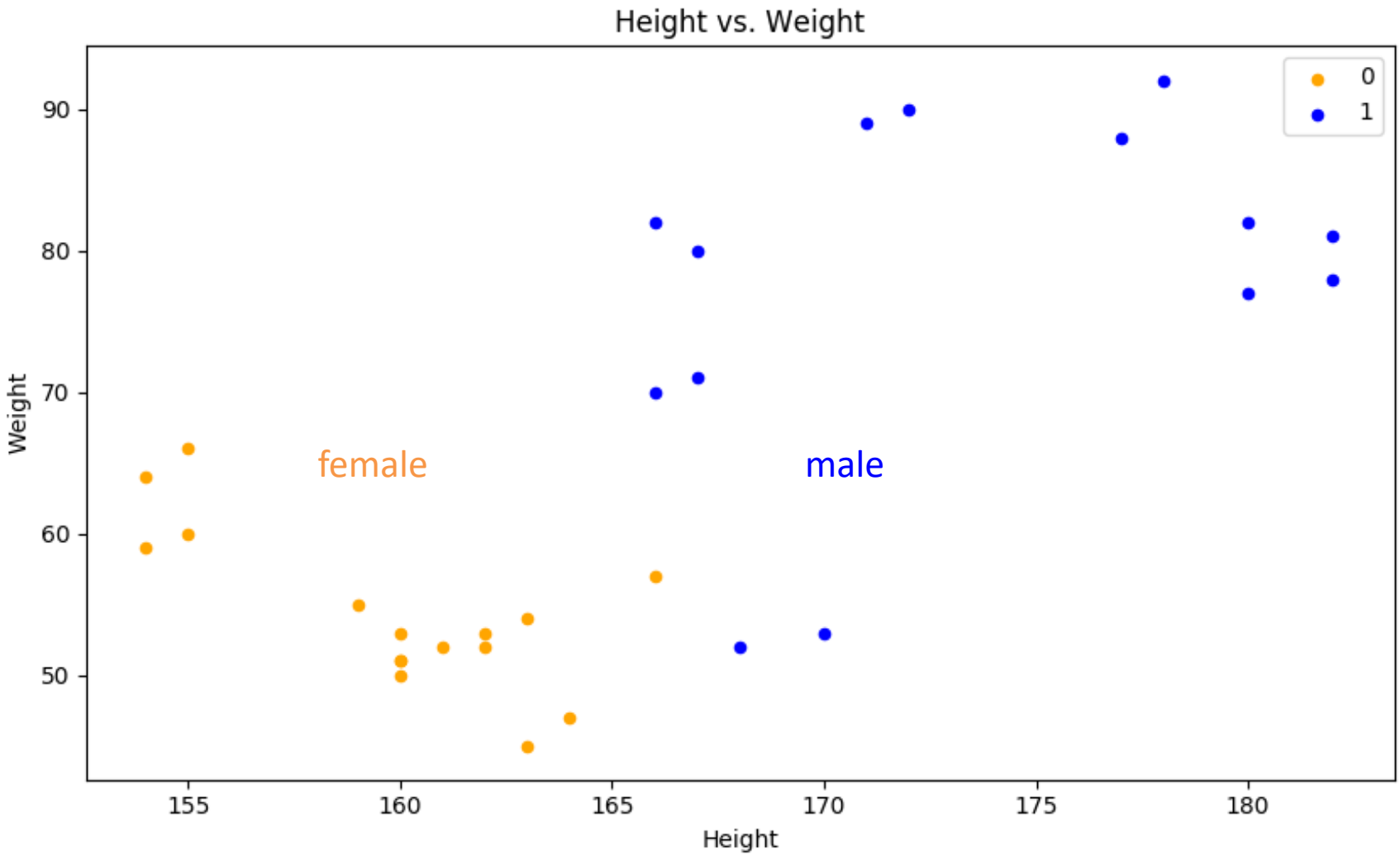


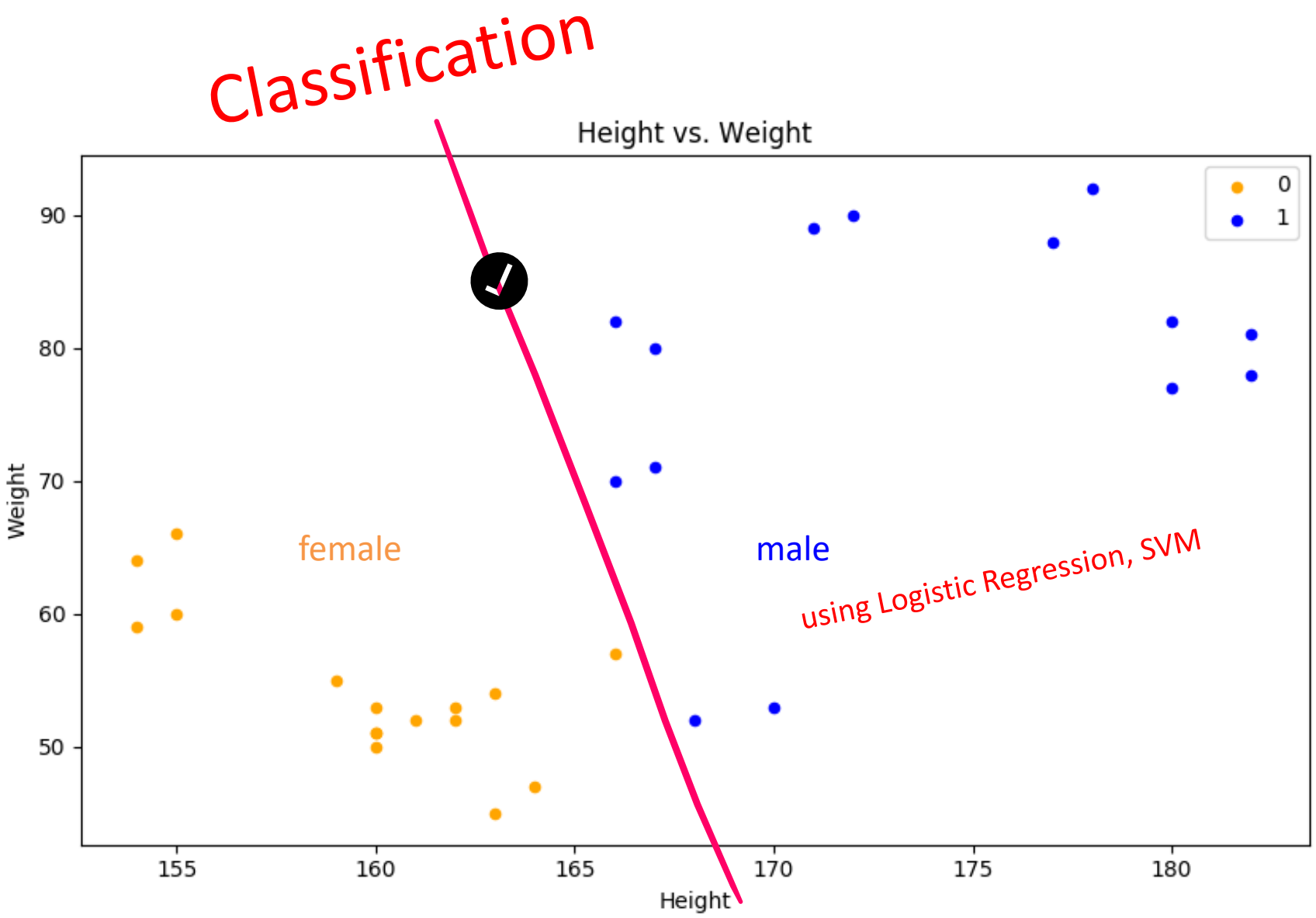
- One's capability for logic, understanding, self-awareness, learning, planning, creativity, and problem solving
- The ability to perceive information, and to retain it as knowledge to be applied towards adaptive behaviors within an environment

Artificial Intelligence

- Intelligence exhibited by machines
- A computerized version of the human intelligence
- Theory and development of computer systems able to perform tasks such as visual perception, voice recognition, decision-making, and translation between languages

Classification & Prediction


Height vs. Weight
0
1
female
male
Weight
Height
90
80
70
60
50
155
160
165
170
175
180


Classification
Height vs. Weight
0
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90
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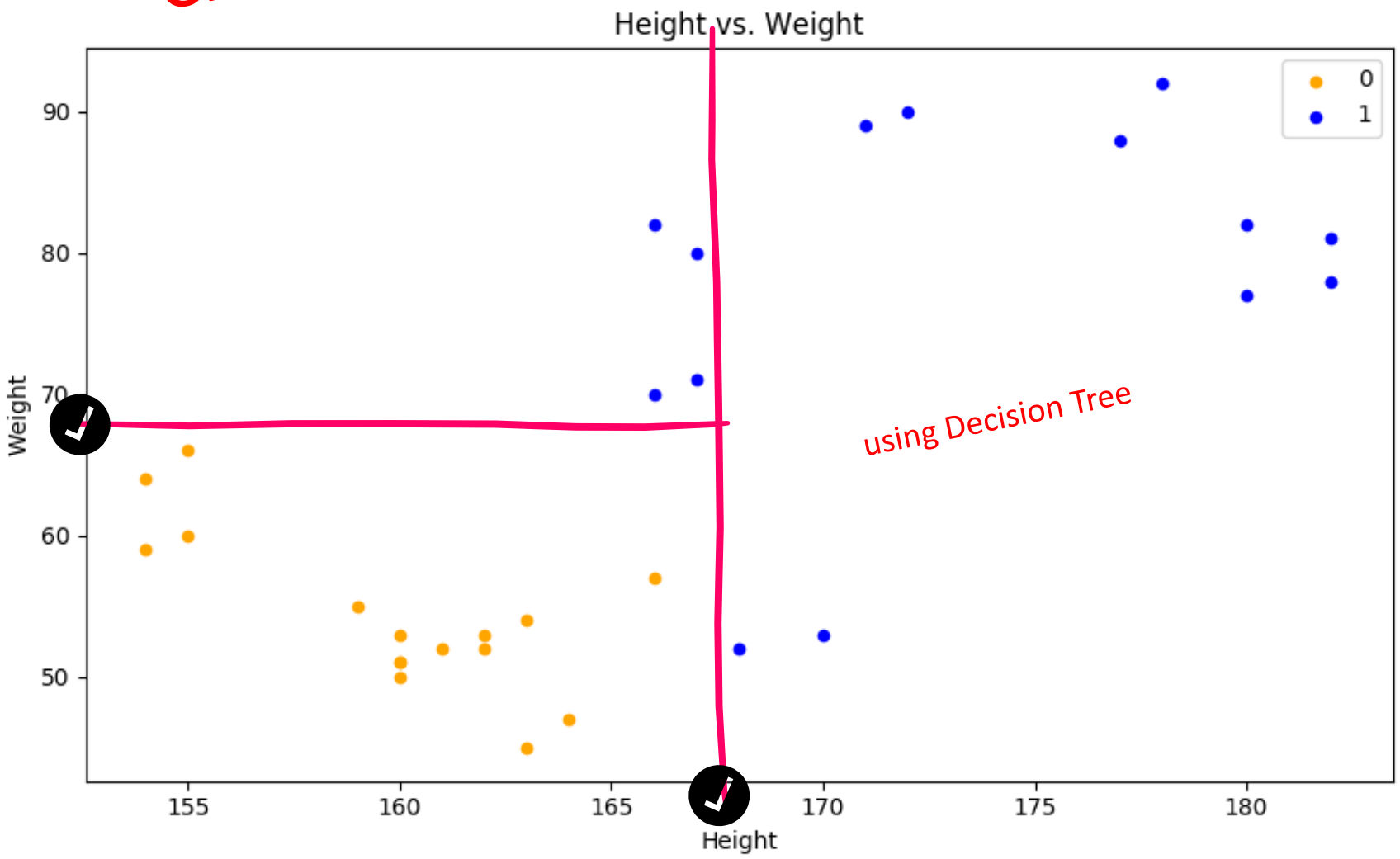
60
50
Weight
155
160
165
170
175
180
Height
female
male
using Logistic Regression, SVM

Classification



68

167

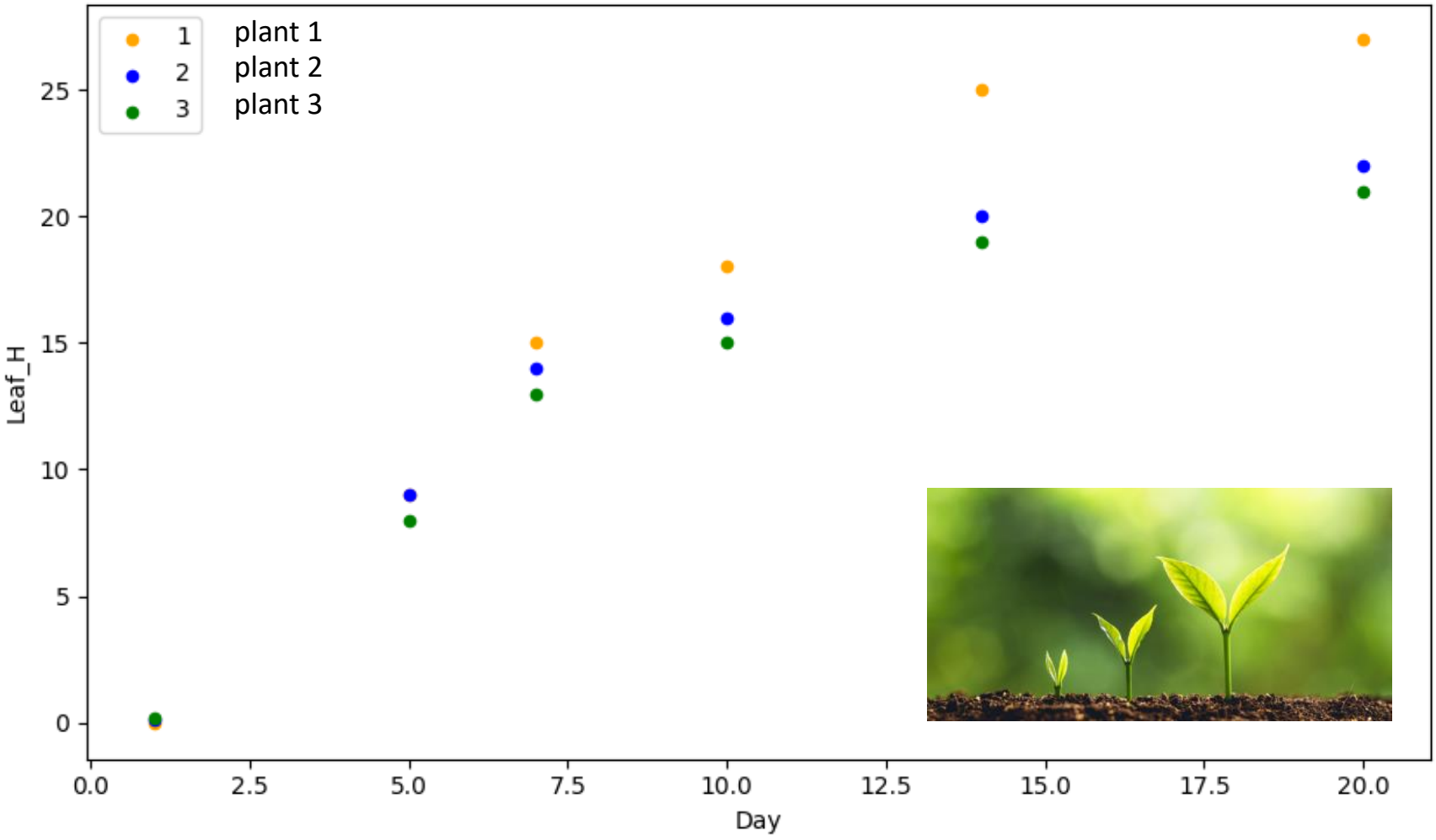
Classifier

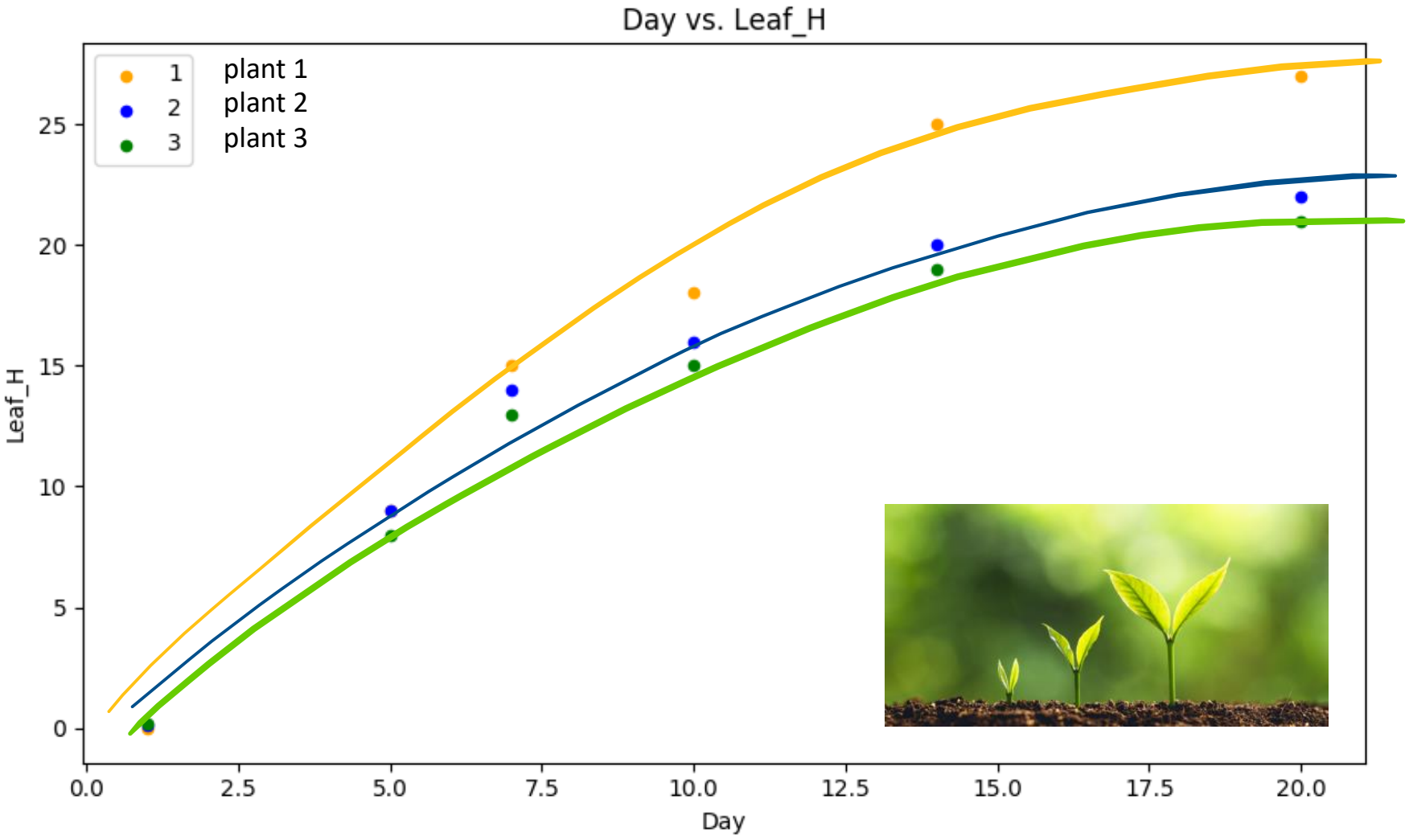
Machine Learning

- SVC (서포트벡터머신)
- DecisionTreeClassifier (결정트리)
- RandomForestClassifier (랜덤포레스트)
- XGBClassifier (XGBoost, eXtreme Gradient Boosting, Boosting or Additive Training) (부스팅)

Deep Learning

- LogisticRegression (논리회귀)
- Multilayer Neural Networks
- CNN/RCNN/GCNN


1
2
3
plant 1
plant 2
plant 3
Leaf_H
Day
0
5
10
15
20
25
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0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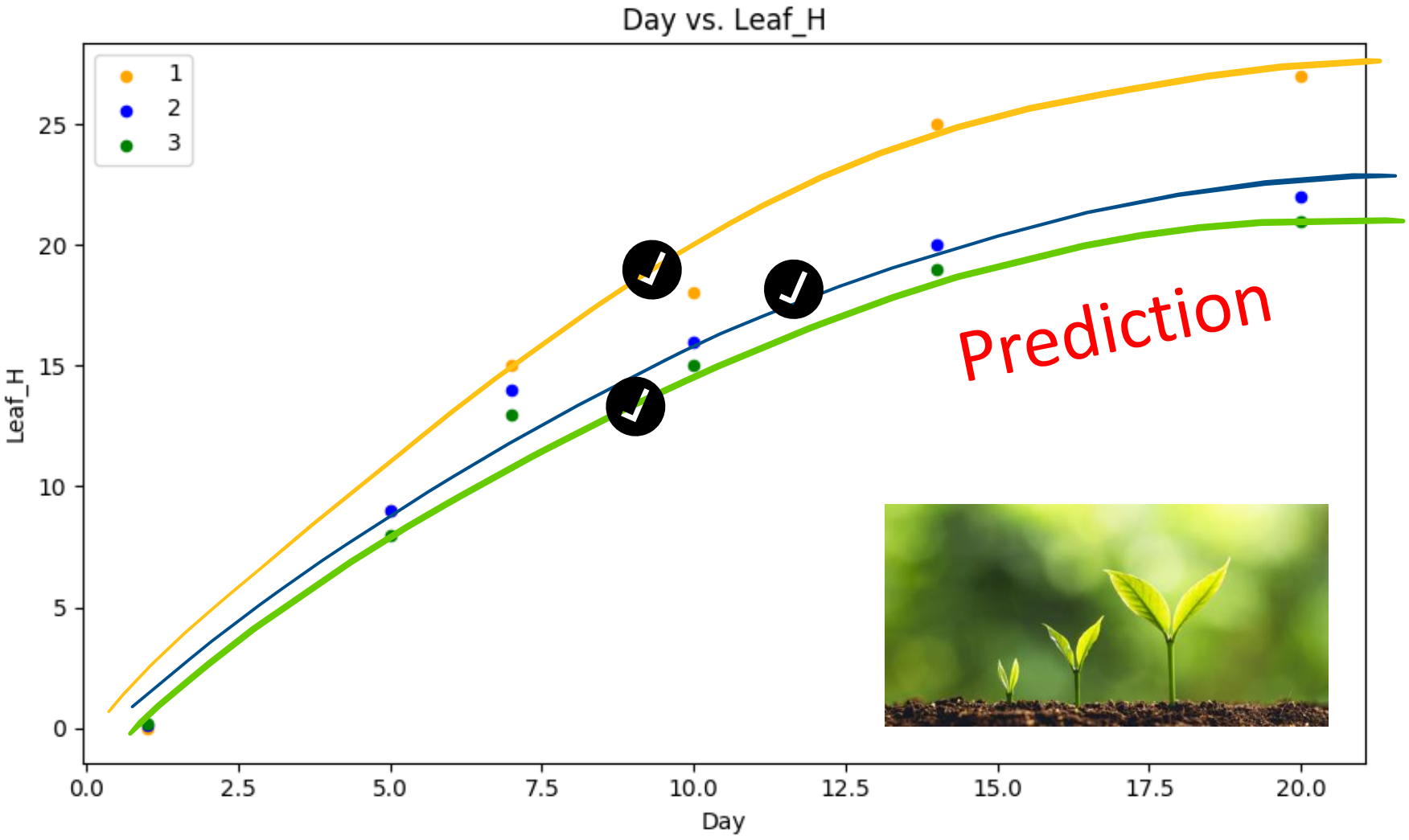
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Prediction

Regressor for prediction

Machine Learning

- KNeighborsRegressor (K-근접)
- DecisionTreeRegressor (결정 트리)
- RandomForestRegressor (랜덤 포레스트)
- GradientBoostingRegressor (부스팅)
- XGBRegressor (부스팅)
- CatBoostRegressor (부스팅)

Deep Learning

- LinearRegression (선형 회귀)
- MLPRegressor
- RNN/LSTM/GRU

Statistical/Structural Methods
Neural Network Approaches

ARTIFICIAL INTELLIGENCE

IS NOT NEW

ARTIFICIAL INTELLIGENCE

Any technique which enables computers to mimic human behavior

MACHINE LEARNING

AI techniques that give computers the ability to learn without being explicitly programmed to do so

DEEP LEARNING

A subset of ML which make the computation of multi-layer neural networks feasible

1950's 1960's 1970's 1980's 1990's 2000's 2010s

Advanced
Artificial Intelligence

Seminar-based class by the students

Challenging topics in …

Computer Vision
Pattern Recognition
Object Detection
Image Recognition
Image Segmentation

and other related topics

Let's find

Open souce-based implementations (1 or 2)

Python/TensorFlow
Keras, Sci-kit Learn,
PyTorch, Caffe, and etc.

Car Plate Recognition
Plant Disease Detection
Motion Recognition
…

All the students

- Find 1 or 2 projects (open souce implementation)
- Understand and present
- can enhance the existing project (optional)
- publish the implementation in Kaggle.com

Schedule

Week	Presenter
1	
2	Introduction
3	Topic selection and self-driven study
4	제이납, 데바프리아, 프린스
5	키자르, 이므란, 서걸
6	아흐메드, 나임, 아시프
7	박세준, 왈리드, 무하마드
8	파이자, 나와즈, 노샤르완

Schedule

Week	Presenter
9	김진숙, 아티프, 문준성, 이상우
10	2nd turn
11	2nd turn
12	2nd turn
13	2nd turn
14	2nd turn
15	2nd turn
16	2nd turn

Evaluation Guidline

- Is the topic challengable and practical?
- Presentation skill (easy to understand?)
- Is the material prepared well?