

A close-up photograph of pink cherry blossoms on dark, thin branches. The background is a soft, out-of-focus white and light pink, suggesting a bright, sunny day. The word "STACKING" is written in a clean, white, sans-serif font in the center of the image. A thin white vertical line is positioned to the right of the text.

STACKING

STACKING



What is stacking?



Benefit of stacking



How stacking
works



Stacking in
bagging's
perspective



Stacking with
supervised
learning



Stacking with
reinforcement
learning



Meta learning



Code

WHAT IS STACKING?



STACKING IS AN ENSEMBLE LEARNING TECHNIQUE THAT COMBINES MULTIPLE MACHINE LEARNING MODELS TO IMPROVE PREDICTIVE PERFORMANCE. IT WORKS BY TRAINING A "META-MODEL" TO LEARN HOW TO BEST COMBINE THE PREDICTIONS FROM SEVERAL BASE MODELS.



BENEFIT OF STACKING

	Benefit of stacking
Supervised learning	<ul style="list-style-type: none">- Improve predictive performance- (Improve generalization)- (Robustness to overfitting)- Adaptability
Reinforcement learning	<ul style="list-style-type: none">- Improve policy performance- Adaptability

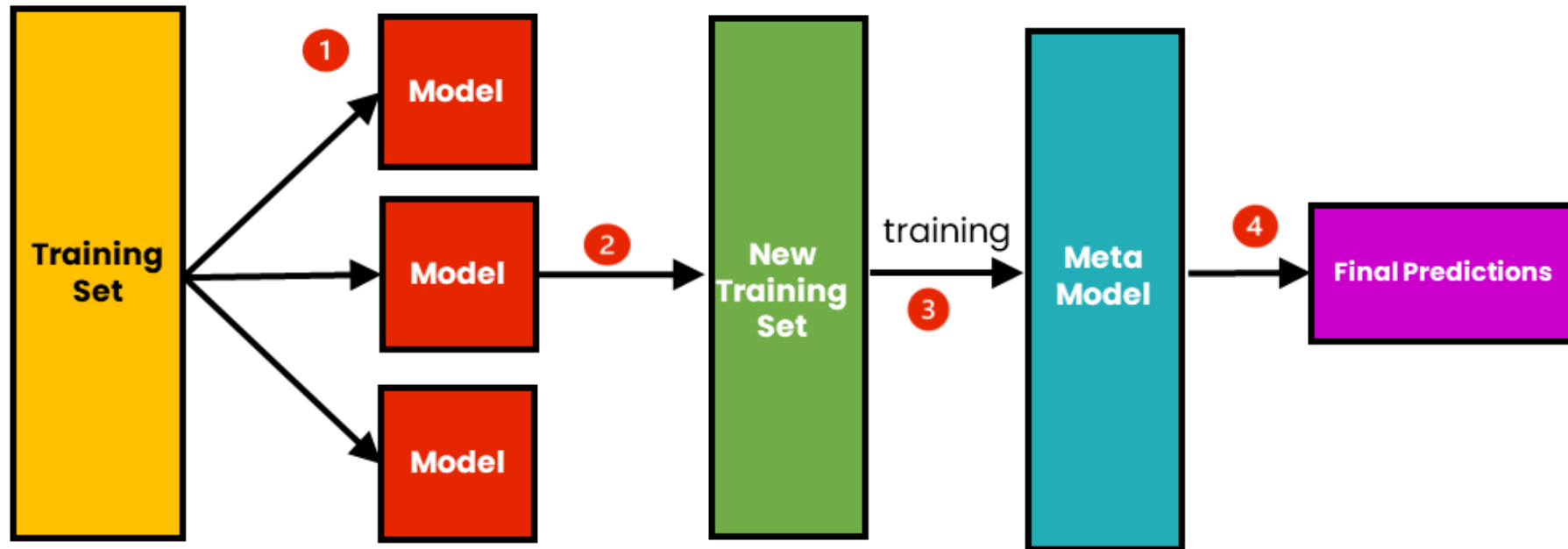


HOW STACKING WORKS

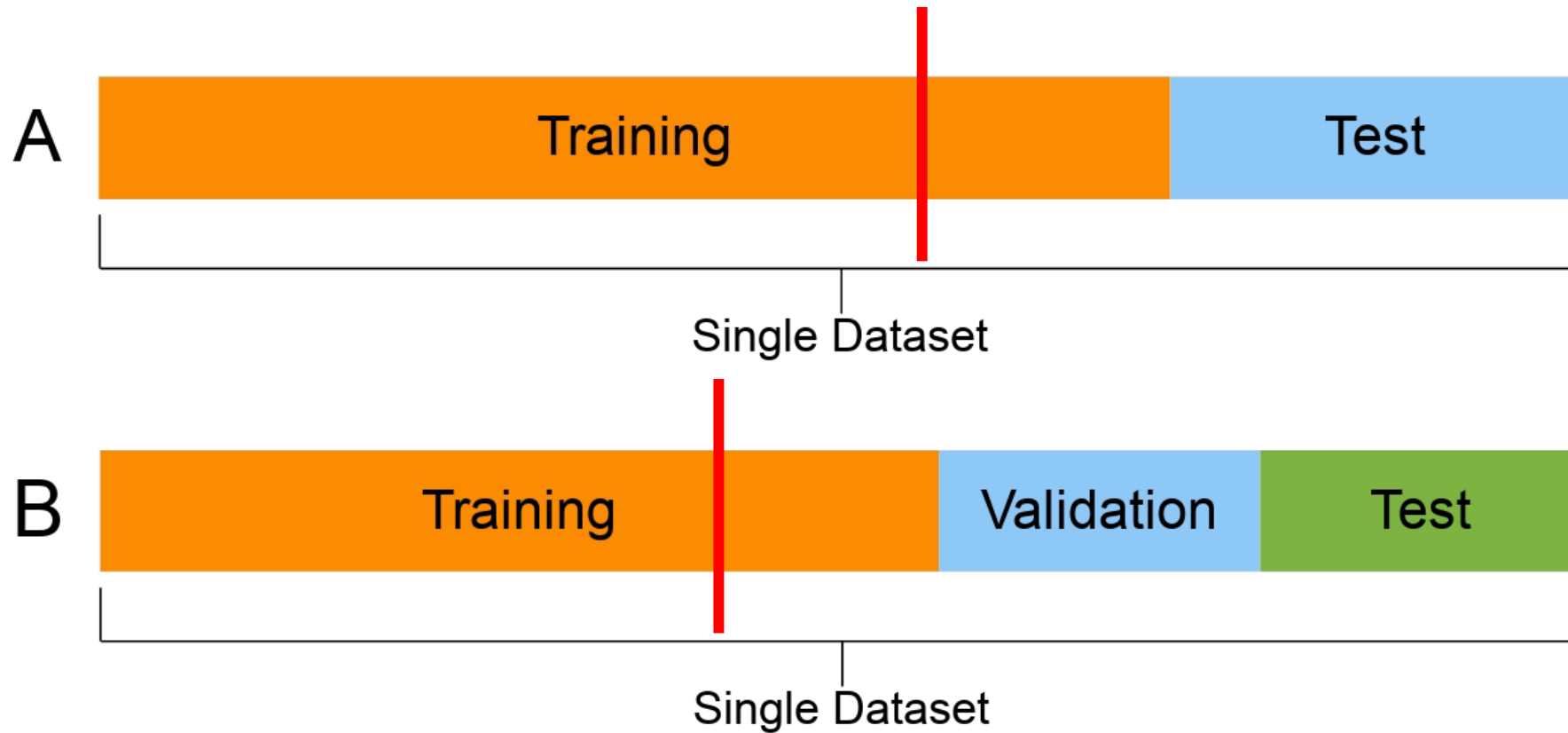
- Bootstrapping
- Training multiple models
- Predictions
- Meta-learner
- Final prediction

HOW STACKING WORKS

The Process of Stacking



HOW STACKING WORKS



HOW STACKING WORKS

STACKING IN BAGGING'S PERSPECTIVE

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- More ready to adopt to new concept (new data distribution)
- Stacking mechanism in adaptation is like changing original data distribution of base model to new data distribution.



STACKING IN BAGGING'S PERSPECTIVE

STACKING WITH SUPERVISED LEARNING

STACKING WITH SUPERVISED LEARNING

การรวมกันเชิงเส้นจะทำให้ stacking มีคุณสมบัติแบบ bagging ด้วย



Classification

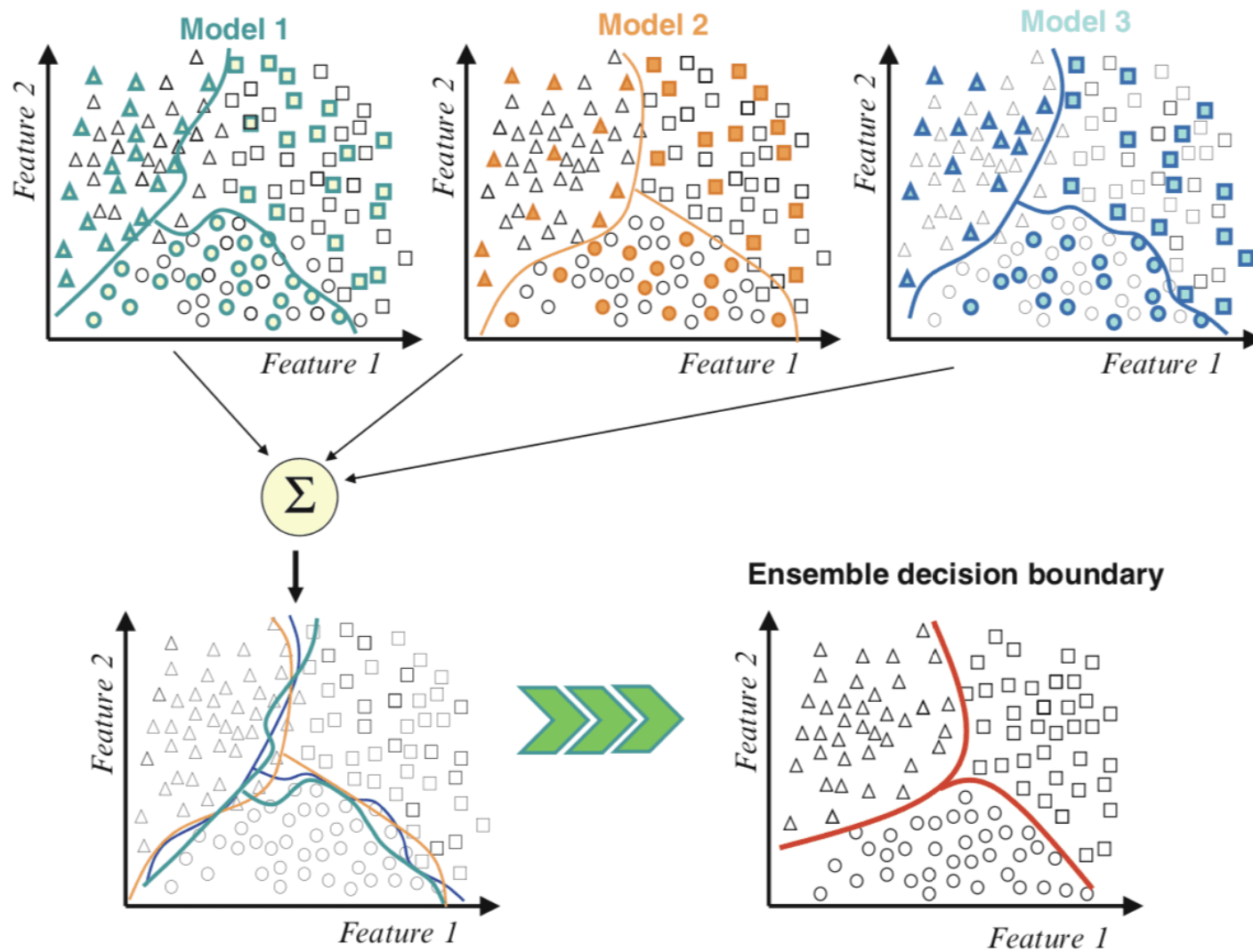
logistic regression (+ regularization ได้)



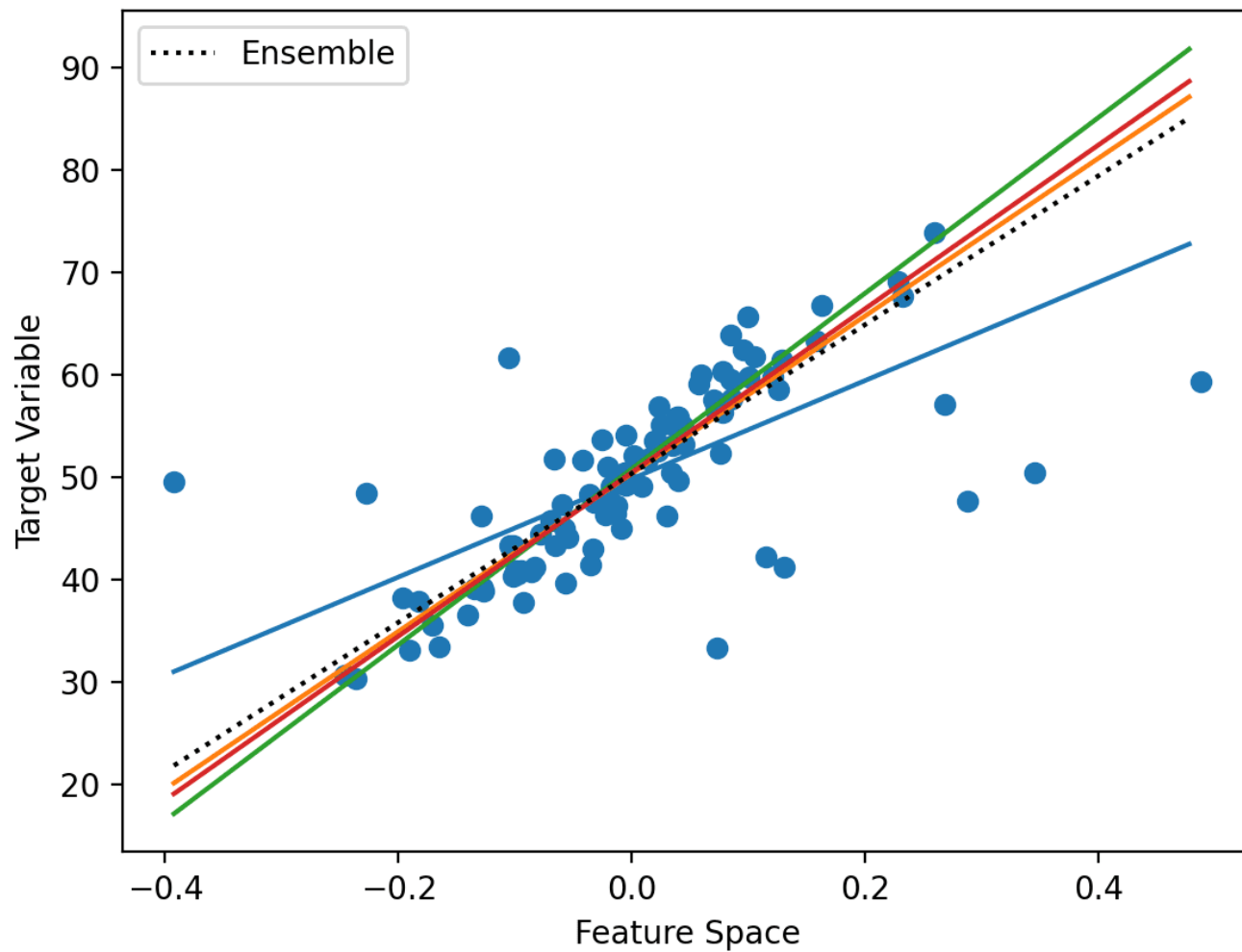
Regression

linear regression (+ regularization ได้)

ใช้ algorithm อื่น ๆ นอกจาก 2 ตัวนี้ได้ไหม ==> ใช้ได้แหละ



STACKING WITH SL - CLASSIFICATION

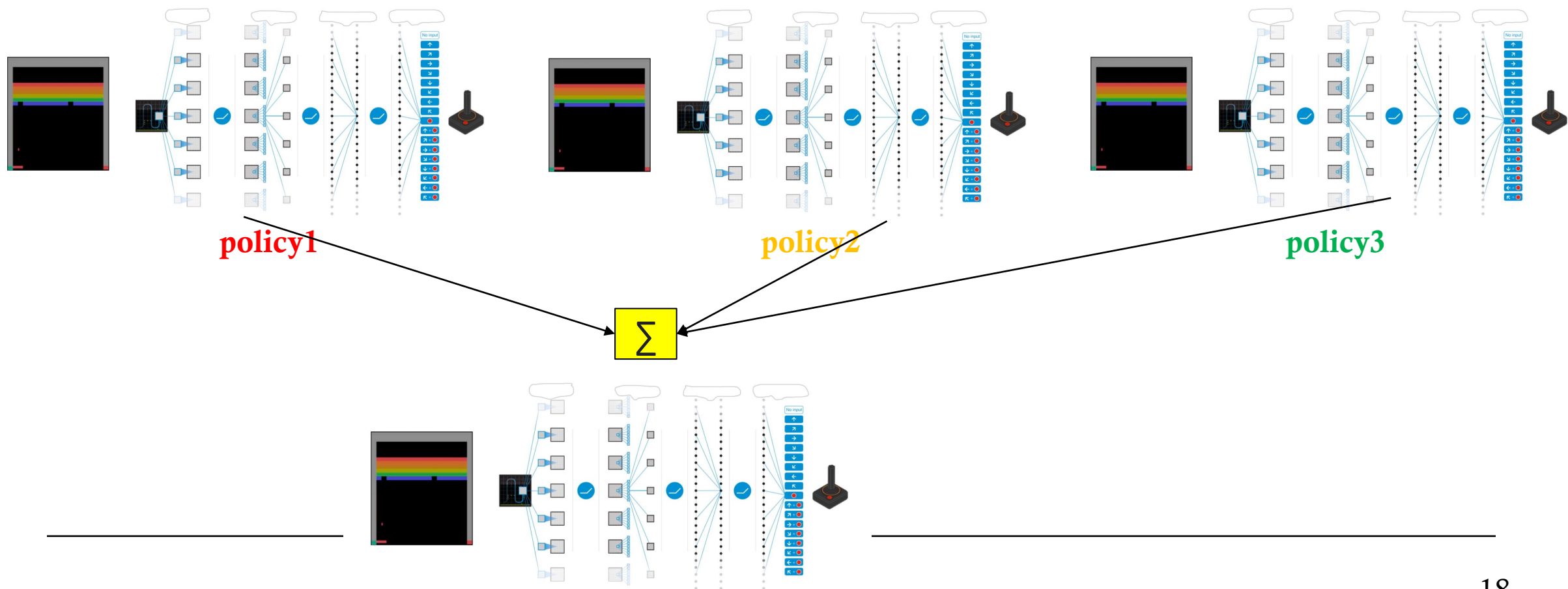


STACKING WITH SL - REGRESSION

A network diagram is constructed on a dark, textured wooden surface. It consists of approximately 12 brass-colored pins standing upright. These pins are interconnected by thin, translucent yellow-green threads. The threads form a complex web, with many lines radiating from a central point and others connecting various peripheral nodes. The background is a blurred view of the same wooden surface, suggesting a larger grid of pins.

STACKING WITH REINFORCEMENT LEARNING

STACKING WITH REINFORCEMENT LEARNING



CODE

- Stacking – SL.ipynb

```
mirror_mod = modifier_ob.  
set mirror object to mirror.  
mirror_mod.mirror_object  
operation == "MIRROR_X":  
mirror_mod.use_x = True  
mirror_mod.use_y = False  
mirror_mod.use_z = False  
operation == "MIRROR_Y":  
mirror_mod.use_x = False  
mirror_mod.use_y = True  
mirror_mod.use_z = False  
operation == "MIRROR_Z":  
mirror_mod.use_x = False  
mirror_mod.use_y = False  
mirror_mod.use_z = True  
  
selection at the end -add  
mirror_ob.select= 1  
modifier_ob.select=1  
context.scene.objects.active  
("Selected" + str(modifier_ob.  
mirror_ob.select = 0  
= bpy.context.selected_object  
data.objects[one.name].select  
  
print("please select exactly  
  
-- OPERATOR CLASSES ----  
  
types.Operator):  
X mirror to the selected  
object.mirror_mirror_x"  
mirror X"  
  
context):  
context.active_object is not
```

QUESTION & ANSWER

REFERENCE

- <https://www.analyticsvidhya.com/blog/2023/01/ensemble-learning-methods-bagging-boosting-and-stacking/>
- <https://machinelearningmastery.com/meta-learning-in-machine-learning/>
- https://commons.wikimedia.org/wiki/File:ML_dataset_training_validation_test_sets.png