



Classifying waste products

Stage 1: Defining the problem

Train a machine learning model that will predict whether a waste product should be placed in a biodegradable waste bin or another type of bin.



Image source: <https://www.un.org/sustainabledevelopment/news/communications-material>

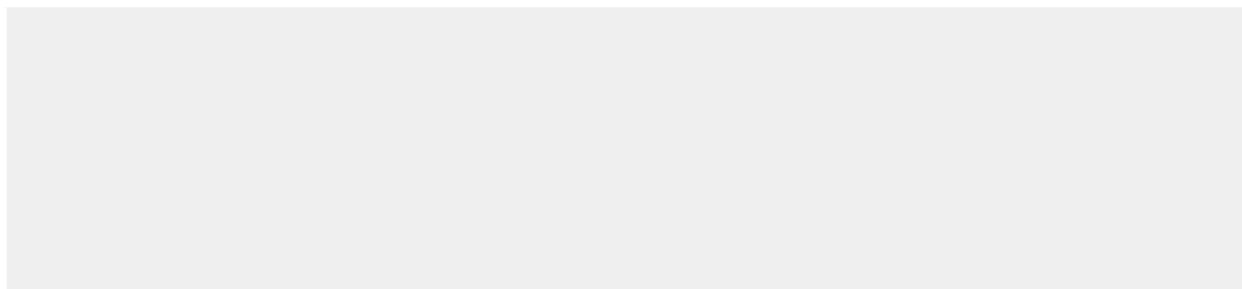
Use the table below to identify between one and four UN Sustainable Development Goals that you think this project will support, and justify your answers.

**UN Sustainable
Development Goal**

Justification

The use of machine learning

Describe in two or three sentences why creating a machine learning classification model is a suitable approach to solving this problem (your answer should describe why a data-driven, rather than rule-based, approach is needed).



Stage 2: Preparing the data

The data has been collected and cleaned for you. Below is a list of the features in the data:

Image, Organic?

You will be creating a classification model. Use the space below to plan what classes you will need.

Classes



Now you are ready for stage 3: training the model.

Stage 4: Testing the model

What should be the **threshold** confidence score for your model?
Give your answer as a percentage.

Use the test data on [this website](https://ai-activities.raspberrypi.org/waste-classification) (ai-activities.raspberrypi.org/waste-classification) to test your model. As you are doing this, keep a note of how many tests you have done and in how many of them the data was labelled correctly.

You can use this formula to work out accuracy:

$$\text{Accuracy} = \frac{\text{Number of correct predictions where threshold is met}}{\text{Total number of predictions}}$$

Multiply this number by 100 to express the accuracy of your model as a percentage.

Complete a minimum of 10 tests on your model and write down the accuracy below:

Accuracy =

Reflection

If your model does not have an accuracy of 100%, why do you think that is?

What could you do to improve your model (if 100% accuracy was not achieved)?

Explorer task

Return to your model and see if you can improve the accuracy.

New accuracy =

State the steps you took to achieve this accuracy.



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