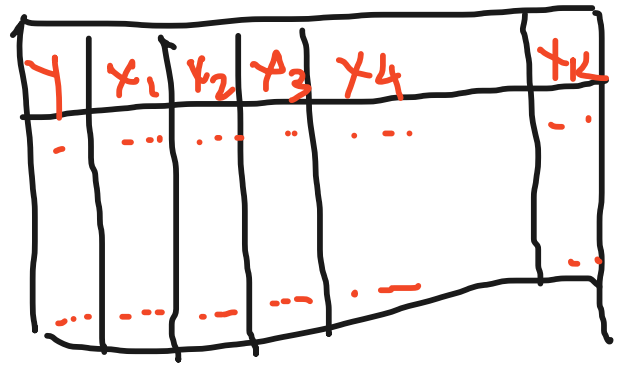
Feature Creation / Feature Engineering

For ML, data needs to be available as shown alongside



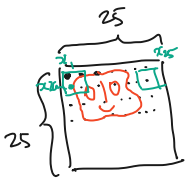
How to convert the following data in this format?

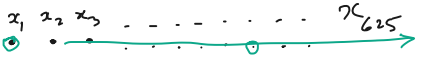
- Text
- Image
- Audio
- Video

In addition, there may be specific situations where data is not readily available in the form shown above.

In such situations, features have to be engineering as required by, and, in order to reflect the domain requirements ...

PREPARATORY STEPS → Image processing
→ Text processing.





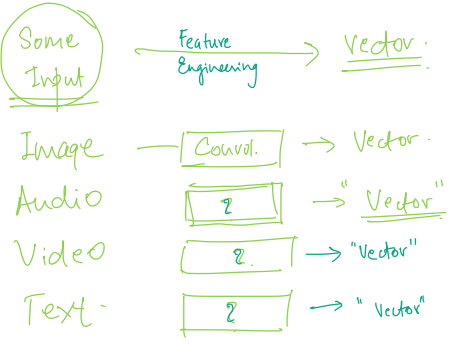
- While processing images (for ML purposes), the pixels can be laid end to end in order to create a **vector** of features
- However, this is a very naive method to create features from images - one which ignores the very basic relationships between pixels.
- Pixels in images may be related to other surrounding pixes (as shown above) and these relationships need to be incorporated while creating features from images for the purpose of ML

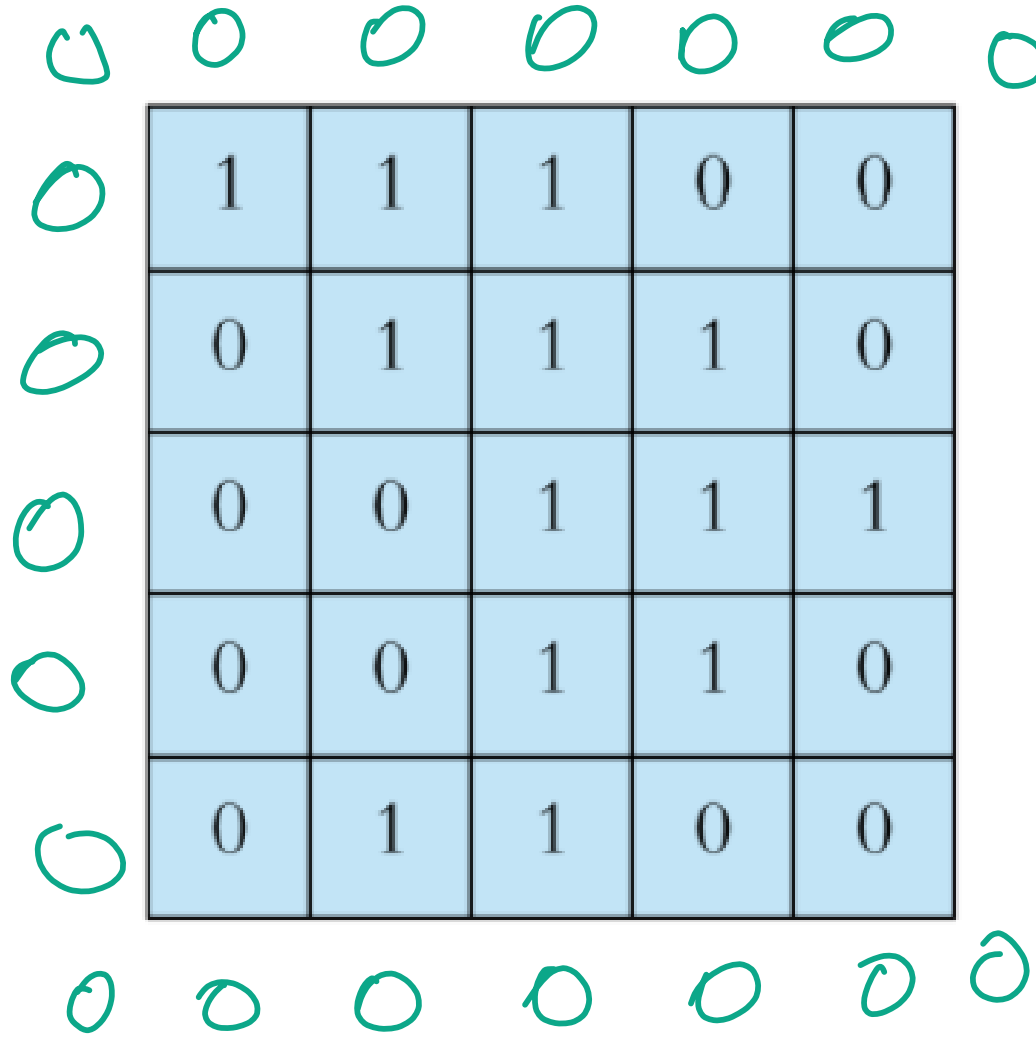
How to ensure that data, such as images and text, are ENRICHED with Contextual information?

How can Contextual & relevant features be created from audio data?

Each such data type requires the use of specific methods. For instance CONVOLUTIONS Constitute one such method - relevant to image data.

Convolutions help to understand images at various levels.

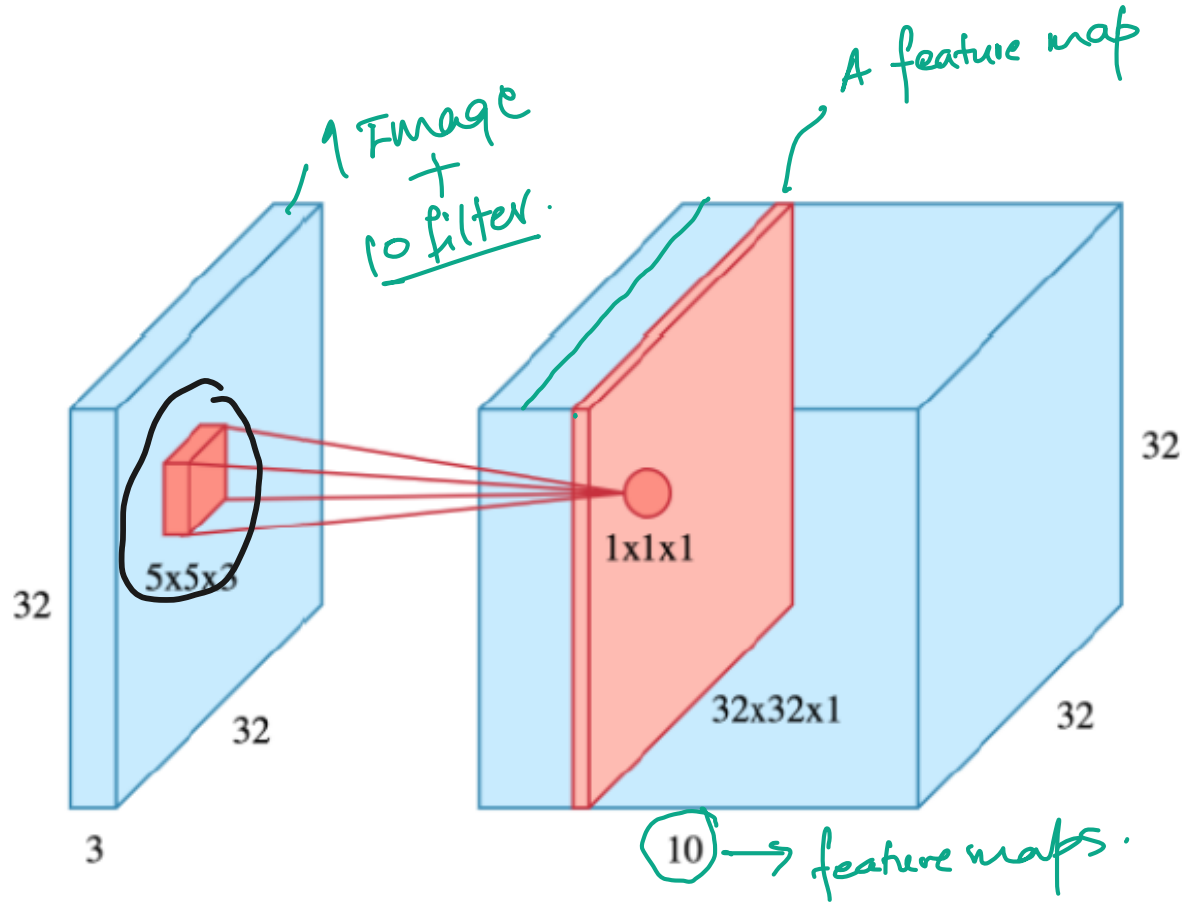




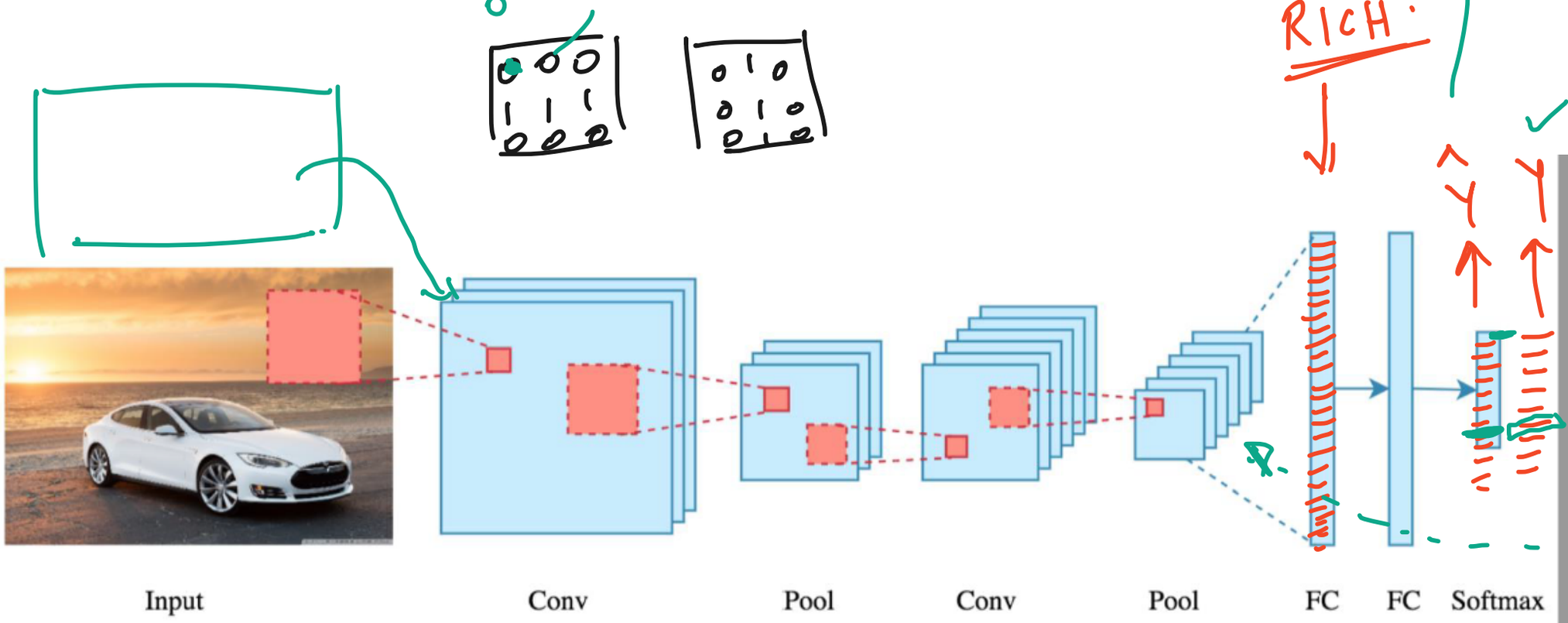
Convolutions

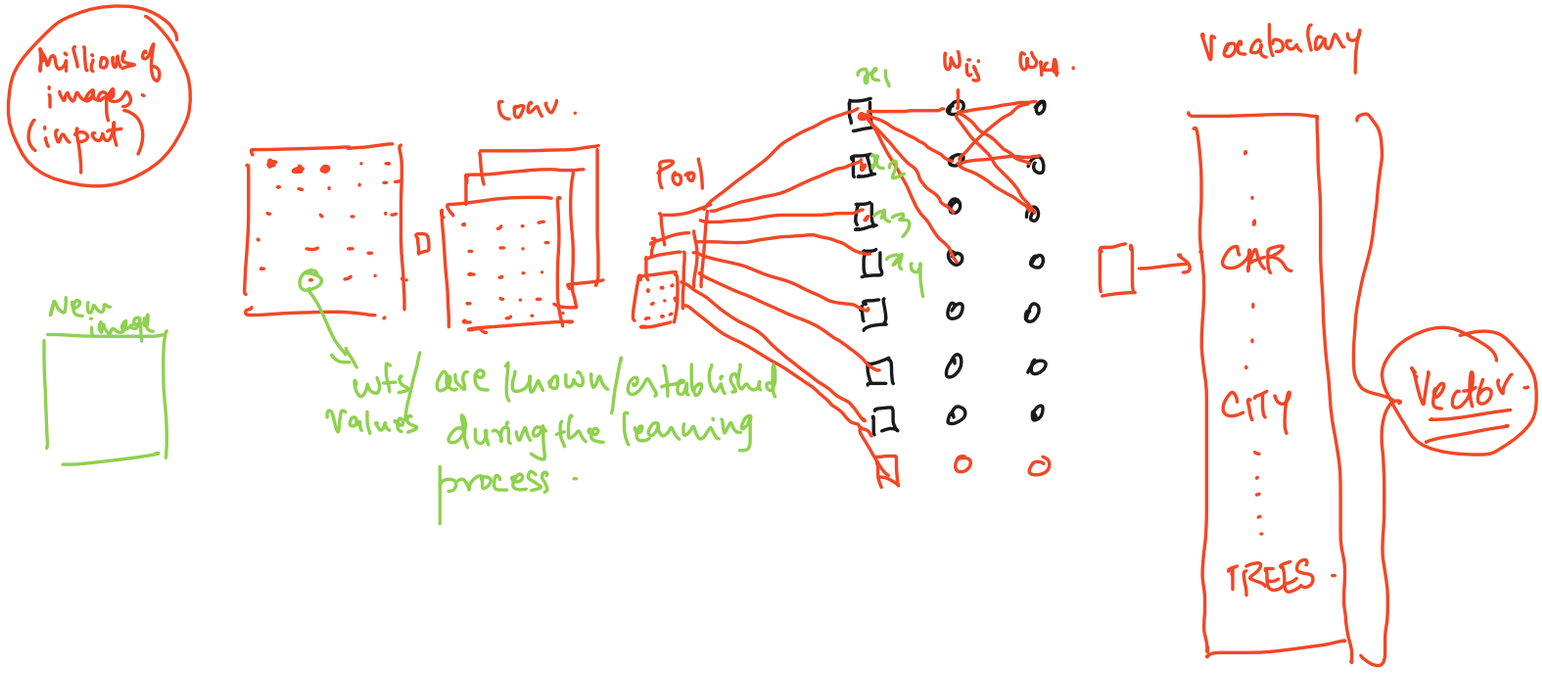
A mathematical operation that combines two functions to produce a third function

Convolutions are used in image processing to detect edges, extract features, apply filters, etc.



Refer to the separately uploaded presentation on CNNs


RICH.
Input
Conv
Pool
Conv
Pool
FC
FC
Softmax


Millions of images. (input)
New image
Conv.
Pool
wts/ values are known/established during the learning process.
Vocabulary
CAR
CITY
TREES
Vector