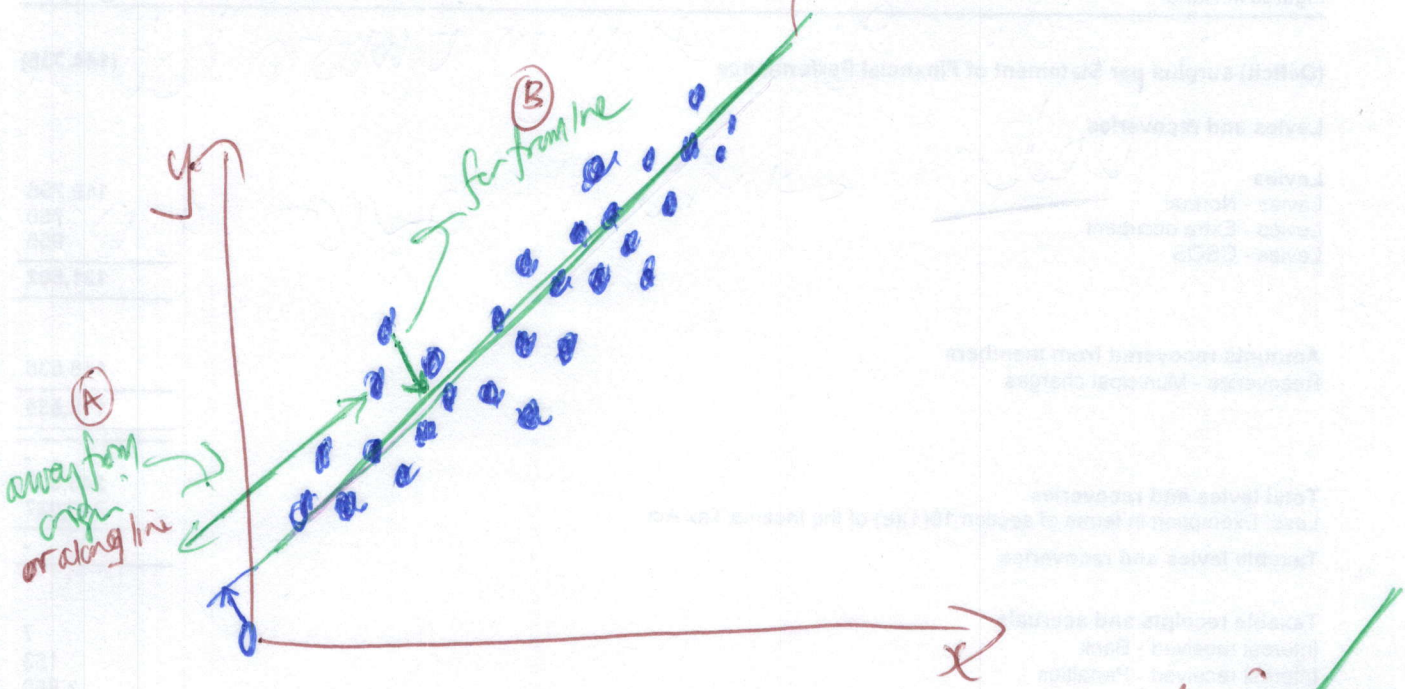
Vector Basis — Application — Example

- we have 2D data points



and they more less lie on straight line

- So we can decide the data by mapping it onto that line
- and say how 'far' (fit) they are on the line

∴ Now 2 Dimensions:

(A) → how far along the line

(B) → and how from the line

and all the other point are slightly different distance from line

how far from line (B) — really how noisy the data (land) is (from line) (it measure)

⇒ spread (big distance away)

⇒ narrow (small distance away)

distance from line ⇒ NOISE

But that NOISE Dim tells how good the line fit is

So 2 deductions:

⇒ along and away from line

→ that they are orthogonal from each other, so we can use the dot product to do the projection.

to map the data from x, y space
onto space of how on the line and
away from line

⇒ If we apply this to a neural network in ML. Not
recognise face
- we want to make some transformation
of all pixels in face for new
basis that describe nose shape,
skin hue, distance between eye,
and then discard the actual pixel data.

∴ goal of learning process of NN is to
somehow derive a set set of basis
vectors that extract the most
information rich features of face

Recap: [+ peroi Module]

- we talked about the dimentionality of vector space i.t.o the number of independent vector space that it has
- we found a test for independence
- and what that means i.t.o. mapping from one space to another.
- and how its going to be useful in DataScie