PCA(Principal Component Analysis)

↓

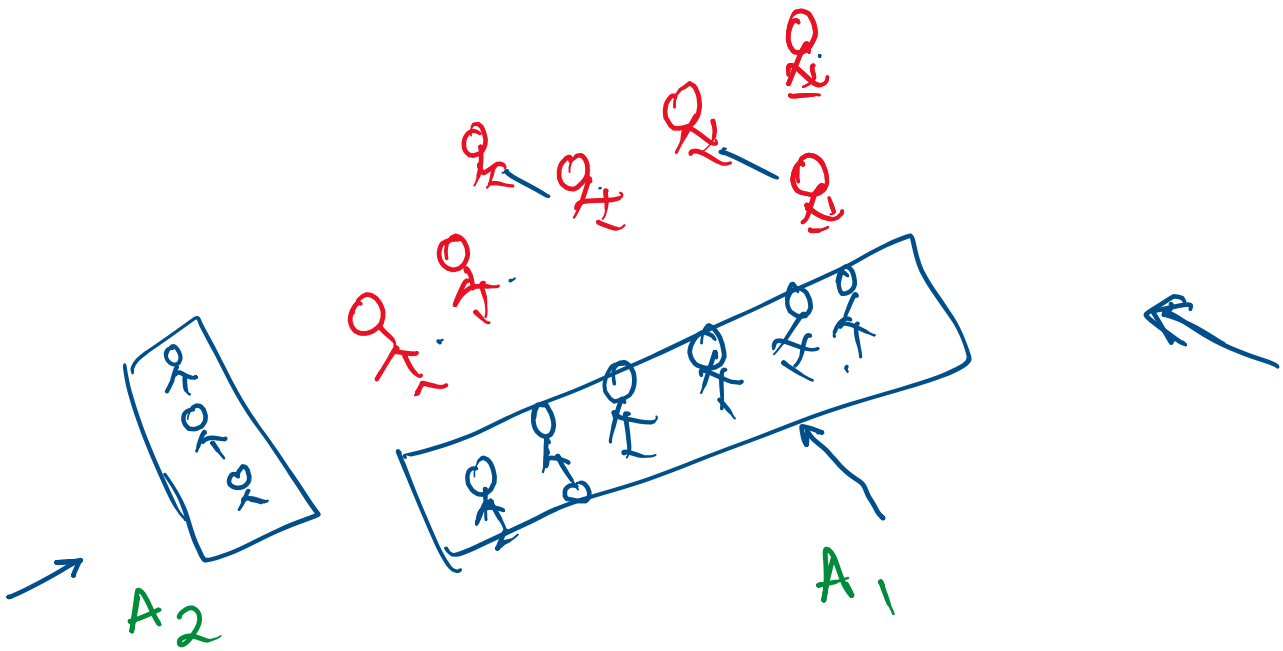
Dimensionality Reduction

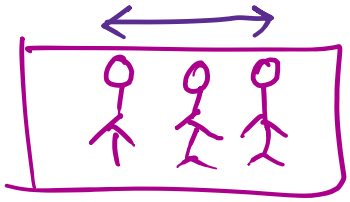
↓ ↓

Dimensions Reducing, making smaller.

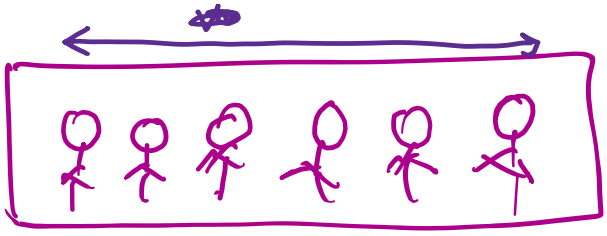
100 feat ⟶ 5, 6, 7 feat

Example :-





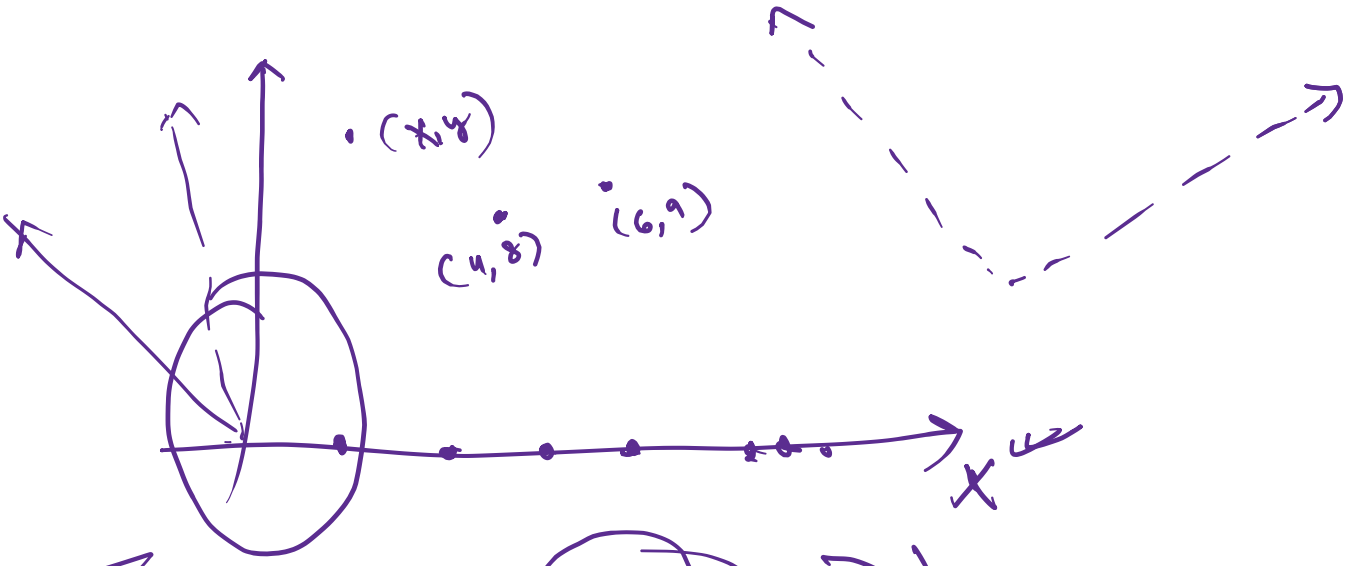
A-2

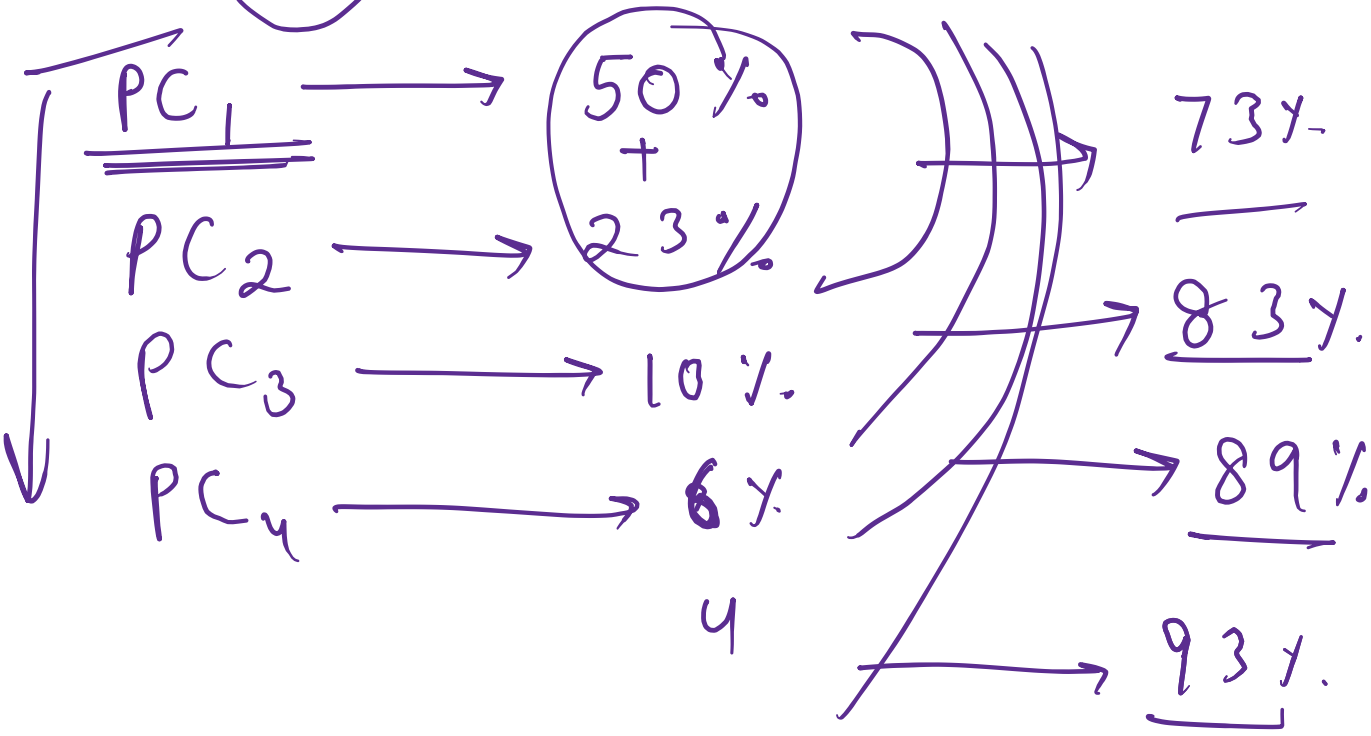


A-1

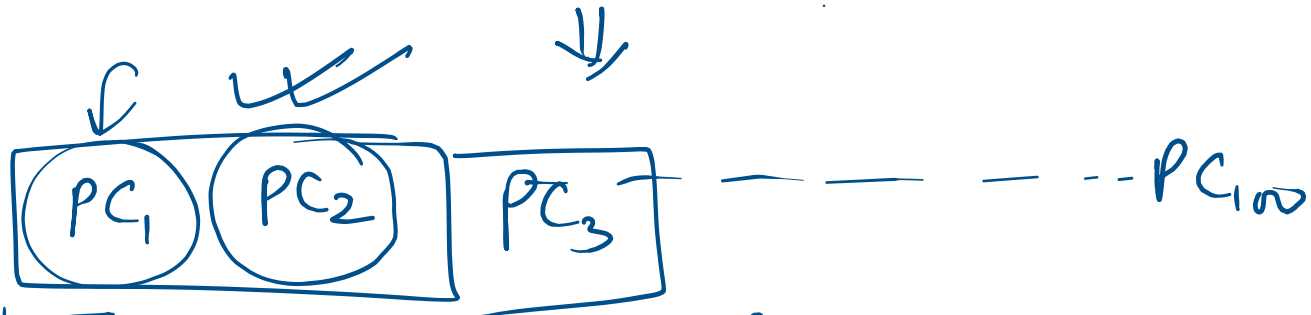
variability ↓

variability ↑





X_1 X_2 X_3 ---------- X_{100} Y



73% | 53% 20% 10% 6

83%

89

100% → 100

80%

Co-variance matrix.

Cov(x,x)	Cov(x,y)
Cov(y,x)	Cov(y,y)

$2(xi + yj)$

$8(x_i + y_j)$

steps-

1. Import data
2. standardise & Cov. matrix.
3. Eigen value & Eigen vector.

↓ Scaling factor

↓ dir^n of max^m variability.

(4) Define PC → dot product
or
→ Eigen vector & standardise column.

Ref:-

dot product = $|A| \, |B| \cos\theta$

$\vec{A} \cdot \vec{B}$

→ 0°

→ 1

0.07   0.10,   0.20   - - - - - -   100%

→ PC$_1$ → max^m variability.

PC$_2$ - → 2nd max.

PC$_3$ → 3rd max

⋮

EOF >>