

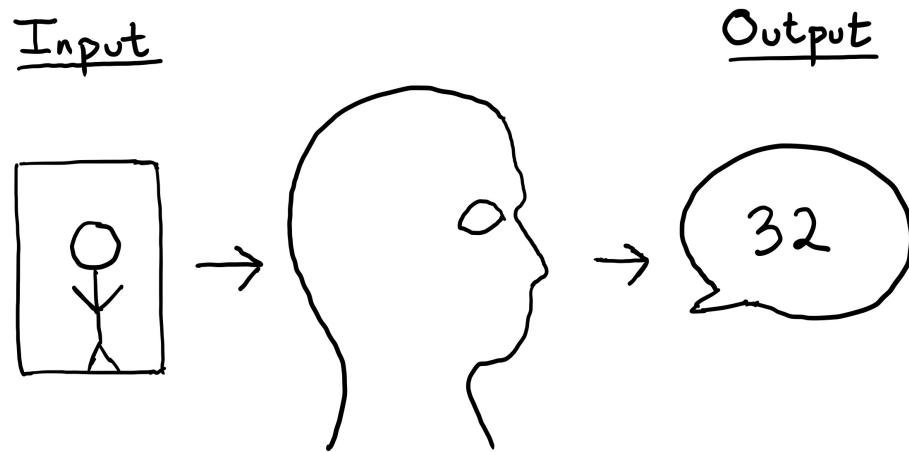
Protocols: examples?

Results



Group	A	B	C	D	E	F	G	H	I	J
1	24	20.0	58.0	41.0	28.0	23.0	30.0	39.0	54.0	46.0
2	32	26.0	64.0	38.0	31.0	26.0	32.0	32.0	49.0	45.0
3	25	22.5	57.5	36.5	31.5	23.5	28.5	31.5	51.5	51.5
4	30	20.0	58.0	40.0	30.0	25.0	25.0	30.0	45.0	50.0
5	30	18.0	58.0	34.0	30.0	26.0	29.0	37.0	48.0	38.0

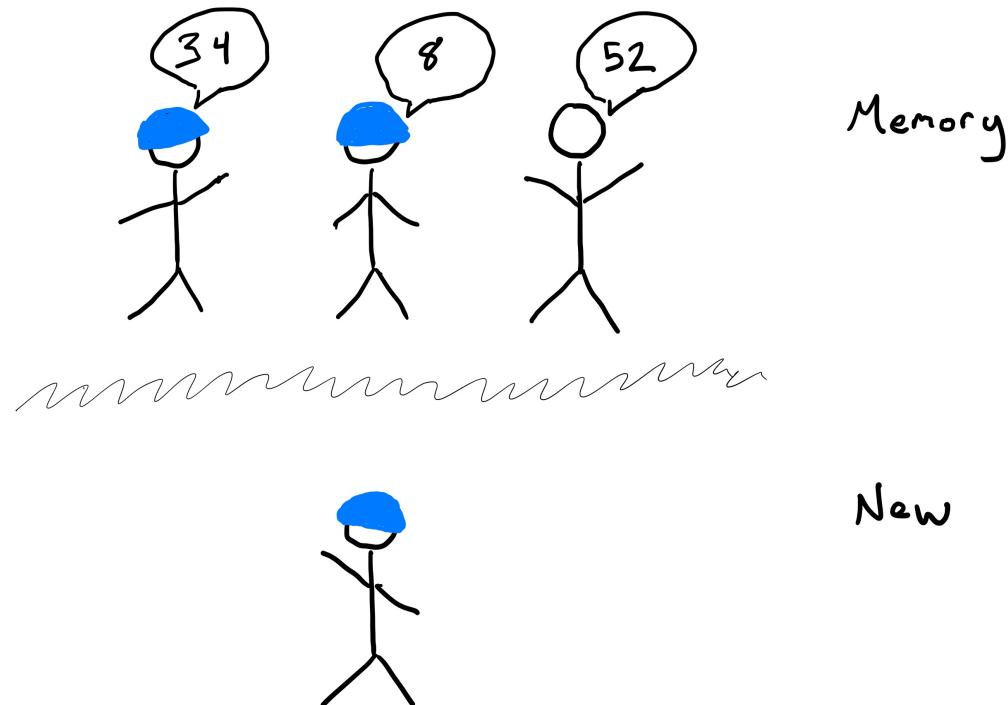
Predictive Modeling as a Human



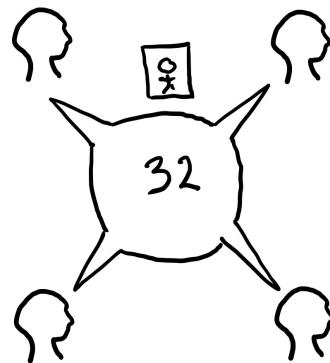
What features do you look for?



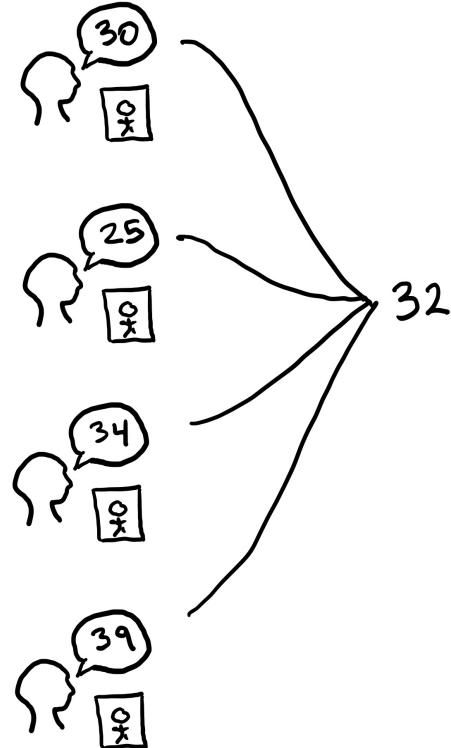
Training Humans



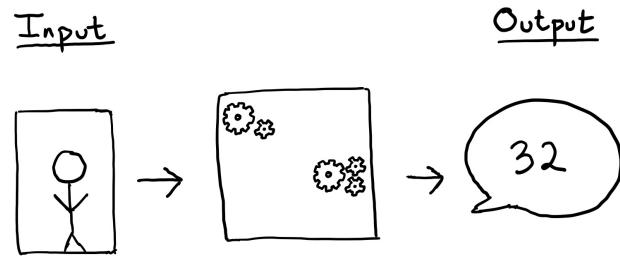
Human Decision-Making



vs.



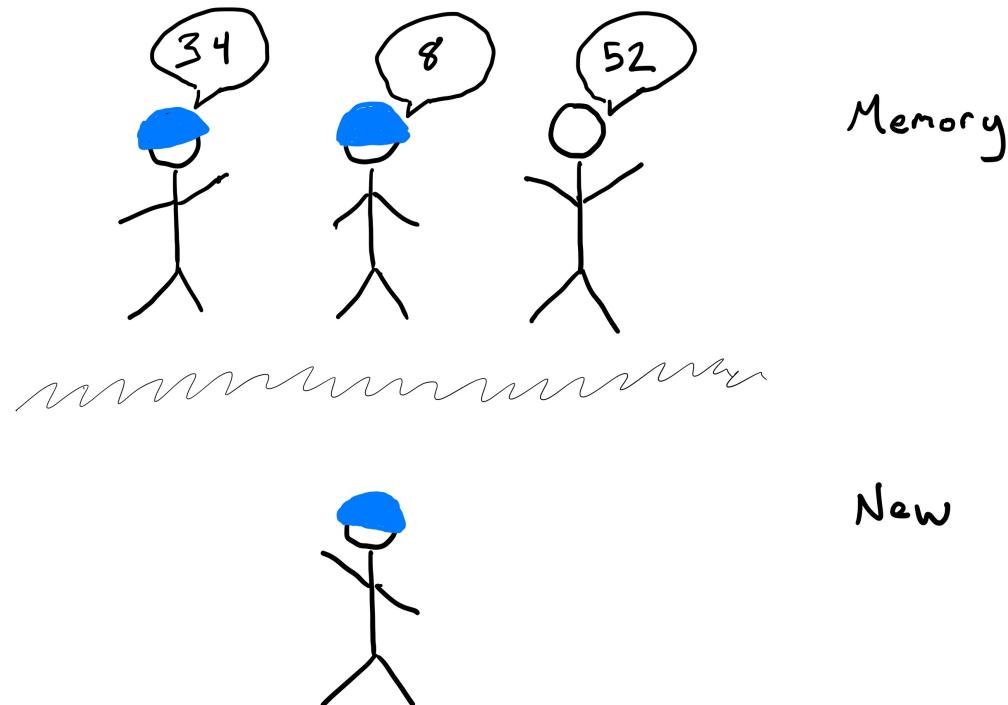
Predictive Modeling as a Machine



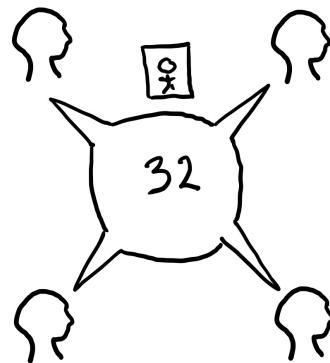
$$x_A \in [0, 255] \rightarrow \begin{matrix} \square & \square & \square \\ \square & \square & \square \\ \square & \square & \square \\ \square & \square & \square \end{matrix} \rightarrow x_A = \begin{pmatrix} x_{A1} \\ x_{A2} \\ \vdots \\ x_{Ab} \end{pmatrix} \longrightarrow x'_A = \begin{pmatrix} x'_{A1} \\ x'_{A2} \\ x'_{A3} \end{pmatrix} \rightarrow \hat{y}_A$$

Selecting \hat{f}

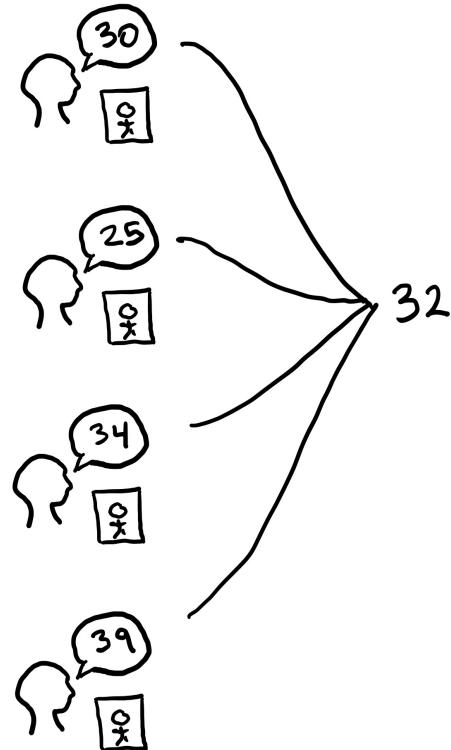
Training a Machine



Machine Decision-Making

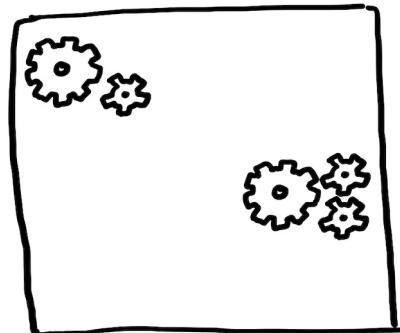


vs.



In this course

We will open up the machines.



Some recurring themes

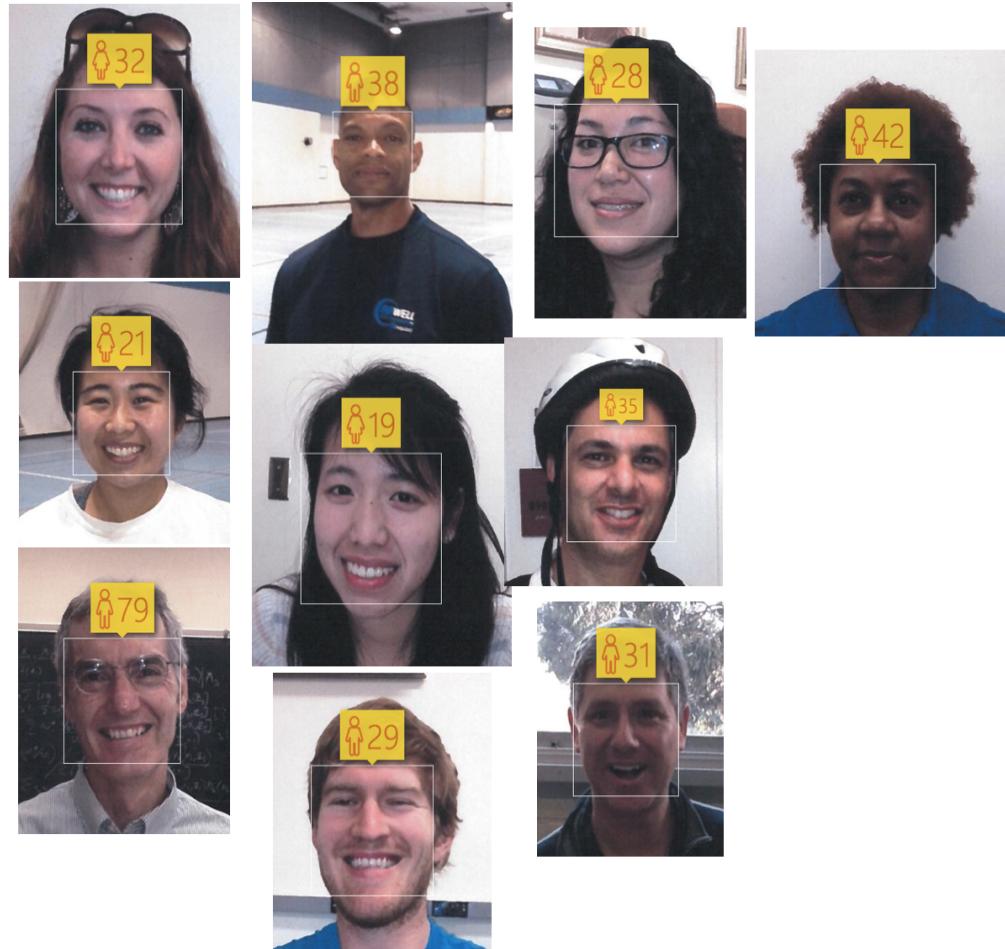
1. Raw data may be messy / uninformative
2. Feature extraction
3. Many choices for \hat{f} !
4. Learning with ensembles
5. Must be thoughtful about model assessment

Results



Group	A	B	C	D	E	F	G	H	I	J
1	24	20.0	58.0	41.0	28.0	23.0	30.0	39.0	54.0	46.0
2	32	26.0	64.0	38.0	31.0	26.0	32.0	32.0	49.0	45.0
3	25	22.5	57.5	36.5	31.5	23.5	28.5	31.5	51.5	51.5
4	30	20.0	58.0	40.0	30.0	25.0	25.0	30.0	45.0	50.0
5	30	18.0	58.0	34.0	30.0	26.0	29.0	37.0	48.0	38.0
actual	23	26.0	58.0	51.0	27.0	25.0	22.0	43.0	47.0	61.0

www.how-old.net



Results



Group	A	B	C	D	E	F	G	H	I	J
1	24	20.0	58.0	41.0	28.0	23.0	30.0	39.0	54.0	46.0
2	32	26.0	64.0	38.0	31.0	26.0	32.0	32.0	49.0	45.0
3	25	22.5	57.5	36.5	31.5	23.5	28.5	31.5	51.5	51.5
4	30	20.0	58.0	40.0	30.0	25.0	25.0	30.0	45.0	50.0
5	30	18.0	58.0	34.0	30.0	26.0	29.0	37.0	48.0	38.0
actual	23	26.0	58.0	51.0	27.0	25.0	22.0	43.0	47.0	61.0
howold	32	21.0	79.0	38.0	19.0	29.0	28.0	35.0	31.0	42.0

Results



Group	A	B	C	D	E	F	G	H	I	J	MSE
1	24	20.0	58.0	41.0	28.0	23.0	30.0	39.0	54.0	46.0	49.60
2	32	26.0	64.0	38.0	31.0	26.0	32.0	32.0	49.0	45.0	78.40
3	25	22.5	57.5	36.5	31.5	23.5	28.5	31.5	51.5	51.5	53.42
4	30	20.0	58.0	40.0	30.0	25.0	25.0	30.0	45.0	50.0	51.80
5	30	18.0	58.0	34.0	30.0	26.0	29.0	37.0	48.0	38.0	102.70
howold	32	21.0	79.0	38.0	19.0	29.0	28.0	35.0	31.0	42.0	151.30
actual	23	26.0	58.0	51.0	27.0	25.0	22.0	43.0	47.0	61.0	0.00