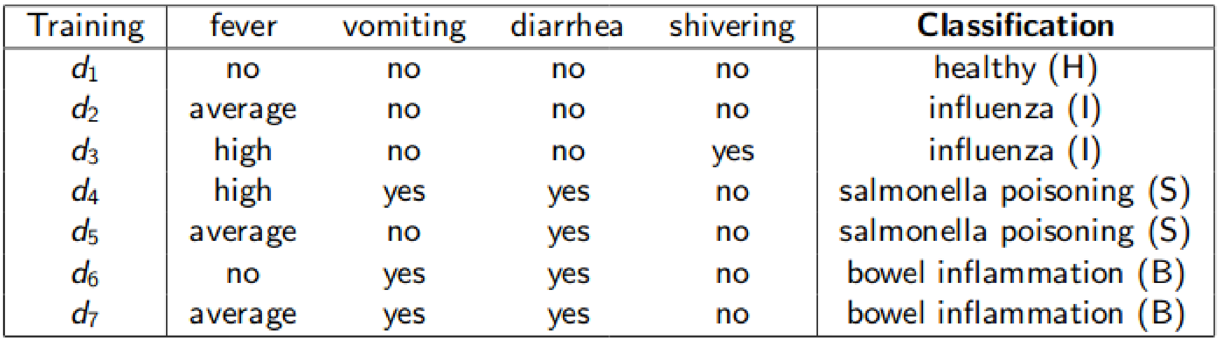
Exercise: Entropy

Table 1 shows the values of annotated variables for some patients. Calculate the entropy for all pairs of variables, excluding the identifiers (d*).

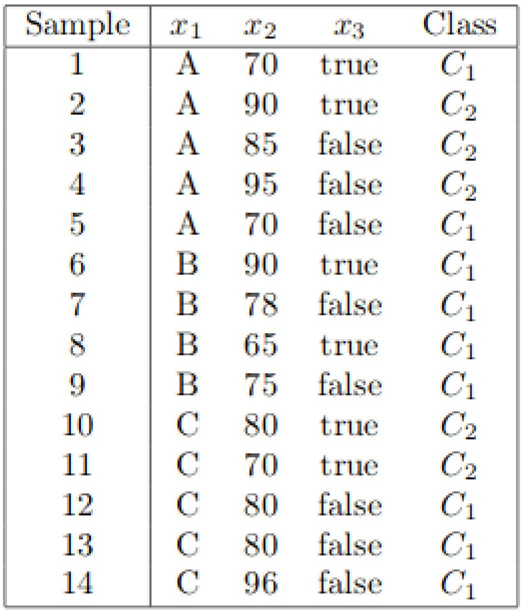


Training	fever	vomiting	diarrhea	shivering	**Classification**
d_1	no	no	no	no	healthy (H)
d_2	average	no	no	no	influenza (I)
d_3	high	no	no	yes	influenza (I)
d_4	high	yes	yes	no	salmonella poisoning (S)
d_5	average	no	yes	no	salmonella poisoning (S)
d_6	no	yes	yes	no	bowel inflammation (B)
d_7	average	yes	yes	no	bowel inflammation (B)

Table 1: Annotated variables for patients

According to the entropy values calculated, which is the best variable to predict if a person is healthy or not?

Table 2 shows other set of data where one of the variables (x2) is numerical. How would you calculate entropy in this context (it is not allowed to consider each one of the numerical values as a unique value)?



Sample	x_1	x_2	x_3	Class
1	A	70	true	C_1
2	A	90	true	C_2
3	A	85	false	C_2
4	A	95	false	C_2
5	A	70	false	C_1
6	B	90	true	C_1
7	B	78	false	C_1
8	B	65	true	C_1
9	B	75	false	C_1
10	C	80	true	C_2
11	C	70	true	C_2
12	C	80	false	C_1
13	C	80	false	C_1
14	C	96	false	C_1

Table 2: Annotated variables for some observations