




Hypothesis space

Example: Where are we going to spend our Christmas holiday?

Choices

1. Thailand
2. Australia
3. Norway

Features

1. Flight ticket price (x1)
2. Hotel price (x2)
3. Coronavirus situation (x3)

Labels – Go or not go

0. Not go
1. Go

Hypothesis mapping h(x)

Places	Features						
	X1	X2	X3	X4	X5	X6	…
1	11	21	31	41	51	61	…
2	12	22	32	42	52	62	…
3	13	23	33	43	53	63	…
4	14	24	34	44	54	64	…
5	15	25	35	45	55	65	…
…..	…	…	…	…	…	…	….

Hypothesis h(x) / predictor label mapping(y_hat)
Hypothesis space (H)

- Hypothesis / predictor label mapping is a function that can explain the relationship between x and y for its all possible hypothesis.

- Hypothesis space is restricted subset of the large hypothesis / predictor label mapping.

Hypothesis space (H)

Is the restricted subset of all possible (large) hypothesis

	X1 Flight ticket	X2 Hotel price	X3 Coronavirus situation
1. Thailand	1000	500	0.8
2. Australia	2000	1000	0.5
3. Norway	500	1000	0.3

Labels

– go or not go

- “0” – not go
- “1” – go

$h(x) \approx y$

- Our goal is to find the optimal predictor/hypothesis $h(x) \approx y$.
- There is only one optimal predictor in this case, which is inside the hypothesis space (H).
- Loss / error function can be used to measure the quality of hypothesis $h(x) \approx y$.

Explanation:

- In this case, there are many features could affect itinerary, such as special job requirement, the health of children...
- More features chosen means that hypothesis map is getting larger.
- The hypothesis space of this mapping is small enough to fit the resources. We restricted our hypothesis mapping by selecting 3 most influenced features: flight tickets price, hotel price, and coronavirus situation, and 3 most wished places - Thailand, Australia and Norway.
- The hypothesis space of this mapping is also large enough to provide information for decision making.

ThankYou

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