

#### 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  | Х3  | 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)



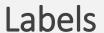
• Hypothesis / predictor label mapping is a function that can explain the relationship between x and y for its all possible hypothesis.

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

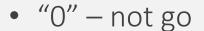
### Hypothesis space (H)

Is the restricted subset of all possible (large) hypothesis

|                 | X1<br>Flight<br>ticket | X2<br>Hotel price | X3<br>Coronaviru<br>s situation |
|-----------------|------------------------|-------------------|---------------------------------|
| 1.<br>Thailand  | 1000                   | 500               | 0.8                             |
| 2.<br>Australia | 2000                   | 1000              | 0.5                             |
| 3.<br>Norway    | 500                    | 1000              | 0.3                             |









## h(x)≈y

- Our goal is to find the optimal predictor/hypothesis h(x) ≈ 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) ≈ 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.



