Supplement of conditional probability

1. Probability space

Consider a partitioned set

and

1. The intersection( or joint) probability as

Probability table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | sunny | rainy | foggy |  |
|  | happy | 0.5 | 0.05 | 0.05 | 0.6 |
|  | sad | 0.2 | 0.15 | 0.05 | 0.4 |
|  |  | 0.7 | 0.2 | 0.1 |  |

1. Check the legitimacy
2. Conditional probability

* You measure the weather condition to infer your mind
* You are confined in the room not to see outside. If you are happy. Predict the weather
* Check the legitimacy on the marginal probability

%% Kim’s comment :

Bayesian rule is very important nowadays. It is indispensable in ML. We should be familiar to this rule.

The interpretation may be

* Given B , the prob of A == the prob of A measured B == after measured B estimate A

== posterior probability

* P(A) : the original event of A == prior probabilaity
* Since

It is a marginal prob. It is constant w.r.t. event A i.e., the sunny prob.

* may be called the conditional marginal prob. i.e., it is a marginal regarding “B” conditioning