

The two examples are shown below:

**Example 1:**

For prediction that is well Separated but not sufficient:

We have  $P(\text{Vegetable} \mid \text{Hyperlipidemia, BMI})$ :

The probability is shown below:

$$P(\text{Vegetable} = <400\text{g/d} \mid \text{Hyperlipidemia, BMI}) = 0.579$$

$$P(\text{Vegetable} = 400-500\text{g/d} \mid \text{Hyperlipidemia, BMI}) = 0.284$$

$$P(\text{Vegetable} = >500\text{g/d} \mid \text{Hyperlipidemia, BMI}) = 0.137$$

$$P(\text{Vegetable} = <400\text{g/d} \mid \text{Hyperlipidemia}) = 0.579$$

$$P(\text{Vegetable} = 400-500\text{g/d} \mid \text{Hyperlipidemia}) = 0.284$$

$$P(\text{Vegetable} = >500\text{g/d} \mid \text{Hyperlipidemia}) = 0.137$$

Hence the example is well separated

$$P(\text{Hyperlipidemia} \mid \text{Vegetable} = <400\text{g/d, BMI}) = \text{Yes: } 0.3599, \text{ No: } 0.64$$

$$P(\text{Hyperlipidemia} \mid \text{Vegetable} = 400-500\text{g/d, BMI}) = \text{Yes: } 0.1941, \text{ No: } 0.8058$$

$$P(\text{Hyperlipidemia} \mid \text{Vegetable} = >500\text{g/d, BMI}) = \text{Yes: } 0.0874, \text{ No: } 0.9125$$

$$P(\text{Hyperlipidemia} \mid \text{Vegetable} = <400\text{g/d}) = \text{Yes: } 0.5821, \text{ No: } 0.4178$$

$$P(\text{Hyperlipidemia} \mid \text{Vegetable} = 400-500\text{g/d}) = \text{Yes: } 0.3737, \text{ No: } 0.6262$$

$$P(\text{Hyperlipidemia} \mid \text{Vegetable} = >500\text{g/d}) = \text{Yes: } 0.1918, \text{ No: } 0.8081$$

Hence the example is not sufficient

**Example 2:**

For prediction that is sufficient but not well separated:

We have  $P(\text{CentralObesity} \mid \text{Hyperlipidemia, Gender})$ :

The probability table is shown below:

$$P(\text{CentralObesity} \mid \text{Hyperlipidemia} = \text{Yes, Gender}) = \text{Yes: } 0.7876, \text{ No: } 0.2123$$

$$P(\text{CentralObesity} \mid \text{Hyperlipidemia} = \text{No, Gender}) = \text{Yes: } 0.5832, \text{ No: } 0.4167$$

$$P(\text{CentralObesity} \mid \text{Hyperlipidemia} = \text{Yes}) = \text{Yes: } 0.7876, \text{ No: } 0.2123$$

$$P(\text{CentralObesity} \mid \text{Hyperlipidemia} = \text{No}) = \text{Yes: } 0.5832, \text{ No: } 0.4167$$

Hence this example is sufficient

$P(\text{Hyperlipidemia} = \text{Yes} \mid \text{CentralObesity}, \text{Gender}) = 0.5152$

$P(\text{Hyperlipidemia} = \text{No} \mid \text{CentralObesity}, \text{Gender}) = 0.4847$

$P(\text{Hyperlipidemia} = \text{Yes} \mid \text{CentralObesity}) = 0.4790$

$P(\text{Hyperlipidemia} = \text{No} \mid \text{CentralObesity}) = 0.5209$

Hence this example is not well separated