# Bayes Theorem Example

**Question** Given the below dataset of cricketers find out the probability of the last person to be whether a cricketer or not.

|  |  |  |  |
| --- | --- | --- | --- |
| **Smokes** | **Drinks** | **Runs** | **Cricketer** |
| YES | YES | NO | YES |
| YES | NO | YES | NO |
| NO | YES | NO | YES |
| NO | NO | YES | YES |
| YES | YES | NO | YES |
| NO | NO | YES | NO |
| NO | YES | YES | NO |
| YES | YES | YES | YES |
| NO | NO | NO | NO |
| YES | YES | YES | YES |
| NO | YES | NO | ?? |

Now we create table as follows:

We compute conditional probabilities as

|  |
| --- |
| P(Character | Cricketer) |
| P(Character | Not Cricketer) |
| P(Not Character | Cricketer) |
| P(Not Character | Not Cricketer) |

Where Character is in [‘Smokes’, ‘Drinks’, ‘Runs’]

For example = 4/6. Thus if we compute all of them gives the following table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **Characters** | | |
|  |  | **Smokes** | **Drinks** | **Runs** |
| **Probabilities** | **P(Character | Cricketer)** | 0.666667 | 0.833333 | 0.5 |
| **P(Character | Not Cricketer)** | 0.25 | 0.25 | 0.75 |
| **P(Not Character | Cricketer)** | 0.333333 | 0.166667 | 0.5 |
| **P(Not Character | Not Cricketer)** | 0.75 | 0.75 | 0.25 |

Thus to predict the last person’s probability we compute

By Baye’s theorem:

Similarly

Thus