Gini Impurity of the Root Node

$$= 1 - (P_0)^2 - (P_1)^2$$

$$= 1 - (34/80)^2 - (46/80)^2$$

$$= 0.4888$$

Sample Data = [34, 46] → [Class 0, Class 1]

If we consider Delivery Number < 2 ?

$$YES → [19, 22]$$

$$NO → [15, 24]$$

GI of YES Node = 0.4973

GI of NO Node = 0.4734

Sum of Weighted Gini Impurity (WGI)

$$= 0.4973 \times \frac{41}{80} + 0.4734 \times \frac{39}{80}$$

$$= 0.4856$$

Delivery Time < 1?

$$YES → [16, 30]$$

$$NO → [18, 16]$$

GI of YES = 0.4537

GI of NO = 0.4983

Sum of W.G.I = 0.4727

Blood Pressure < 1 ?

$$YES → [5, 15]$$

$$NO → [32, 28]$$

GI of YES = 0.375

GI of NO = 0.4978

SUM of WGI = 0.4671

Heart Problem < 0.5 ? 1?

$\quad\quad$ YES → [28, 22]

$\quad\quad$ NO → [6, 24]

$\quad\quad$ GI of YES = 0.4928

$\quad\quad\quad$ GI of No = 0.32

$\quad\quad$ SUM of WGI = 0.428

SUM of WGI is smallest for Heart Problem question.
So, I will use this as criteria in Root Node.

Heart Prob < 1?
[34, 46]
GI = 0.4888

YES
11
[28, 22]
GI. = 0.4928

NO
12
[6, 24]
GI. = 0.22
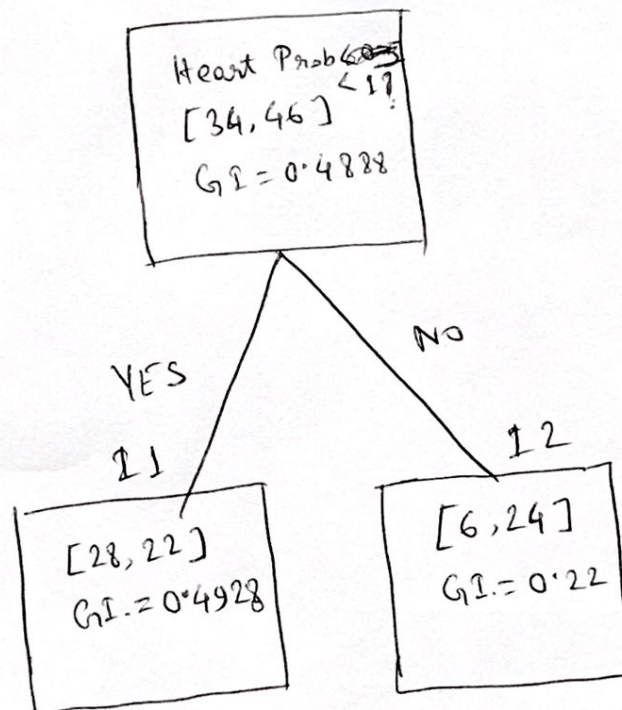
For Node I1 :—

Delivery Number < 2 ?

    YES → [17, 12]

    NO → [11, 10]

    GI of YES = 0.4851

    GI of NO = 0.4989

    SUM of WGI = 0.4909

Delivery Time < 1 ?

    YES → [13, 15]

    NO → [15, 7]

    GI of YES = 0.4974

    GI of NO = 0.4339

    SUM of WGI = ~~0.4955 0.4695~~

             0.4695

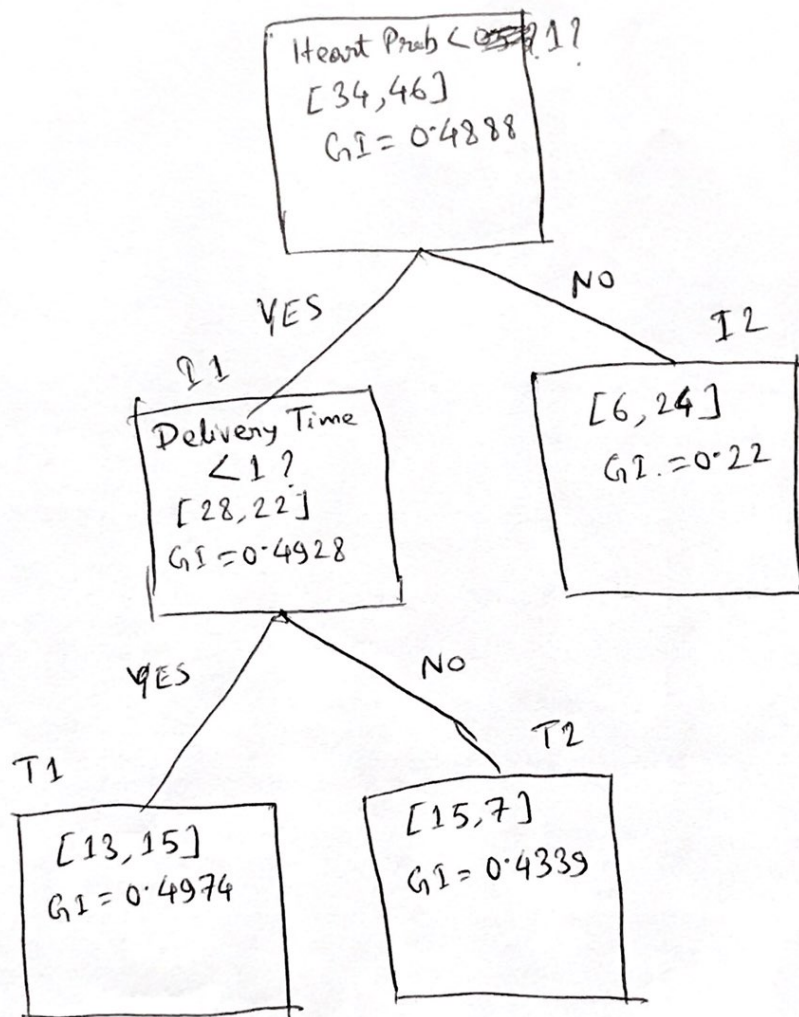Blood Pressure < 1 ?

    YES → [5, 6]

    NO → [23, 16]

    GI of YES = 0.4959

    GI of NO = 0.4839

    SUM of WGI = 0.4865

SGI of Delivery Time is smallest

Heart Prob < 0.1?
[34,46]
GI = 0.4888

YES

NO

I1

Delivery Time
< 1?
[28,22]
GI = 0.4928

I2

[6,24]
GI. = 0.22

YES

NO

T1

[13,15]
GI = 0.4974

T2

[15,7]
GI = 0.4339

For Node I2 :—

Delivery Num < 2 ?

    YES ⟶ [2, 10]

    NO → [4, 14]

    GI of YES = 0.2778

    GI of NO = 0.3457

    SUM OF WGI = 0.3185

Blood Pressure < 1 ?

    YES → [~~5,6~~]   [9, 0]

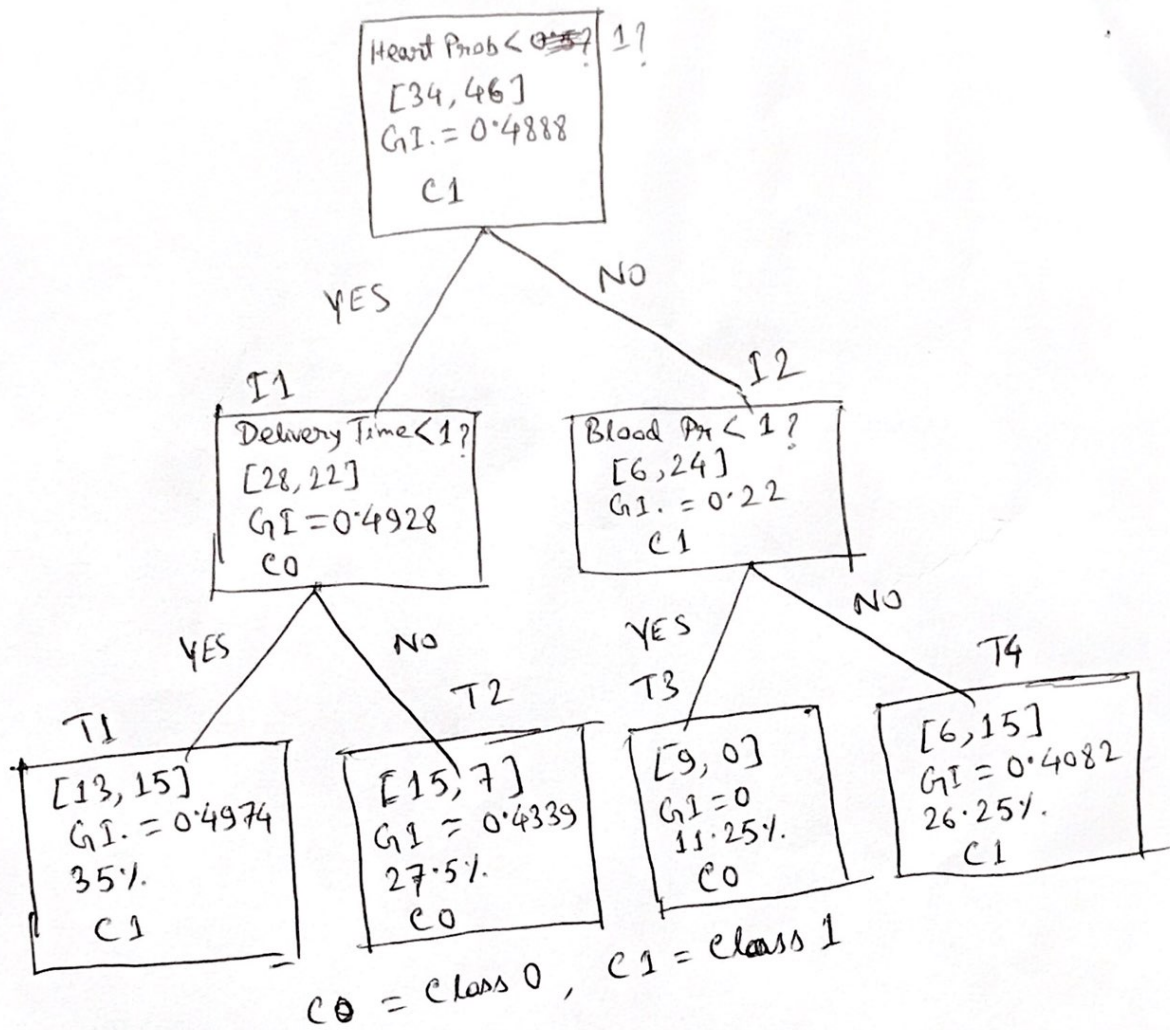   NO → [~~23,16~~] [6, 15]

    GI of YES = ~~0.4959~~ 0

    GI of NO = ~~0.4733~~ 0.4082

    SUM of WGI = 0.2857

So, for I2, I will use Blood Pressure as this has ~~lowest~~
lowest WGI.

Heart Prob < ~~0~~ 1?
[34, 46]
G.I. = 0.4888
C1

YES — I1
NO — I2

I1
Delivery Time < 1?
[28, 22]
G.I = 0.4928
C0

I2
Blood Pr < 1?
[6, 24]
G.I. = 0.22
C1

YES — T1
NO — T2
YES — T3
NO — T4

T1
[13, 15]
G.I. = 0.4974
35%
C1

T2
[15, 7]
G.I = 0.4339
27.5%
C0

T3
[9, 0]
G.I = 0
11.25%
C0

T4
[6, 15]
G.I = 0.4082
26.25%
C1

C0 = Class 0, C1 = Class 1

Rules:

If Heart Problem < ~~0.5~~ 1 AND Delivery Time < 1 ~~AND~~ then C1

If Heart Problem < ~~0.5 100~~ 1 and Delivery Time >= 1
then C0

If Heart Problem >= ~~0.5~~ 1 AND Blood Pressure < 1,
then C0

If Heart Problem >= ~~0.5~~ 1 AND Blood Pressure >= 1,
then C1