CHAPTER 4

ANALYSIS AND DESIGN

4.1 Analysis

4.1.1 Collecting Data

The data used to perform calculations is part of the data that will be calculated using the C.45 algorithm as a whole. For example, the data used is 15 data.

Table 1.1 : Training Data Example

Branch	City	Customer type	Gender	Product line	Unit price	Quantity	Tax 5%	Total	Date	Payment	cogs	gross income	Rating
A	Yangon	Member	Female	Health and beauty	74.69	7	26.14	548.97	1/5/2019	Ewallet	522.83	26.14	9.1
C	Naypyitaw	Normal	Female	Electronic accessories	15.28	5	3.82	80.22	3/8/2019	Cash	76.4	3.82	9.6
A	Yangon	Normal	Male	Home and lifestyle	46.33	7	16.22	340.53	3/3/2019	Credit card	324.31	16.22	7.4
A	Yangon	Member	Male	Health and beauty	58.22	8	23.29	489.05	1/27/2019	Ewallet	465.76	23.29	8.4

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Branch	City	Customer type	Gender	Product line	Unit price	Quantity	Tax 5%	Total	Date	Payment	cogs	gross income	Rating
A	Yangon	Normal	Male	Sports and travel	86.31	7	30.21	634.38	2/8/2019	Ewallet	604.17	30.21	5.3
C	Naypyitaw	Normal	Male	Electronic accessories	85.39	7	29.89	627.62	3/25/2019	Ewallet	597.73	29.89	4.1
A	Yangon	Member	Female	Electronic accessories	68.84	6	20.65	433.69	2/25/2019	Ewallet	413.04	20.65	5.8
C	Naypyitaw	Normal	Female	Home and lifestyle	73.56	10	36.78	772.38	2/24/2019	Ewallet	735.6	36.78	8
A	Yangon	Member	Female	Health and beauty	36.26	2	3.63	76.15	1/10/2019	Credit card	72.52	3.63	7.2
B	Mandalay	Member	Female	Food and beverages	54.84	3	8.23	172.75	2/20/2019	Credit card	164.52	8.23	5.9
B	Mandalay	Member	Female	Fashion accessories	14.48	4	2.9	60.82	2/6/2019	Ewallet	57.92	2.9	4.5
B	Mandalay	Member	Male	Electronic accessories	25.51	4	5.1	107.14	3/9/2019	Cash	102.04	5.1	6.8
A	Yangon	Normal	Female	Electronic accessories	46.95	5	11.74	246.49	2/12/2019	Ewallet	234.75	11.74	7.1

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Branch	City	Customer type	Gender	Product line	Unit price	Quantity	Tax 5%	Total	Date	Payment	cogs	gross income	Rating
A	Yangon	Normal	Male	Food and beverages	43.19	10	21.6	453.5	2/7/2019	Ewallet	431.9	21.6	8.2
A	Yangon	Normal	Female	Health and beauty	71.38	10	35.69	749.49	3/29/2019	Cash	713.8	35.69	5.7

The contents of the unit price, Tax, Total, Cogs, Gross Income, Rating variables will be divided into two categories. Unit price becomes Over 50 and Under 50, Tax becomes Over 10 and Under 10, Total becomes Over 100 and Under 100, Cogs becomes Over 100 and Under 100, Gross Income becomes Over 10 and Under 10 and Rating becomes High Rating for ratings above 5 and Low Rating for ratings below 5.And for the Date variable, only the month data will be taken, if it has been changed the table data will be like this :
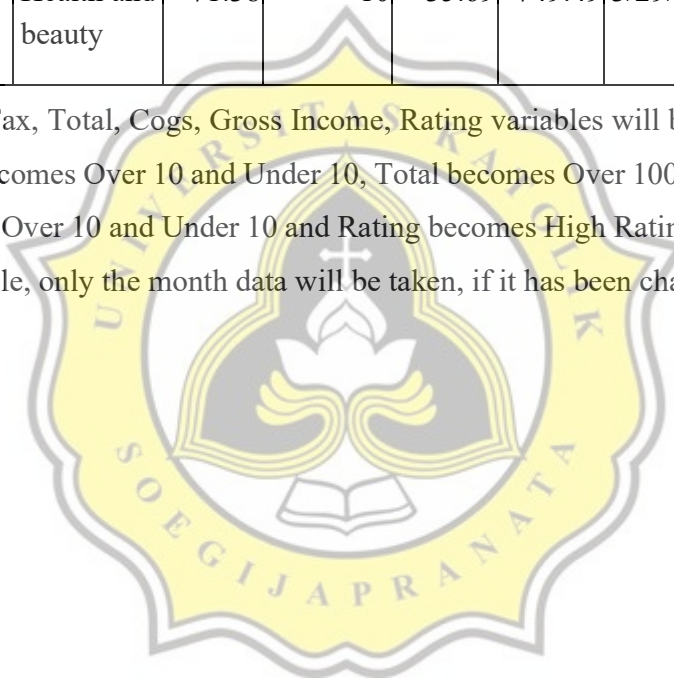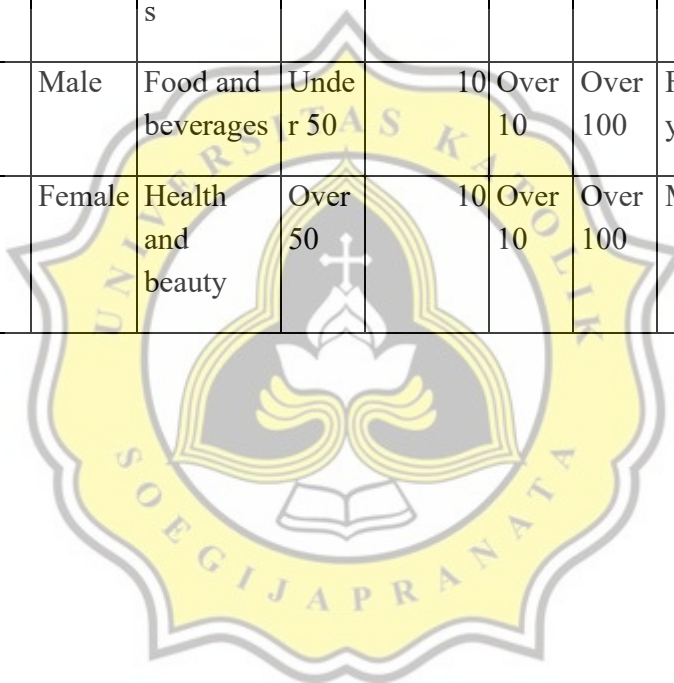
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Table 1.2 : Training Data

NUMBER	Branch	City	Customer type	Gender	Product line	Unit price	Quantity	Tax 5%	Total	Month	Payment	cogs	gross income	Rating
1	A	Yangon	Member	Female	Health and beauty	Over 50	7	Over 10	Over 100	January	Ewallet	Over 100	Over 10	HR
2	C	Naypyitaw	Normal	Female	Electronic accessories	Under 50	5	Under 10	Under 100	March	Cash	Under 100	Under 10	HR
3	A	Yangon	Normal	Male	Home and lifestyle	Under 50	7	Over 10	Over 100	March	Credit card	Over 100	Over 10	HR
4	A	Yangon	Member	Male	Health and beauty	Over 50	8	Over 10	Over 100	January	Ewallet	Over 100	Over 10	HR
5	A	Yangon	Normal	Male	Sports and travel	Over 50	7	Over 10	Over 100	February	Ewallet	Over 100	Over 10	HR
6	C	Naypyitaw	Normal	Male	Electronic accessories	Over 50	7	Over 10	Over 100	March	Ewallet	Over 100	Over 10	LR

NUMBER	Branch	City	Customer type	Gender	Product line	Unit price	Quantity	Tax 5%	Total	Month	Payment	cogs	gross income	Rating
7	A	Yangon	Member	Female	Electronic accessories	Over 50	6	Over 10	Over 100	February	Ewallet	Over 100	Over 10	HR
8	C	Naypyitaw	Normal	Female	Home and lifestyle	Over 50	10	Over 10	Over 100	February	Ewallet	Over 100	Over 10	HR
9	A	Yangon	Member	Female	Health and beauty	Under 50	2	Under 10	Under 100	January	Credit card	Undr 100	Under 10	HR
10	B	Mandalay	Member	Female	Food and beverages	Over 50	3	Under 10	Over 100	February	Credit card	Over 100	Under 10	HR
11	B	Mandalay	Member	Female	Fashion accessories	Under 50	4	Under 10	Under 100	February	Ewallet	Under 100	Under 10	LR
12	B	Mandalay	Member	Male	Electronic accessories	Under 50	4	Under 10	Over 100	March	Cash	Over 100	Under 10	HR

NUMBER	Branch	City	Customer type	Gender	Product line	Unit price	Quantity	Tax 5%	Total	Month	Payment	cogs	gross income	Rating
13	A	Yangon	Normal	Female	Electronic accessories	Under 50	5	Over 10	Over 100	March	Ewallet	Over 100	Over 10	HR
14	A	Yangon	Normal	Male	Food and beverages	Under 50	10	Over 10	Over 100	February	Ewallet	Over 100	Over 10	HR
15	A	Yangon	Normal	Female	Health and beauty	Over 50	10	Over 10	Over 100	March	Cash	Over 100	Over 10	HR

4.1.2 Application of the Algorithm C.45

- To determine High Rating or Low Rating items, the necessary criteria include :

- Branch

- City

- Customer Type

- Gender

- Product LineUnitPrice

- Quantity

- Tax

- Total

- Month

- Payment

- Cogs

- Gross Income

One of the attributes is the solution data per data item called the target attribute, for example the attribute "Rating" with a value of "HR" (High Rating) or "LR" (Low Rating). Attributes have values called "instances", for example the attribute "Branch" has Instances: A, B, C

Based on Table 4.2, a decision table will be made to determine which stock of goods has a high rating or not by looking at the Branch, City, Customer Type, Gender, Product Line, Unit Price, Quantity, Tax, Total, Month, Payment, Cogs, Gross Income. Algorithms used in general :

- Select attributes as root

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- Create branches for each value

- Divide branch cases

- Repeat the above process for each branch until all cases in the branch have the same class selecting attributes based on the highest "gain" value of the existing attributes.

Gain calculation

$$Gain(S,A) = Entropy(S) - \sum_{i=1}^{n} \square * Entropy(Si)$$

Information :

- S : Set

- A : Attribute

- n : number of partitions attribute A

- |Si| : the number of cases on the ith partition

- |S| : number of cases in S

Calculate the Entropy value

$$Entropy(S) = \sum_{i=1}^{n} \square - pi * \log_2 pi$$

Information :

- S : Set

- A : Features

- n : number of partitions S

- pi : the proportion of Si to S

Calculation

Step 1 :

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Specify the decision class

C1 >> Rating = HR = 13 data

C2 >> Rating = LR = 2 data

Total amount of data = 13 + 2 = 15 data

Step 2 :

Calculate the gain value

$$gain = i(13,2) = \frac{-13}{15}\log_2(\frac{13}{15}) - \frac{2}{15}\log_2(\frac{2}{15}) = 0.566509506552905$$

Step 3 :

Calculate the entropy value for each column or attribute

Iteration 1

Column 1 that is calculated the Branch column 3 value : A, B, C

Column 2 that is calculated City column 3 value : Yangon, Naypyitaw, Mandalay

Column 3 that is calculated Customer Type column 2 value : Member, Normal

Column 4 that is calculated Gender column 2 value : Male dan Female

Column 5 that is calculated Product Line column 6 value : Health and Beauty, Electronic Accessories, Home and Lifestyle, Sports and Travel, Food and Beverages, Fashion Accessories

Column 6 that is calculated Unit Price column 2 value : Over 50 dan Under 50

Column 7 that is calculated Quantity column 8 value : 2, 3, 4, 5, 6, 7, 8, 10

Column 8 that is calculated Tax column 2 value : Over 10 dan Under 10

Column 9 that is calculated Total column 2 value : Over 100 dan Under 100

Column 10 that is calculated Month column 3 value : January, February, March

Column 11 that is calculated Payment column 3 value : Cash, Ewallet, Credit Card

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Column 12 that is calculated Cogs column 2 value : Over 100 dan Under 100

Column 13 that is calculated Gross Income column 2 value : Over 10 dan Under 10

Calculate the Gain value of all the information from the column

Table 1.3 : Iteration 1

COLUMN	INFORMATION	AMOUNT	LR	HR	GAIN VALUE
TOTAL DATA		15	2	13	0.566509506552905
BRANCH	A	9	0	9	0
	B	3	1	2	0.91829583405449
	C	3	1	2	0.91829583405449
CITY	YANGON	9	0	9	0
	NAYPYITAW	3	1	2	0.91829583405449
	MANDALAY	3	1	2	0.91829583405449
CUSTOMER TYPE	MEMBER	7	1	6	0.591672778582328
	NORMAL	8	1	7	0.543564443199596
GENDER	MALE	6	1	5	0.650022421648354
	FEMALE	9	1	8	0.503258334775646
PRODUCT LINE	HEALTH AND BEAUTY	4	0	4	0
	ELECTRONIC ACCESSORIES	5	1	4	0.721928094887362

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COLUMN	INFORMATION	AMOUNT	LR	HR	GAIN VALUE
	HOME AND LIFESTYLE	2	0	2	0
	SPORTS AND TRAVEL	1	0	1	0
	FOOD AND BEVERAGES	2	0	2	0
	FASHION ACCESSORIES	1	1	0	0
UNIT PRICE	OVER 50	8	1	7	0.543564443199596
	UNDER 50	7	1	6	0.591672778582328
QUANTITY	2	1	0	1	0
	3	1	0	1	0
	4	2	1	1	1
	5	2	0	2	0
	6	1	0	1	0
	7	4	1	3	0.811278124459133
	8	1	0	1	0
	10	3	0	3	0
TAX 5%	OVER 10	10	1	9	0.468995593589281
	UNDER 10	5	1	4	0.721928094887362
TOTAL	OVER 100	12	1	11	0.413816850303634

COLUMN	INFORMATION	AMOUNT	LR	HR	GAIN VALUE
	UNDER 100	3	1	2	0.91829583405449
MONTH	JANUARY	3	0	3	0
	FEBRUARY	6	1	5	0.650022421648354
	MARCH	6	1	5	0.650022421648354
PAYMENT	CASH	3	0	3	0
	EWALLET	9	2	7	0.76420450650862
	CREDIT CARD	3	0	3	0
COGS	OVER 100	12	1	11	0.413816850303634
	UNDER 100	3	1	2	0.91829583405449
GROSS INCOME	OVER 10	10	1	9	0.468995593589281
	UNDER 10	5	1	4	0.721928094887362

The formula used in the rightmost column uses the same formula when calculating the total data gain.

Entropy for each column :

$$Branch = \frac{9}{15} x 0 + \frac{3}{15} x 0.91829583405449 + \frac{3}{15} x 0.91829583405449 = 0.367318333621796$$

Final Entropy = 0.566509506552905 – 0.367318333621796 = 0.19919117293111

$$City = \frac{9}{15} x 0 + \frac{3}{15} x 0.91829583405449 + \frac{3}{15} x 0.91829583405449 = 0.367318333621796$$

Final Entropy = 0.566509506552905 – 0.367318333621796 = 0.19919117293111

$$Customer\ Type = \frac{7}{15} x 0.5916672778582328 + \frac{8}{15} x 0.543564443199596 = 0.566014999711538$$

Final Entropy = 0.566509506552905 – 0.566014999711538 = 0.000494506841368

$$Customer\ Type = \frac{7}{15} x 0.591672778582328 + \frac{8}{15} x 0.543564443199596 = 0.566014999711538$$

Final Entropy = 0.566509506552905 – 0.561963969524729 = 0.004545537028176

$$Product\ Line = \frac{4}{15} x 0 + \frac{5}{15} x 0.721928094887362 + \frac{2}{15} x 0 + \frac{1}{15} x 0 + \frac{2}{15} x 0 + \frac{1}{15} x 0$$

=0.240642698295787

Final Entropy = 0.566509506552905 – 0.240642698295787 = 0.325866808257118

$$Unit\ Price = \frac{8}{15} x 0.543564443199596 + \frac{7}{15} x 0.591672778582328 = 0.566014999711538$$

Final Entropy = 0.566509506552905 – 0.566014999711538 = 0.000494506841368

$$Quantity = \frac{1}{15} x 0 + \frac{1}{15} x 0 + \frac{2}{15} x 1 + \frac{2}{15} x 0 + \frac{1}{15} x 0 + \frac{4}{15} x 0.8112781244459133$$

+

$$\frac{1}{15} x 0 + \frac{3}{15} x 0 = 0.349674166522435$$

Final Entropy = 0.566509506552905 – 0.349674166522435 = 0.21683534003047

$$Tax = \frac{10}{15} x 0.468995593589281 + \frac{5}{15} x 0.721928094887362 = 0.553306427355308$$

Final Entropy = 0.566509506552905 – 0.553306427355308 = 0.013203079197597

$$Total = \frac{12}{15} x 0.413816850303634 + \frac{3}{15} x 0.91829583405449 = 0.514712647053805$$

Final Entropy = 0.566509506552905 – 0.514712647053805 = 0.0517968594991

$$Month = \frac{3}{15} x 0 + \frac{6}{15} x 0.650022421648354 + \frac{6}{15} x 0.650022421648354 = 0.520017937318683$$

Final Entropy = 0.566509506552905 – 0.520017937318683 = 0.046491569234222

$$Payment = \frac{3}{15} x 0 + \frac{9}{15} x 0.76420450650862 + \frac{3}{15} x 0 = 0.458522703905172$$

Final Entropy = 0.566509506552905 – 0.458522703905172 = 0.107986802647733

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$$Cogs = \frac{12}{15} x\, 0.413816850303634 + \frac{3}{15} x\, 0.91829583405449 = 0.514712647053805$$

Final Entropy = 0.566509506552905 – 0.514712647053805 = 0.0517968594991

$$Gross\ Income = \frac{10}{15} x\, 0.468995593589281 + \frac{5}{15} x\, 0.721928094887362 = 0.553306427355308$$

Final Entropy = 0.566509506552905 – 0.553306427355308 = 0.013203079197597

The highest entopy value is Product Line 0.325866808257118
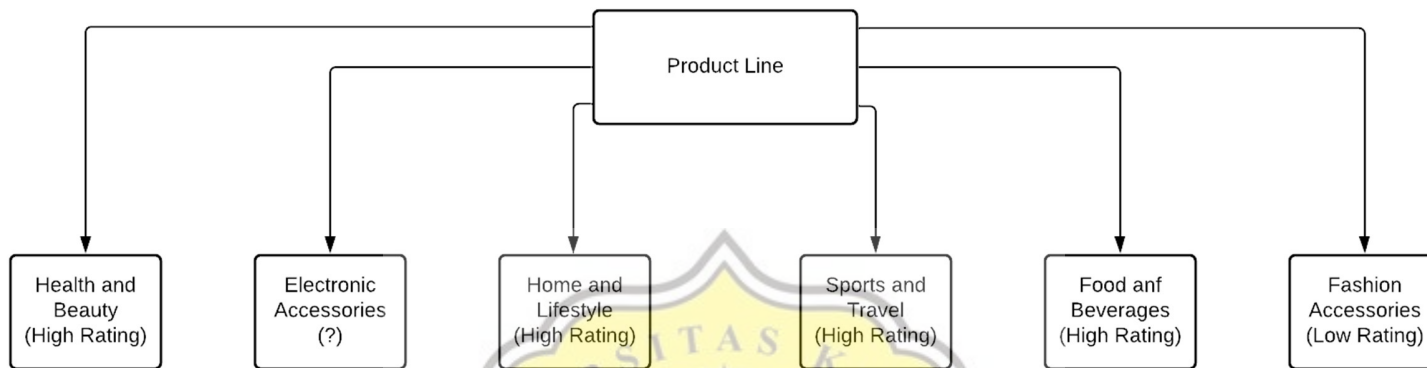
Figure 1.1. Decision Tree Iteration 1

Iteration 2

What is processed in iteration 2 is Product Line = Electronic Accessories

   In addition, the Product Line Electronic Accessories data is removed from the table because only the Product Line Electronic Accessories data still has the "HR" and "LR" values, then recalculate using the same formula as the first iteration calculation.

Table 1.4 : Iteration 2

NUMBER	Branch	City	Customer type	Gender	Product line	Unit price	Quantity	Tax 5%	Total	Month	Payment	cogs	gross income	Rating
2	C	Naypyitaw	Normal	Female	Electronic accessories	Under 50	5	Under 10	Under 100	March	Cash	Under 100	Under 10	HR
6	C	Naypyitaw	Normal	Male	Electronic accessories	Over 50	7	Over 10	Over 100	March	Ewallet	Over 100	Over 10	LR
7	A	Yangon	Member	Female	Electronic accessories	Over 50	6	Over 10	Over 100	February	Ewallet	Over 100	Over 10	HR
12	B	Mandalay	Member	Male	Electronic accessories	Under 50	4	Under 10	Over 100	March	Cash	Over 100	Under 10	HR

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NUMBER	Branch	City	Customer type	Gender	Product line	Unit price	Quantity	Tax 5%	Total	Month	Payment	cogs	gross income	Rating
13	A	Yangon	Normal	Female	Electronic accessories	Under 50	5	Over 10	Over 100	March	Ewallet	Over 100	Over 10	HR

Table 1.5 : Process Iteration 2

KOLOM	INFORMASI	JUMLAH	LR	HR	NILAI GAIN	ENTROPY		ENTROPY AKHIR
TOTAL DATA		5	1	4	0.721928094887362			
BRANCH	A	2	0	2	0	0	0.4	0.32
	B	1	0	1	0	0		
	C	2	1	1	1	0.4		
CITY	YANGON	2	0	2	0	0	0.4	0.32
	NAYPYITAW	2	1	1	1	0.4		
	MANDALAY	1	0	1	0	0		

KOLOM	INFORMASI	JUMLAH	LR	HR	NILAI GAIN	ENTROPY		ENTROPY AKHIR
CUSTOMER TYPE	MEMBER	2	0	2	0	0	0.55	0.17
	NORMAL	3	1	2	0.91829583405449	0.55		
GENDER	MALE	2	1	1	1	0.4	0.4	0.32
	FEMALE	3	0	3	0	0		
UNIT PRICE	OVER 50	2	1	1	1	0.4	0.4	0.32
	UNDER 50	3	0	3	0	0		
TAX 5%	OVER 10	3	1	2	0.91829583405449	0.55	0.55	0.17
	UNDER 10	2	0	2	0	0		
TOTAL	OVER 100	4	1	3	0.811278124459133	0.65	0.65	0.07
	UNDER 100	1	0	1	0	0		
MONTH	JANUARY	0	0	0	0	0	0.65	0.07
	FEBRUARY	1	0	1	0	0		
	MARCH	4	1	3	0.811278124459133	0.65		

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KOLOM	INFORMASI	JUMLAH	LR	HR	NILAI GAIN	ENTROPY		ENTROPY AKHIR
PAYMENT	CASH	2	0	2	0	0	0.55	0.17
	EWALLET	3	1	2	0.91829583405449	0.55		
	CREDIT CARD	0	0	0	0	0		
COGS	OVER 100	4	1	3	0.811278124459133	0.65	0.65	0.07
	UNDER 100	1	0	1	0	0		
GROSS INCOME	OVER 10	3	1	2	0.91829583405449	0.55	0.55	0.17
	UNDER 10	2	0	2	0	0		

Iterasi 2 nilai Entropy yang tertinggi adalah atribut Branch, City, Gender, Unit Price , yaitu 0.32
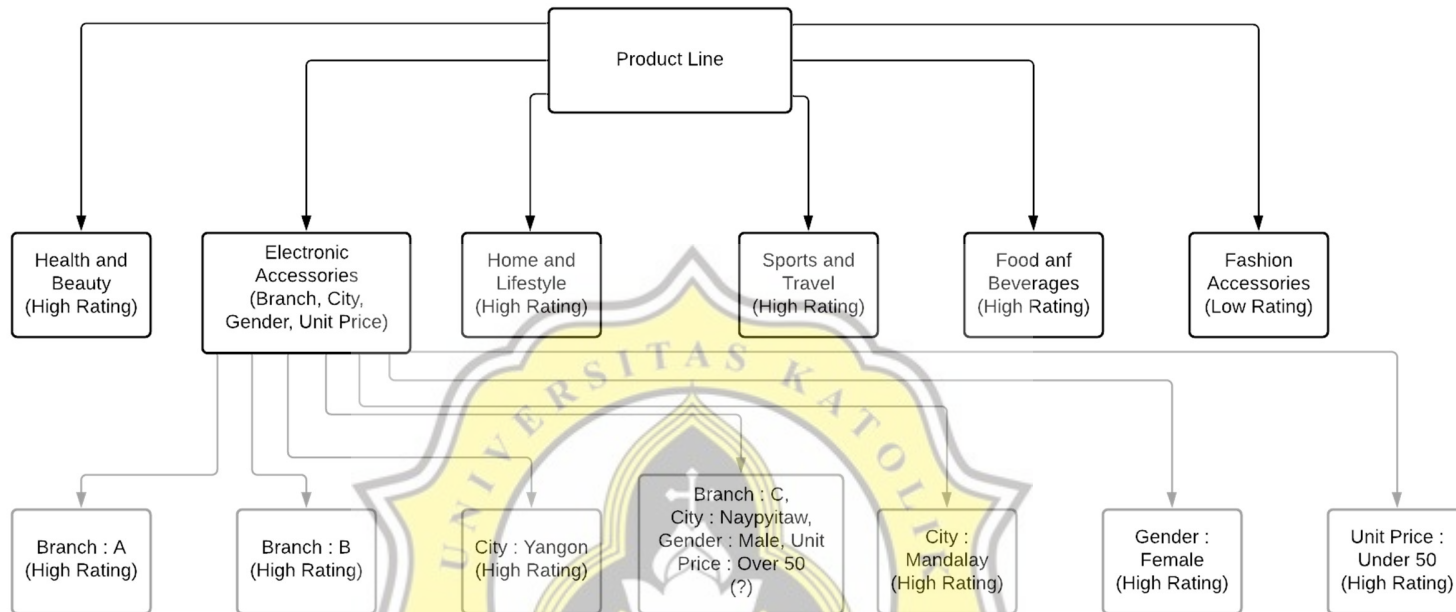
Figure 1.1. Decision Tree Iteration 2

Iteration 3

Processed attributes Branch : C, City : Naypyitaw, Gender : Male, Price : Over 50
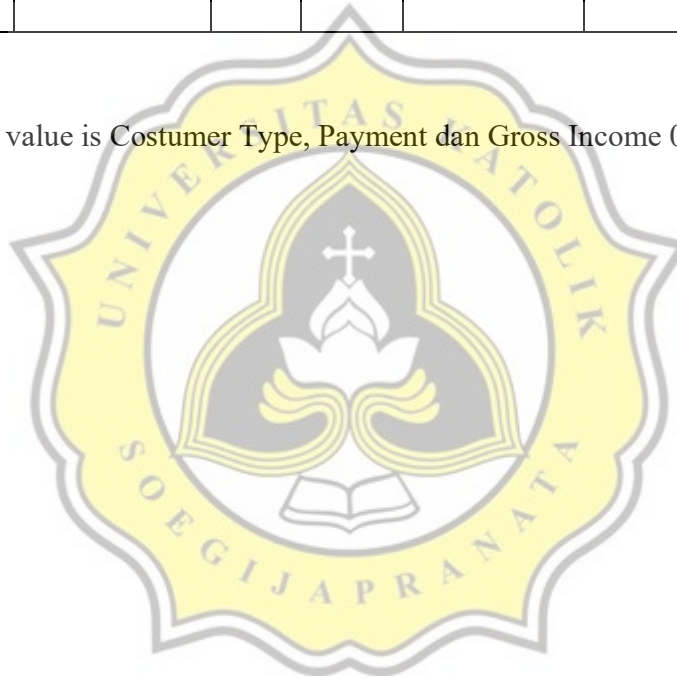
Table 1.6 : Iteration 3

NUMBER	Branch	City	Customer type	Gender	Product line	Unit price	Quantity	Tax 5%	Total	Month	Payment	cogs	gross income	Rating
2	C	Naypyitaw	Normal	Female	Electronic accessories	Under 50	5	Under 10	Under 100	March	Cash	Under 100	Under 10	HR
6	C	Naypyitaw	Normal	Male	Electronic accessories	Over 50	7	Over 10	Over 100	March	Ewallet	Over 100	Over 10	LR
7	A	Yangon	Member	Female	Electronic accessories	Over 50	6	Over 10	Over 100	February	Ewallet	Over 100	Over 10	HR
12	B	Mandalay	Member	Male	Electronic accessories	Under 50	4	Under 10	Over 100	March	Cash	Over 100	Under 10	HR

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Table 1.7 : Process Iteration 3

KOLOM	INFORMASI	JUMLAH	LR	HR	NILAI GAIN	ENTROPY		ENTROPY AKHIR
TOTAL DATA		4	1	3	0.81			
CUSTOMER TYPE	MEMBER	2	0	2	0	0	0.5	0.31
	NORMAL	2	1	1	1	0.5		
TAX 5%	OVER 10	2	1	1	1	0.5	0.5	0.31
	UNDER 10	2	0	2	0	0		
TOTAL	OVER 100	3	1	2	0.92	0.69	0.69	0.12
	UNDER 100	1	0	1	0	0		
MONTH	JANUARY	0	0	0	0	0	0.69	0.12
	FEBRUARY	1	0	1	0	0		
	MARCH	3	1	2	0.92	0.69		
PAYMENT	CASH	2	0	2	0	0	0.5	0.31
	EWALLET	2	1	1	1	0.5		

	CREDIT CARD	0	0	0	0	0		
COGS	OVER 100	3	1	2	0.92	0.69	0.69	0.12
	UNDER 100	1	0	1	0	0		
GROSS INCOME	OVER 10	2	1	1	1	0.5	0.5	0.31

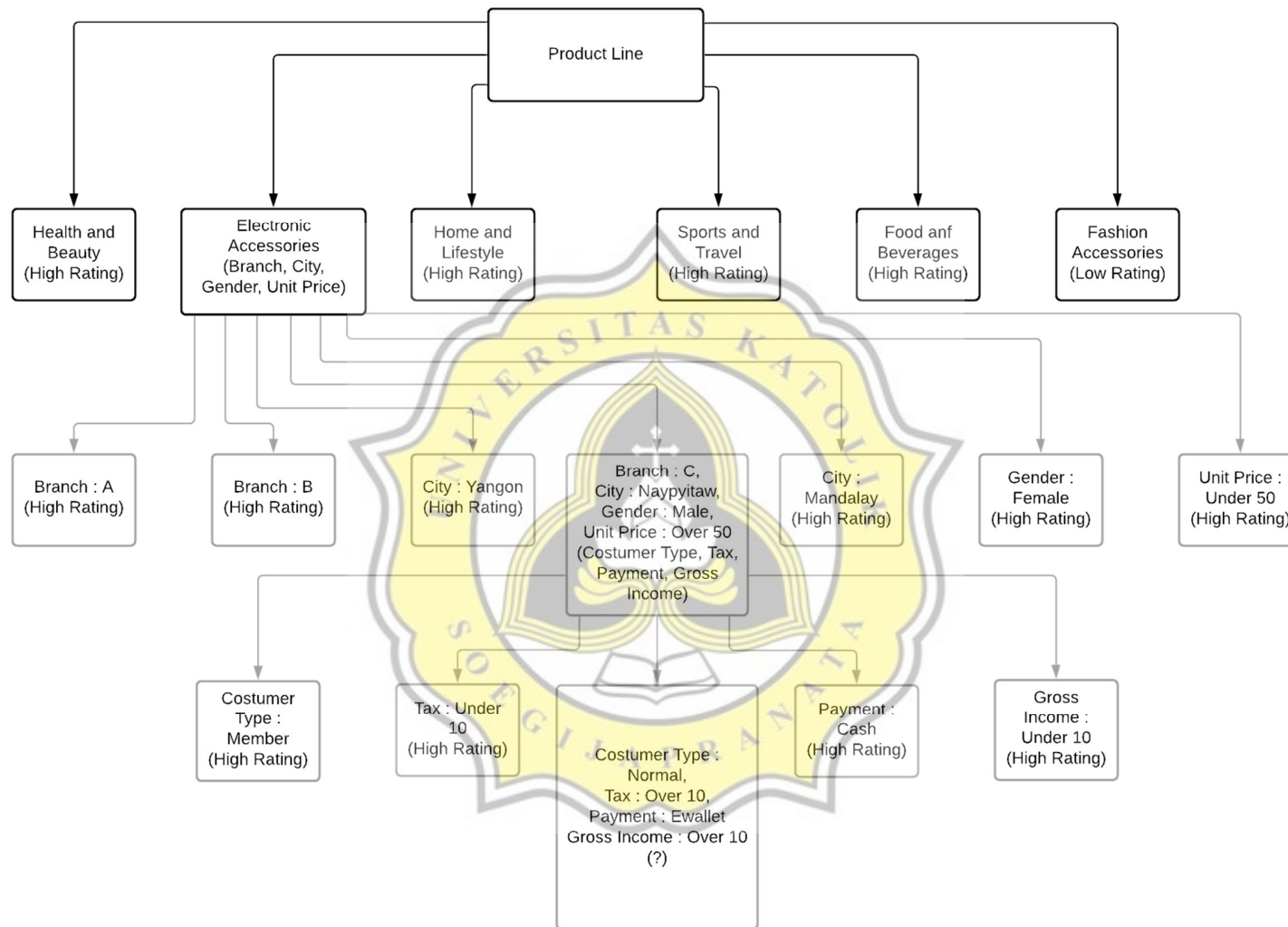Iteration 3 the highest attributes value is Costumer Type, Payment dan Gross Income 0.31

Figure 1.2. Decision Tree Iteration 3

Iteration 4

Processed attribute Costumer Type : Normal, Tax : Over 10, Payment : Ewallet, Gross Income : Over 10

Table 1.8 : Iteration 4

NUMBER	Branch	City	Customer type	Gender	Product line	Unit price	Quantity	Tax 5%	Total	Month	Payment	cogs	gross income	Rating
2	C	Naypyitaw	Normal	Female	Electronic accessories	Under 50	5	Under 10	Under 100	March	Cash	Under 100	Under 10	HR
6	C	Naypyitaw	Normal	Male	Electronic accessories	Over 50	7	Over 10	Over 100	March	Ewallet	Over 100	Over 10	LR
7	A	Yangon	Member	Female	Electronic accessories	Over 50	6	Over 10	Over 100	February	Ewallet	Over 100	Over 10	HR

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Table 1.9 : Iteration 4

KOLOM	INFORMASI	JUMLAH	LR	HR	NILAI GAIN	ENTROPY		ENTROPY AKHIR
TOTAL DATA		3	1	2	0.92			
TOTAL	OVER 100	2	1	1	1	0.67	0.67	0.25
	UNDER 100	1	0	1	0	0		
MONTH	JANUARY	0	0	0	0	0	0.67	0.25
	FEBRUARY	1	0	1	0	0		
	MARCH	2	1	1	1	0.67		
COGS	OVER 100	2	1	1	1	0.67	0.67	0.25
	UNDER 100	1	0	1	0	0		

Iteration 4 the highest Entropy value is attributes Total, Month, Cogs 0.25

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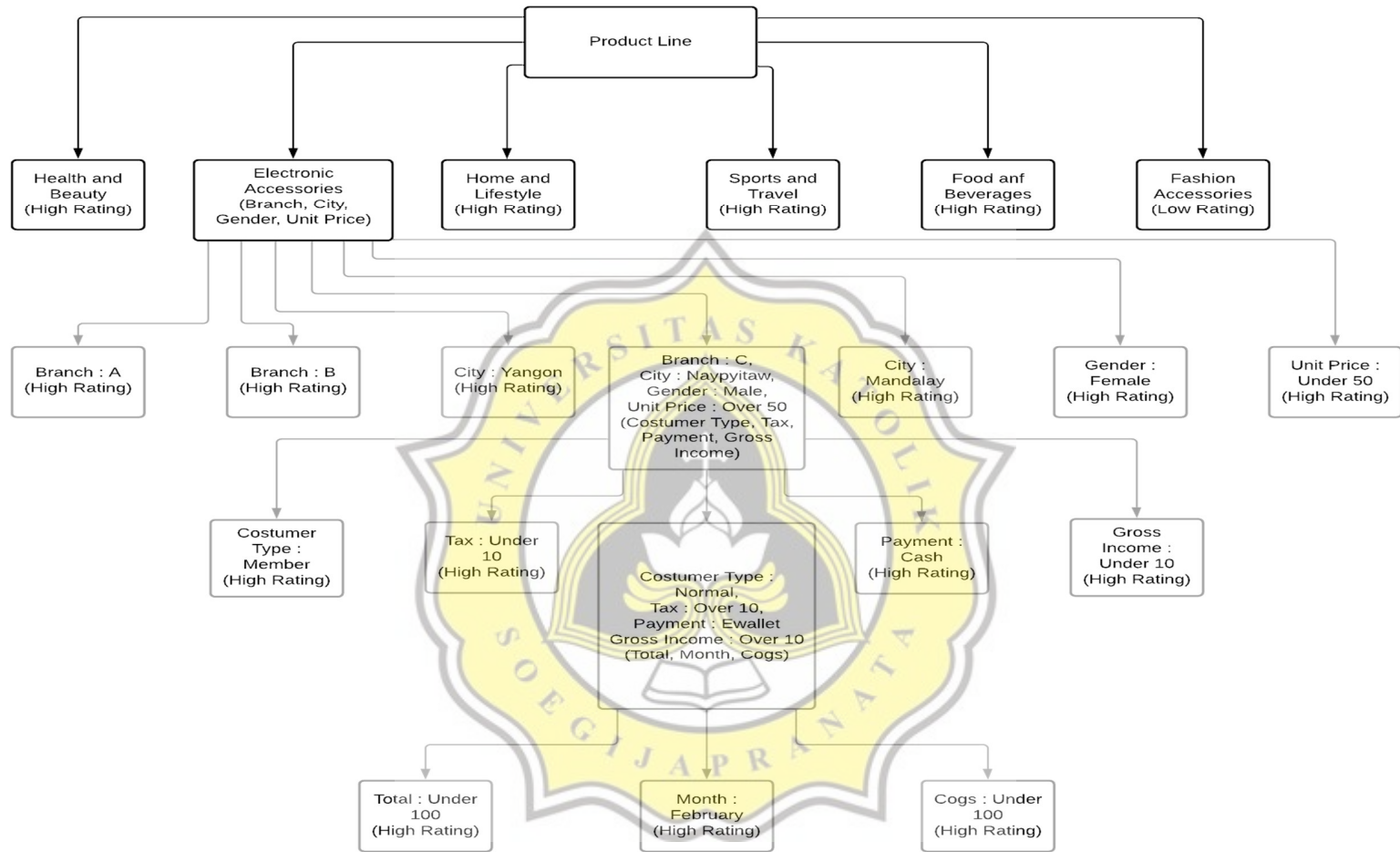
Figure 1.2. Decision Tree Iteration 4

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From the calculation of the sample data above, it can be conluded

If Product Line = Health and Beauty then Rating = High Rating

If Product Line = Home and Lifestyle then Rating = High Rating

If Product Line = Sport and Travel then Rating = High Rating

If Product Line = Food and Beverage then Rating = High Rating

If Product Line = Fashion Accessories then Rating = Low Rating

If Product Line = Electronic Accessories and Branch = A then Rating = High Rating

If Product Line = Electronic Accessories and Branch = B then Rating = High Rating

If Product Line = Electronic Accessories and City = Yangon then Rating = High Rating

If Product Line = Electronic Accessories and City = Mandalay then Rating = High Rating

If Product Line = Electronic Accessories and Gender = Female then Rating = High Rating

If Product Line = Electronic Accessories and Unit Price = Under 50 then Rating = High Rating

If Product Line = Electronic Accessories and Branch = C, City = Naypyitaw, Gender = Male, Unit Price = Over 50 and Costumer Type = Member then Rating = High Rating

If Product Line = Electronic Accessories and Branch = C, City = Naypyitaw, Gender = Male, Unit Price = Over 50 and Tax = Under 10 then Rating = High Rating

If Product Line = Electronic Accessories and Branch = C, City = Naypyitaw, Gender = Male, Unit Price = Over 50 and Payment = Cash then Rating = High Rating

If Product Line = Electronic Accessories and Branch = C, City = Naypyitaw, Gender = Male, Unit Price = Over 50 and Gross Income = Under 10 then Rating = High Rating

If Product Line = Electronic Accessories and Branch = C, City = Naypyitaw, Gender = Male, Unit Price = Over 50 and Costumer Type = Normal, Tax = Over 10, Payment = Ewallet, Gross Income = Over 10 and Total = Under 100 then Rating = High Rating

If Product Line = Electronic Accessories and Branch = C, City = Naypyitaw, Gender = Male, Unit Price = Over 50 and Costumer Type = Normal, Tax = Over 10, Payment = Ewallet, Gross Income = Over 10 and Month = February then Rating = High Rating

If Product Line = Electronic Accessories and Branch = C, City = Naypyitaw, Gender = Male, Unit Price = Over 50 and Costumer Type = Normal, Tax = Over 10, Payment = Ewallet, Gross Income = Over 10 and Cogs = Under 100 then Rating = High RatingDesain
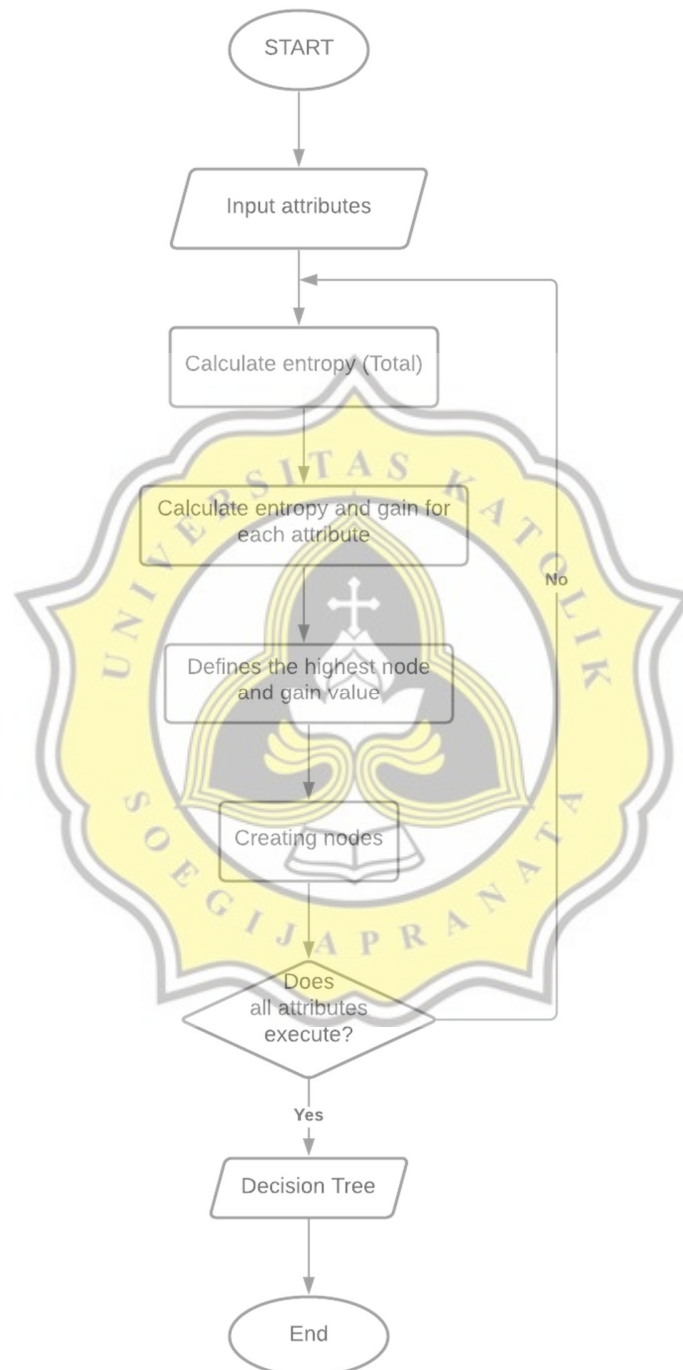
4.2 Design

4.2.1 Flow Chart

Figure 1.3. Flowchart Pocess C4.5 Algorithm