Hitung Entropy dan gain serta pohon keputusan yang terbentuk pd table di bawah

1	Outlook	Temperature	Humidity	Windy	Play							
2	Sunny	Hot	High	No	Don't Play	Entropy (Total) :	(-4/14 *log2(4/14)) + (-10/14*log2(10/14))					
3	Sunny	Hot	High	Yes	Don't Play	Entropy (Total):	0,8631					
4	Cloudy	Hot	High	No	Play							
5	Rainy	Mild	High	No	Play	Outlook		Temperature				
6	Rainy	Cool	Normal	No	Play	Entropy (Sunny):	(-3/5*log2(3/5)) + (-2/5*log2(2/5))	Entropy(Hot):	(-2/4*log	2(2/4) + (-	-2/4*log2(2/4)	
7	Rainy	Cool	Normal	Yes	Play	Entropy (Sunny):	0,4421 + 0,5287	Entropy(Hot):	0,5 + 0,5			
8	Cloudy	Cool	Normal	Yes	Play	Entropy (Sunny):	0,9708	Entropy(Hot):	1			
9	Sunny	Mild	High	No	Don't Play							
10	Sunny	Cool	Normal	No	Play	Entropy (cloudy):	(-0/4*log2(0/4)) + (-4/4*log2(4/4))	Entropy (Mild):	(-2/6*log	2(2/6) + (-	-4/6*log2(4/6)	
-11	Rainy	Mild	Normal	No	Play	Entropy (cloudy):	0	Entropy (Mild):	0,5283 +	0,3899		
12	Sunny	Mild	Normal	Yes	Play			Entropy (Mild):	0,9182			
13	Cloudy	Mild	High	Yes	Play							
14	Cloudy	Hot	Normal	No	Play	Entropy (Rainy):	(-1/5*log2(1/5) + (-4/5*log2(4/5))	Entropy (Cool):	(-0/4*log	2(0/4) + (-4/4*log2(4/4)	
15	Rainy	Mild	High	Yes	Don't Play	Entropy (Rainy):	0,4643 + 0,2575	Entropy (Cool):	0+0			
16						Entropy (Rainy):	0,7218	Entropy (Cool):	0			
17												
18						Gain(Total,Outlook)	0,8631 - ((5/14 * 0,9708) + (4/14*0)+(5/14*0,72	18 Gain(Total,Temperature)	0,8631 -	(4/14*1)	+ (6/14*0,9182) + (4/14 * 0))
19						Gain(Total,Outlook)	0,8632 - (0,3467 + 0 + 0,2577)	Gain(Total,Temperature)	0,8632 -	0,2857 +	0,3935 + 0)	
20						Gain(Total,Outlook)	0,2588	Gain(Total,Temperature)	0,1840			
21												
22												
23						Humidity		Windy				
24						Entropy (High):	(-4/7 * log2(4/7)) + (-3/7*log2(3/7))	Entropy (Yes):	(-2/6*log	2(2/6)) + ((-4/6*log2(4/6))	
25						Entropy (High):	0.4613 + 0.5238	Entropy (Yes) :	0.9182			
26						Entropy (High):	0,9851					
27												
28						Entropy (Normal) :	(-0/7 * log2(0/7)) + (-7/7*log2(7/7))	Entropy (No):		2(2/8)) + ((-6/8*log2(6/8))	
29						Entropy (Normal) :	0	Entropy (No):	0.8112			
30												
31						Gain(Total, Humidty	0,8632 - ((7/14* 0,9852)+ (7/14 * 0))	Gain(Total, Windy)	0,8632 -	(6/14*0,9	9182) + (8/14* 0,81	12))
32						Gain(Total, Humidty	0.3706	Gain(Total, Windy)	0,8632 - 0	0.8570		
33								Gain(Total, Windy)	0,0062			
34												

- Dari hasil di ketahui bahwa atribut dengan gain tertinggi adalah Humidity yaitu sebesar 0,3706, Sehingga Humidity dapat menjadi root (Akar).
- Ada 2 atribut dari Humidity, yaitu High dan Normal sudah mengklasifikasikan kasus menjadi 1, yaitu keputusan yes, dan sekarang tinggal nilai high yang perlu di hitung lagi

Melakukan perhitungan semua entropy dan gain dari semua kasus di mana attribute high menjadi node akar

Outlool	Temperature	Humidi	Windy	Play				
Sunny	Hot	High	No	Don't Play	Entropy (Total):	(-4/7*log2(4/7)) + (-3/7*log2(3/7))		
Sunny	Hot	High	Yes	Don't Play	Entropy (Total):	0.9852		
Cloudy	Hot	High	No	Play				
Rainy	Mild	High	No	Play	Outlook		Temperature	
Sunny	Mild	High	No	Don't Play	Entropy(Sunny):	(-3/3 *log(3/3)) + (-0/3*log(3/3))	Entropy(Hot):	(-2/3*log2(2/3)) + (-1/3*log2(1/3))
Cloudy	Mild	High	Yes	Play	Entropy(Sunny):	0	Entropy(Hot):	0.9182
Rainy	Mild	High	Yes	Don't Play				
					Entropy(Cloudy):	(-0/2*log2(0/2)) + (-2/2*log2(2/2))	Entropy (Mild):	(-2/4*log2(2/4)) + (-2/4*log2(2/4))
					Entropy(Cloudy):	0	Entropy (Mild):	1
					Entropy(Rainy):	(-1/2*log2(1/2))+ (-1/2*log2(1/2))		0,9852 - ((3/7*0,9182) + (4/7 * 1))
					Entropy(Rainy):	1	Gain(Total,Temperature):	0.0202
						0,9852 - ((3/7*0) + (2/7 * 0) + (2/7*1))		
					Gain(Total,Outlook):	0.6994		
					Windy			
					Entropy (No):	(-2/4*log2(2/4)) + (-2/4*log2(2/4))		
					Entropy (No):	1		
					Entropy (Yes):	(-2/3*log2(2/3)) + (-1/3*log2(1/3))		
					Entropy (Yes) :	0.9182		
					Elitropy (res) .	0.9182		
					Gain(Total, Windy):	0,9852 - ((4/7*1) + (3/7*0,9182))		
					Gain(Total,Windy):	0.0202		

- Atribute dengan gain tertinggi adalah Outlook yaitu sebesar 0,6994, sehingga menjadikan Outlook menjadi node cabang dari nilai attribute High
- Di dalam Atribute look terdapat 3 nilai yaitu
 - 1. Cloudy -> diklasifikasikan kasus 1 (Yes)
 - 2. Sunny -> di klasifikasikan kasus 1 (No)
 - 3. Rainy -> masih perlu di hitung lagi

Menghitung Entropy dan gain dari semua kasus ,yang menjadi node cabang dari attribute Rainy

Outlook	Temper	Humidit	Windy	Play				
Rainy	Mild	High	No	Play	Entropy(Total):	(-1/2*log2(1/2)) + (-1/2*log2(1/2))		
Rainy	Mild	High	Yes	Don't Play	Entropy(Total):	1		
					Temperature		Windy	
					Entropy (Mild):	(-1/2*log2(1/2)) + (-1/2*log2(1/2))	Entropy(No):	(-0/1*log2(0/1) + (-1/1*log2(1/1))
					Entropy (Mild):	1	Entropy(No):	0
							Entropy (Yes) :	(-1/1*log2(1/1) + (-0/1*log2(0/1))
							Entropy (Yes):	0
					Gain (Total,Temperature) :	1-(2/2*1)	Gain (Total, Windy) :	1-((1/2*0) + (1/2*0))
					Gain (Total,Temperature) :	0	Gain (Total, Windy):	1

- Di dapatkan nilai gain tertinggi adalah Windy sebesar 1,sehingga Windy dapat menjadi node cabang dari attribute Rainy
- Ada 2 nilai dari attribute Windy yaitu Yes dan No
 - 1. Nilai attribute No mengklasisifikasikan kasus menjadi 1 (Yes)
 - 2. Nilai attribute Yes Mengklasifikasikan kasus menjadi 1 (No)
- Karena sudah habis maka tidak perlu di lakukan perhitungan lagi

Tree yang terbentuk dari perhitungan di atas

