Decision _Tree

1.What is the percentage of correct classification of both (Purchased and Not Purchased) to the total input of test set?

```
The confusion Matrix:
 [[77  8]
 [ 9 40]]
```

	purchased	Not Purchased	
Purchased	77 TP	8 FP	
Not_Purchased	9 F_Np	40 T_Np	

Accuracy = T(Purchased)+T(Not Purchased)÷T(Purchased)+T(Not Purchased)+F(Purchased)+F(Not Purchased)

=77+40÷77+40+8+9=117÷134= 0.87

Recall:

What Is the percentage of correct Classification Of Purchased to the total input of Purchased in the test set?

```
The confusion Matrix:
 [[77  8]
 [ 9 40]]
```

	purchased	Not Purchased	
Purchased	77 TP	8 FP	
Not_Purchased	9 F_Np	40 T_Np	

Recall=T(Purchased)÷T(Purchased)+F(Purchased)

=77÷77+8=77÷85=0.90

What Is the percentage of correct Classification Of Not Purchased to the total input of NotPurchased in the test set?

```
The confusion Matrix:
 [[77  8]
 [ 9 40]]
```

	purchased	Not Purchased	
Purchased	77 TP	8 FP	
Not_Purchased	9 F_Np	40 T_Np	

Recall= T(Not_Purchased) ÷T(Not_Purchased) +F(Not_Purchased)

=40÷40+9=40÷49=0.81

Precision:

What is the percentage of correct Classification of (Purchased) to sum of correctly Classified as (Purchased) and wrongly classified as (Purchased) in the test set?

```
The confusion Matrix:
 [[77  8]
 [ 9 40]]
```


	purchased	Not Purchased	
Purchased	77 TP	8 FP	
Not_Purchased	9 F_Np	40 T_Np	

Precision=T(Purchased)÷T(Purchased)+F(Purchased)

= 77÷77+9=77÷86=0.895

What is the percentage of correct Classification of (Not_Purchased) to sum of correctly Classified as (Not_Purchased) and wrongly classified as (Not_Purchased) in the test set?


```
The confusion Matrix:
 [[77  8]
 [ 9 40]]
```


	purchased	Not Purchased	
Purchased	77 TP	8 FP	
Not_Purchased	9 F_Np	40 T_Np	

Precision=T(Not_Purchased)÷T(Not_Purchased)+F(Not_Purchased)

=40÷40+8=40÷48= 0.83

F1_Measure:

What is the overall performance of Purchased?

```
The confusion Matrix:
 [[77  8]
 [ 9 40]]
```

	purchased	Not Purchased	
Purchased	77 TP	8 FP	
Not_Purchased	9 F_Np	40 T_Np	

F1_Measure=2*0.90*0.89÷0.90+0.89=1.602÷1.79=0.894

What is the overall performance of Not_Purchased?

```
The confusion Matrix:
 [[77  8]
 [ 9 40]]
```

	purchased	Not Purchased	
Purchased	77 TP	8 FP	
Not_Purchased	9 F_Np	40 T_Np	

F1_Measure=2*0.81* 0.83÷0.81+0.83=1.3446÷1.64=0.819

Macro_Average:

```
The confusion Matrix:
 [[77  8]
 [ 9 40]]
```

	purchased	Not Purchased	
Purchased	77 TP	8 FP	
Not_Purchased	9 F_Np	40 T_Np	

Precision:

What is the average performance of Precision(correctly and wrongly classified)?

Precision(Purchased)+Precision(Not_Purchased)÷2

=0.895+0.83÷2=1.725÷2=0.86

Recall:

What is the average performance of Recall(correctly classified)?

Recall(Purchased)+Recall(Not_Purchased)÷2

=0.90+0.81÷2=1.71÷2

=0.85

Which is the average performance of F1_Measure(overall_performance)?

=F1(Purchased)+F2(Not_Purchased)÷2

=0.894+0.819÷2=1.713÷2

=0.85

Weighted_Average:

```
The confusion Matrix:
 [[77  8]
 [ 9 40]]
```

	purchased	Not Purchased	
Purchased	77 TP	8 FP	
Not_Purchased	9 F_Np	40 T_Np	

Precision:

Total count in the test set = 134

Total count of Purchased in the test set = 117

Total count of Not_Purchased in the test set = 17

What is the sum of Product of proportion rate weight of each class?

Precision(Purchased)*117÷134+Precision(Not_ Purchased)*17÷134

Precision=0.89*117÷134+0.83*17÷134
=104.13÷134+14.11÷134

=0.7770+0.1052

=0.88

Recall:

What is the sum of product of proportion rate weight of each class?

Recall(Purchased)*117÷134+Recall(Not_Purchased)*17÷134

Recall=0.90*117÷134+0.81*17÷134

=105.3÷134+÷13.77÷134

=0.785+0.102=0.88

F1_Measure

What is the sum of product of proportion rate weight of each class?

F1_Measure=f1(Purchased)*85÷134+F2(Not_Purchased)*49÷134

=0.894*117÷134+0.819*17÷134
=104.59÷134+13.92÷134
=0.7805+0.1038
=0.88