Classification in Machine Learning

Model	Random Forest			Decision Tree			SVM		
Confusion Matrix		**NP**	**P**		**NP**	**P**		**NP**	**P**
	NP	78 TNP	7 FNP	**NP**	76 TNP	9 FNP	**NP**	82 TNP	3 FNP
	P	6 FP	43 TP	**P**	8 FP	41 TP	**P**	26 FP	23 TP
NP – Not purchased , P - Purchased									
No. of Not purchased (NP)	85			85			85		
No. of purchased (P)	49			49			49		
Sum of NP and P	134			134			134		
Accuracy of the model	78+43/134 = 0.91			76+41/134 = 0.88			82+23/134 = 0.79		
What is the % of correct classification of NP	78/85 = 0.92			76/85 = 0.9			72/85 = 0.97		
What is the % of correct classification of P	43/49 = 0.88			41/49 = 0.84			23/49 = 0.47		
Precision									
What is the % of correct classification of NP to total prediction of NP	78/(78+6) = 0.93			76/(76+8) = 0.91			82/(82+23) = 0.76		
What is the % of correct classification of P to total prediction of P	43/(7+43) = 0.86			41/(9+41) = 0.82			23/(3+23)=0.89		
F1									
What is the overall % of NP	2 *(.92*.93)/(.92+.93) = 0.93			2*(0.9*0.91)/(0.9+0.91) = 0.91			2*.97*.76/(0.97+0.76)= 0.86		
What is the overall % of P	2*(.88+.86)/(.88+.86) = 0.87			2*0.84*0.82/(0.84+0.82) = 0.83			2*0.47*0.89/(0.47+0.89) = 0.62		
Macro Average									
What is the Avg Performance of correctly classified	0.92+0.88/ 2 = 0.9			0.9+0.84/2 = 0.87			0.97+0.47/2 = 0.72		
What is the Avg Performance of correctly and wrongly classified	0.93+0.86/ 2 = 0.895			0.91+0.82/2 = 0.865			0.76 +0.89/2 = 0.82		
What is the Avg Performance of overall classified	0.93+.87/2 = 0.9			0.91+0.83/2 = 0.87			0.86+0.62/2 = 0.74		

Weighted Average					
Proportion Rate of NP	85/134 =0.63		85/134 =0.63		85/134 =0.63
Proportion Rate of P	49/134 = 0.37		49/134 = 0.37		49/134 = 0.37
What is the weightage Avg Performance of correctly classified	(.92/.63)+(.88/.37)= 0.91		(0.9/0.63)+(0.84/0.37) = 0.88		(0.97/0.63)+(0.47/0.37) =0.79
What is the weightage Avg Performance of correctly and wrongly classified	(.93/.63)+(.86/.37) = 0.91		(0.91/0.63)+(0..82/0.37) = 0.88		(0.76/0.63)+(0.89/0.37) =0.81
What is the weightage Avg Performance of overall classified	(.93/.63)+(.87/.37)= 0.91		(0.91/0.63)+(0.83/0.37) = 0.89		(0.86/0.63)+(0.62/0.37) =0.78