Random Forest Classifier

Q.What is the percentage of correct classification of both with respect to total data?

Ans.Accuracy is (78+44)/(78+7+5+44) = 122/134 =0.91

Q.What is the percentage of correct classification of non-buyers with respect to non-buyers?

Ans.Recall of non-buyers

ie,

(78)/(78+7)=>0.92

Q.What is the percentage of correct classification of buyers with respect to total buyers?

Ans.Recall of buyers

ie,

(44)/(49)=>0.90

Q.What is the percentage of correct classification of non-buyers with respect to all classification of non-buyers?

Ans. Precision of non-buyers

ie,

(78)/(78+5)=>0.94

Q. What is the percentage of correct classification of buyers with respect to all classification of buyers?

Ans.Precision of buyers

ie,

(44)/(44+7)=>0.86

F1 value of Buyers = 2*precision*accuracy/recall+precison = 2*0.86*0.9/(0.86+.9)=1.548/1.76=0.88

F1 value of Non Buyers = 2*precision*accuracy/recall+precison = 2*0.92*0.94/(0.92+.94)=1.73/1.86=0.93

Q.Marco-average of Precision:

Ans:Average of Precision = (0.94+0.86)/2=1.8/2=0.9

Q.Weighted Average of Precision:

Ans: To standardize data

((Precision(Buyers)*No of Buyers)/Total Users)+ ((Precision(Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.86*49/134)+(0.94*85/134)=0.31+0.60=0.91

Q.Marco-average of Recall:

Ans:Average of Recall = (0.9+0.92)/2=1.812/2=0.91

Q.Weighted Average of Recall:

Ans: To standardize data

((Recall (Buyers)*No of Buyers)/Total Users)+ ((Recall (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.92*85/134)+(0.9*49/134)=0.58+0.33=0.91

Q.Marco-average of F1 value:

Ans:Average of F1 value = (0.88+0.93)/2=1.81/2=0.905

Q.Weighted Average of F1 value:

Ans: To standardize data

((F1 value (Buyers)*No of Buyers)/Total Users)+ ((F1 value (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.93*85/134)+(0.88*49/134)=0.59+0.32=0.91

Decision Tree Classifier

Q.What is the percentage of correct classification of both with respect to total data?

Ans.Accuracy is (75+45)/(75+45+8+6) = 120/134 =0.895 ~ 0.9

Q.What is the percentage of correct classification of non-buyers with respect to total non-buyers?

Ans.Recall of non-buyers

ie,

(75)/(75+6)=>0.93

Q.What is the percentage of correct classification of buyers with respect to total buyers?

Ans.Recall of buyers

ie,

(45)/(53)=>0.85

Q.What is the percentage of correct classification of non-buyers with respect to all classification of non-buyers?

Ans. Precision of non-buyers

ie,

(75)/(75+8)=>0.90

Q. What is the percentage of correct classification of buyers with respect to all classification of buyers?

Ans.Precision of buyers

ie,

(45)/(45+6)=>0.88

F1 value of Buyers = 2*precision* recall /recall+precison = 2*0..85*0.88/(0.85+.88)=1.496/1.73=0.87

F1 value of Non-Buyers = 2*precision* recall /recall+precison = 2*0.93*0.9/(0.93+.9)=1.674/1.83=0.91

Q.Marco-average of Precision:

Ans:Average of Precision = (0.9+0.88)/2=1.78/2=0.89

Q.Weighted Average of Precision:

Ans: To standardize data

((Precision(Buyers)*No of Buyers)/Total Users)+ ((Precision(Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.88*53/134)+(0.9*81/134)=0.35+0.54=0.90

Q.Marco-average of Recall:

Ans:Average of Recall = (0.93+0.85)/2=1.78/2=0.89

Q.Weighted Average of Recall:

Ans: To standardize data

((Recall (Buyers)*No of Buyers)/Total Users)+ ((Recall (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.85*53/134)+(0.93*81/134)=0.34+0.56=0.90

Q.Marco-average of F1 value:

Ans:Average of F1 value = (0.86+0.93)/2=1.79/2=0.895

Q.Weighted Average of F1 value:

Ans: To standardize data

((F1 value (Buyers)*No of Buyers)/Total Users)+ ((F1 value (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.86*53/134)+(0.93*81/134)0.34+0.56=0.9

Support Vector Machine

Q.What is the percentage of correct classification of both with respect to total data?

Ans.Accuracy is (78+20)/(78+20+33+3) = 98/134 =0.73

Q.What is the percentage of correct classification of non-buyers with respect to total non-buyers?

Ans.Recall of non-buyers

ie,

(78)/(78+3)=>0.96

Q.What is the percentage of correct classification of buyers with respect to total buyers?

Ans.Recall of buyers

ie,

(20)/(53)=>0.38

Q.What is the percentage of correct classification of non-buyers with respect to all classification of non-buyers?

Ans. Precision of non-buyers

ie,

(78)/(78+33)=>0.70

Q. What is the percentage of correct classification of buyers with respect to all classification of buyers?

Ans.Precision of buyers

ie,

(20)/(20+3)=>0.87

F1 value of Buyers = 2*precision* recall /recall+precison = 2*0.87*0.38/(0.87+.38)=0.6612/1.25=0.53

F1 value of Non Buyers = 2*precision* recall /recall+precison = 2*0.7*0.96/(0.7+.96)=1.344/1.66=0.81

Q.Marco-average of Precision:

Ans:Average of Precision = (0.87+0.70)/2=1.57/2=0.79

Q.Weighted Average of Precision:

Ans: To standardize data

((Precision(Buyers)*No of Buyers)/Total Users)+ ((Precision(Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.87*53/134)+(0.70*81/134)=0.34411+0.423134=0.77

Q.Marco-average of Recall:

Ans:Average of Recall = (0.96+0.38)/2=1.34/2=0.67

Q.Weighted Average of Recall:

Ans: To standardize data

((Recall (Buyers)*No of Buyers)/Total Users)+ ((Recall (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.38*53/134)+(0.96*81/134)=0.15+0.58=0.73

Q.Marco-average of F1 value:

Ans:Average of F1 value = (0.52+0.81)/2=1.33/2=0.67

Q.Weighted Average of F1 value:

Ans: To standardize data

((F1 value (Buyers)*No of Buyers)/Total Users)+ ((F1 value (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.52*53/134)+(0.81*81/134)=0.21+0.49=0.7

Logistic Classifier

Q.What is the percentage of correct classification of both with respect to total data?

Ans.Accuracy is (71+32)/(71+2+15+32) = 103/120 =0.86

Q.What is the percentage of correct classification of non-buyers with respect to non-buyers?

Ans.Recall of non-buyers

ie,

(71)/(71+2)=>0.97

Q.What is the percentage of correct classification of buyers with respect to total buyers?

Ans.Recall of buyers

ie,

(32)/(47)=>0.68

Q.What is the percentage of correct classification of non-buyers with respect to all classification of non-buyers?

Ans. Precision of non-buyers

ie,

(71)/(71+15)=>0.83

Q. What is the percentage of correct classification of buyers with respect to all classification of buyers?

Ans.Precision of buyers

ie,

(32)/(34)=>0.94

F1 value of Buyers = 2*precision*accuracy/recall+precison = 2*0.94*0.68/(0. 94+.68)=1.2784/1.62=0.79

F1 value of Non Buyers = 2*precision*accuracy/recall+precison =2 *.97*0.83/(0.97+.83)=1.6102/1.8=0.89

Q.Marco-average of Precision:

Ans:Average of Precision = (0.83+0.94)/2=1.77/2=0.885

Q.Weighted Average of Precision:

Ans: To standardize data

((Precision(Buyers)*No of Buyers)/Total Users)+ ((Precision(Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.83*73/120)+(0.94*47/120)=0.87

Q.Marco-average of Recall:

Ans:Average of Recall = (0.97+0.68)/2=1.65/2=0.83

Q.Weighted Average of Recall:

Ans: To standardize data

((Recall (Buyers)*No of Buyers)/Total Users)+ ((Recall (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.97*73/120)+(0.68*47/120)=0.86

Q.Marco-average of F1 value:

Ans:Average of F1 value = (0.89+0.79)/2=0.84

Q.Weighted Average of F1 value:

Ans: To standardize data

((F1 value (Buyers)*No of Buyers)/Total Users)+ ((F1 value (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.89*73/120)+(0.79*47/120)=0.85

K Nearest Neighbour Classifier

Q.What is the percentage of correct classification of both with respect to total data?

Ans.Accuracy is (74+35)/(74+11+14+35) = 109/134 =0.81

Q.What is the percentage of correct classification of non-buyers with respect to non-buyers?

Ans.Recall of non-buyers

ie,

(74)/(85)=>0.87

Q.What is the percentage of correct classification of buyers with respect to total buyers?

Ans.Recall of buyers

ie,

(35)/(49)=>0.71

Q.What is the percentage of correct classification of non-buyers with respect to all classification of non-buyers?

Ans. Precision of non-buyers

ie,

(74)/(88)=>0.84

Q. What is the percentage of correct classification of buyers with respect to all classification of buyers?

Ans.Precision of buyers

ie,

(35)/(46)=>0.76

F1 value of Buyers = 2*precision*accuracy/recall+precison = 2*0.76*0.71/(0. 76+.71)=0.74

F1 value of Non Buyers = 2*precision*accuracy/recall+precison =2 *.84*0.87/(0.84+.87)= 0.86

Q.Marco-average of Precision:

Ans:Average of Precision = (0.84+0.76)/2=0.8

Q.Weighted Average of Precision:

Ans: To standardize data

((Precision(Buyers)*No of Buyers)/Total Users)+ ((Precision(Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.84*85/134)+(0.76*49/134)=0.81

Q.Marco-average of Recall:

Ans:Average of Recall = (0.87+0.71)/2=0.79

Q.Weighted Average of Recall:

Ans: To standardize data

((Recall (Buyers)*No of Buyers)/Total Users)+ ((Recall (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.87*85/134)+(0.71*49/134)=0.81

Q.Marco-average of F1 value:

Ans:Average of F1 value = (0.86+0.74)/2=0.8

Q.Weighted Average of F1 value:

Ans: To standardize data

((F1 value (Buyers)*No of Buyers)/Total Users)+ ((F1 value (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.86*85/134)+(0.74*49/134)=0.81

Naïve Bayes Classifier-Gaussian NB

Q.What is the percentage of correct classification of both with respect to total data?

Ans.Accuracy is (80+41)/(80+5+8+41) = 121/134 =0.9

Q.What is the percentage of correct classification of non-buyers with respect to non-buyers?

Ans.Recall of non-buyers

ie,

(80)/(85)=>0.94

Q.What is the percentage of correct classification of buyers with respect to total buyers?

Ans.Recall of buyers

ie,

(41)/(49)=>0.84

Q.What is the percentage of correct classification of non-buyers with respect to all classification of non-buyers?

Ans. Precision of non-buyers

ie,

(80)/(88)=>0.91

Q. What is the percentage of correct classification of buyers with respect to all classification of buyers?

Ans.Precision of buyers

ie,

(41)/(46)=>0.89

F1 value of Buyers = 2*precision*accuracy/recall+precison = 2*0.89*0.84/(0. 89+.84)=0.86

F1 value of Non Buyers = 2*precision*accuracy/recall+precison =2*0.91*0.94/(0. 91+.94)=0.92

Q.Marco-average of Precision:

Ans:Average of Precision = (0.91+0.89)/2=0.9

Q.Weighted Average of Precision:

Ans: To standardize data

((Precision(Buyers)*No of Buyers)/Total Users)+ ((Precision(Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.91*85/134)+(0.89*49/134)=0.90

Q.Marco-average of Recall:

Ans:Average of Recall = (0.94+0.84)/2=0.89

Q.Weighted Average of Recall:

Ans: To standardize data

((Recall (Buyers)*No of Buyers)/Total Users)+ ((Recall (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.94*85/134)+(0.84*49/134)=0.90

Q.Marco-average of F1 value:

Ans:Average of F1 value = (0.92+0.86)/2=0.89

Q.Weighted Average of F1 value:

Ans: To standardize data

((F1 value (Buyers)*No of Buyers)/Total Users)+ ((F1 value (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.92*85/134)+(0.86*49/134)=0.90

Naïve Bayes Classifier- Multinomial NB

Q.What is the percentage of correct classification of both with respect to total data?

Ans.Accuracy is 85/(85+49)= 85/134 =0.63

Q.What is the percentage of correct classification of non-buyers with respect to non-buyers?

Ans.Recall of non-buyers

ie,

(85)/(85)=>1

Q.What is the percentage of correct classification of buyers with respect to total buyers?

Ans.Recall of buyers

ie,

(49)/(0)=>0

Q.What is the percentage of correct classification of non-buyers with respect to all classification of non-buyers?

Ans. Precision of non-buyers

ie,

(85)/(134)=>0.63

Q. What is the percentage of correct classification of buyers with respect to all classification of buyers?

Ans.Precision of buyers

ie,

(0)/(0)=>0

F1 value of Buyers = 2*precision*accuracy/recall+precison = 2*0.0*0.0/(0. 0+.0)=0.00

F1 value of Non Buyers = 2*precision*accuracy/recall+precison =2*1*0.63/(0. 63+1)=0.78

Q.Marco-average of Precision:

Ans:Average of Precision = (0.63+0.0)/2=0.32

Q.Weighted Average of Precision:

Ans: To standardize data

((Precision(Buyers)*No of Buyers)/Total Users)+ ((Precision(Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.63*85/134)+(0.0*49/134)=0.40

Q.Marco-average of Recall:

Ans:Average of Recall = (1 +0)/2=0.50

Q.Weighted Average of Recall:

Ans: To standardize data

((Recall (Buyers)*No of Buyers)/Total Users)+ ((Recall (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(1*85/134)+(0*49/134)=0.63

Q.Marco-average of F1 value:

Ans:Average of F1 value = (0.78+0)/2=0.39

Q.Weighted Average of F1 value:

Ans: To standardize data

((F1 value (Buyers)*No of Buyers)/Total Users)+ ((F1 value (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.78*85/134)+(0*49/134)=0.49

Naïve Bayes Classifier- Complement NB

Q.What is the percentage of correct classification of both with respect to total data?

Ans.Accuracy is (40+29)/(40+20+45+29)= 69/134 =0.51

Q.What is the percentage of correct classification of non-buyers with respect to non-buyers?

Ans.Recall of non-buyers

ie,

(40)/(85)=>0.47

Q.What is the percentage of correct classification of buyers with respect to total buyers?

Ans.Recall of buyers

ie,

(29)/(49)=>0.59

Q.What is the percentage of correct classification of non-buyers with respect to all classification of non-buyers?

Ans. Precision of non-buyers

ie,

(40)/(60)=>0.67

Q. What is the percentage of correct classification of buyers with respect to all classification of buyers?

Ans.Precision of buyers

ie,

(29)/(74)=>0.39

F1 value of Buyers = 2*precision*accuracy/recall+precison = 2*0.39*0.59/(0.39+0.59)=46.02/0.98=0.47

F1 value of Non Buyers = 2*precision*accuracy/recall+precison =2*0.67*0.47/(0. 67+0.47)=/1.14=0.55

Q.Marco-average of Precision:

Ans:Average of Precision = (0.67+0.39)/2=0.53

Q.Weighted Average of Precision:

Ans: To standardize data

((Precision(Buyers)*No of Buyers)/Total Users)+ ((Precision(Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.67*85/134)+(0.39*49/134)=0.57

Q.Marco-average of Recall:

Ans:Average of Recall = (0.47 +0.59)/2=0.53

Q.Weighted Average of Recall:

Ans: To standardize data

((Recall (Buyers)*No of Buyers)/Total Users)+ ((Recall (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.59*85/134)+(0.47*49/134)=0.51

Q.Marco-average of F1 value:

Ans:Average of F1 value = (0.55+0.47)/2=0.51

Q.Weighted Average of F1 value:

Ans: To standardize data

((F1 value (Buyers)*No of Buyers)/Total Users)+ ((F1 value (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.55*85/134)+(0.47*49/134)=0.52

Naïve Bayes Classifier- Bernoulli NB

Q.What is the percentage of correct classification of both with respect to total data?

Ans.Accuracy is (85)/(85+49)= 85/134 =0.63

Q.What is the percentage of correct classification of non-buyers with respect to non-buyers?

Ans.Recall of non-buyers

ie,

(85)/(85)=>1

Q.What is the percentage of correct classification of buyers with respect to total buyers?

Ans.Recall of buyers

ie,

(0)/(49)=>0

Q.What is the percentage of correct classification of non-buyers with respect to all classification of non-buyers?

Ans. Precision of non-buyers

ie,

(85)/(134)=>0.63

Q. What is the percentage of correct classification of buyers with respect to all classification of buyers?

Ans.Precision of buyers

ie,

(0)/(0)=>0

F1 value of Buyers = 2*precision*accuracy/recall+precison = 2*0. *0/(0.+0)=0

F1 value of Non Buyers = 2*precision*accuracy/recall+precison =2*1*0.63/(1+0.63)=0.78

Q.Marco-average of Precision:

Ans:Average of Precision = (0.63+0)/2=0.32

Q.Weighted Average of Precision:

Ans: To standardize data

((Precision(Buyers)*No of Buyers)/Total Users)+ ((Precision(Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.63*85/134)+(0.0*49/134)=0.4

Q.Marco-average of Recall:

Ans:Average of Recall = (1 +0)/2=0.5

Q.Weighted Average of Recall:

Ans: To standardize data

((Recall (Buyers)*No of Buyers)/Total Users)+ ((Recall (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(1*85/134)+(0*49/134)=0.63

Q.Marco-average of F1 value:

Ans:Average of F1 value = (0.78+0)/2=0.39

Q.Weighted Average of F1 value:

Ans: To standardize data

((F1 value (Buyers)*No of Buyers)/Total Users)+ ((F1 value (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.78*85/134)+(0.0*49/134)=0.49

Naïve Bayes Classifier- Categorical NB

Q.What is the percentage of correct classification of both with respect to total data?

Ans.Accuracy is (82+31)/(82+31+3+18)= 113/134 =0.84

Q.What is the percentage of correct classification of non-buyers with respect to non-buyers?

Ans.Recall of non-buyers

ie,

(82)/(85)=>0.96

Q.What is the percentage of correct classification of buyers with respect to total buyers?

Ans.Recall of buyers

ie,

(31)/(49)=>0.63

Q.What is the percentage of correct classification of non-buyers with respect to all classification of non-buyers?

Ans. Precision of non-buyers

ie,

(82)/(100)=>0.82

Q. What is the percentage of correct classification of buyers with respect to all classification of buyers?

Ans.Precision of buyers

ie,

(31)/(34)=>0.91

F1 value of Buyers = 2*precision*accuracy/recall+precison = 2*91 *0.63/(0.91+0.63)=0.75

F1 value of Non Buyers = 2*precision*accuracy/recall+precison =2*0.82*0.96/(.82+0.96)=0.89

Q.Marco-average of Precision:

Ans:Average of Precision = (0.82+0.91)/2=0.87

Q.Weighted Average of Precision:

Ans: To standardize data

((Precision(Buyers)*No of Buyers)/Total Users)+ ((Precision(Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.82*85/134)+(0.91*49/134)=0.85

Q.Marco-average of Recall:

Ans:Average of Recall = (0.96 +0.63)/2=0.8

Q.Weighted Average of Recall:

Ans: To standardize data

((Recall (Buyers)*No of Buyers)/Total Users)+ ((Recall (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.96*85/134)+(0.63*49/134)=0.84

Q.Marco-average of F1 value:

Ans:Average of F1 value = (0.89+0.75)/2=0.82

Q.Weighted Average of F1 value:

Ans: To standardize data

((F1 value (Buyers)*No of Buyers)/Total Users)+ ((F1 value (Non-Buyers)*No of Non-Buyers)/Total Users))

ie,

(0.89*85/134)+(0.75*49/134)=0.84

Metric	Random Forest	Decision Tree	SVM	Logistic Regression	KNN	Gaussian NB	Multinomial NB	Complement NB	Bernoulli NB	Categorical NB
Accuracy	0.91	0.9	0.73	0.86	0.81	0.9	0.63	0.51	0.63	0.84
Recall (Non-Buyers)	0.92	0.93	0.96	0.97	0.87	0.94	1	0.47	1	0.96
Recall (Buyers)	0.9	0.85	0.38	0.68	0.71	0.84	0	0.59	0	0.63
Precision (Non-Buyers)	0.94	0.9	0.7	0.83	0.84	0.91	0.63	0.67	0.63	0.82
Precision (Buyers)	0.86	0.88	0.87	0.94	0.76	0.89	0	0.39	0	0.91
F1 (Buyers)	0.88	0.87	0.53	0.79	0.74	0.86	0	0.47	0	0.75
F1 (Non-Buyers)	0.93	0.91	0.81	0.89	0.86	0.92	0.78	0.55	0.78	0.89
Macro Avg Precision	0.9	0.89	0.79	0.89	0.8	0.9	0.32	0.53	0.32	0.87
Weighted Avg Precision	0.91	0.9	0.77	0.87	0.81	0.9	0.4	0.57	0.4	0.85
Macro Avg Recall	0.91	0.89	0.67	0.83	0.79	0.89	0.5	0.53	0.5	0.8
Weighted Avg Recall	0.91	0.9	0.73	0.86	0.81	0.9	0.63	0.51	0.63	0.84
Macro Avg F1	0.905	0.895	0.67	0.84	0.8	0.89	0.39	0.51	0.39	0.82
Weighted Avg F1	0.91	0.9	0.7	0.85	0.81	0.9	0.49	0.52	0.49	0.84