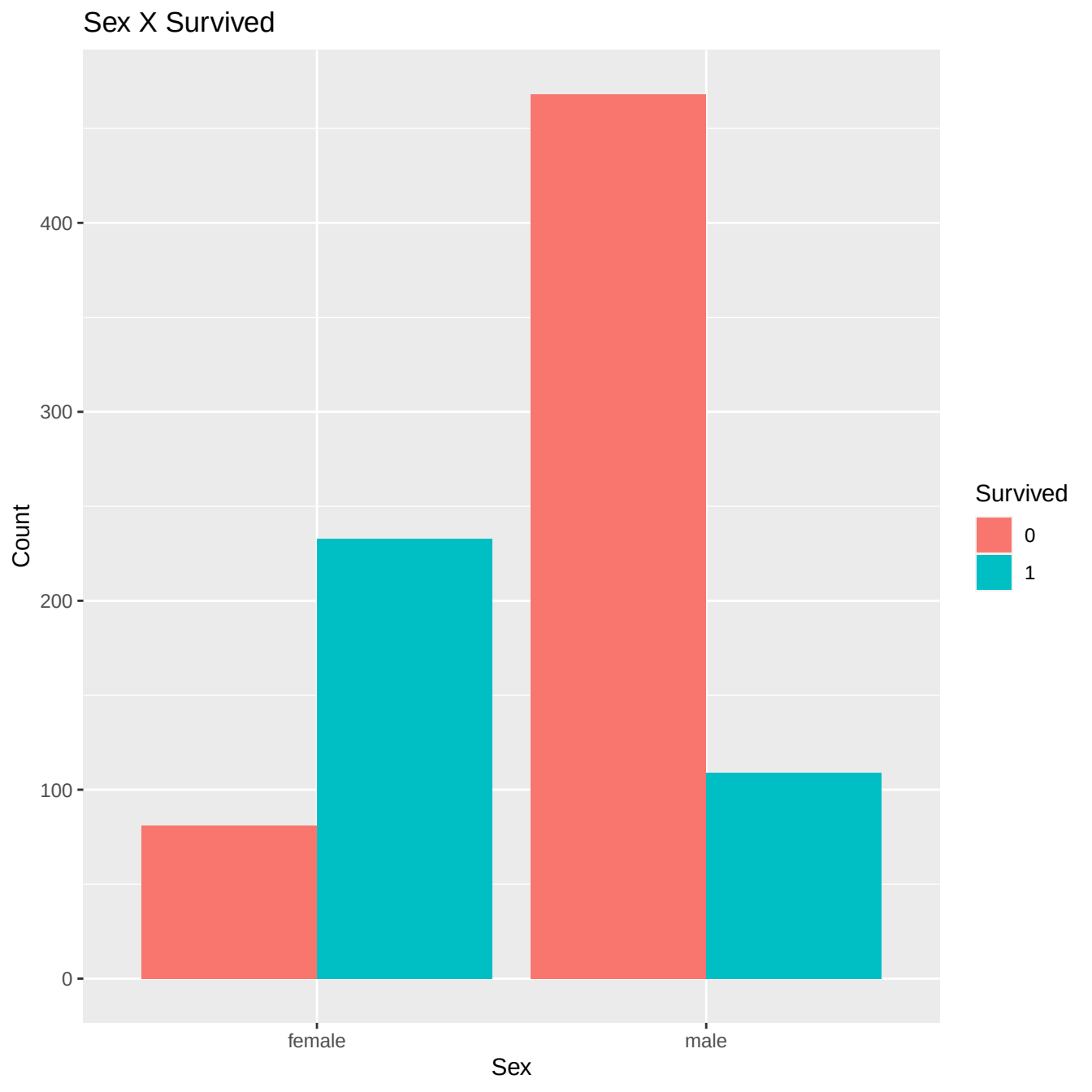
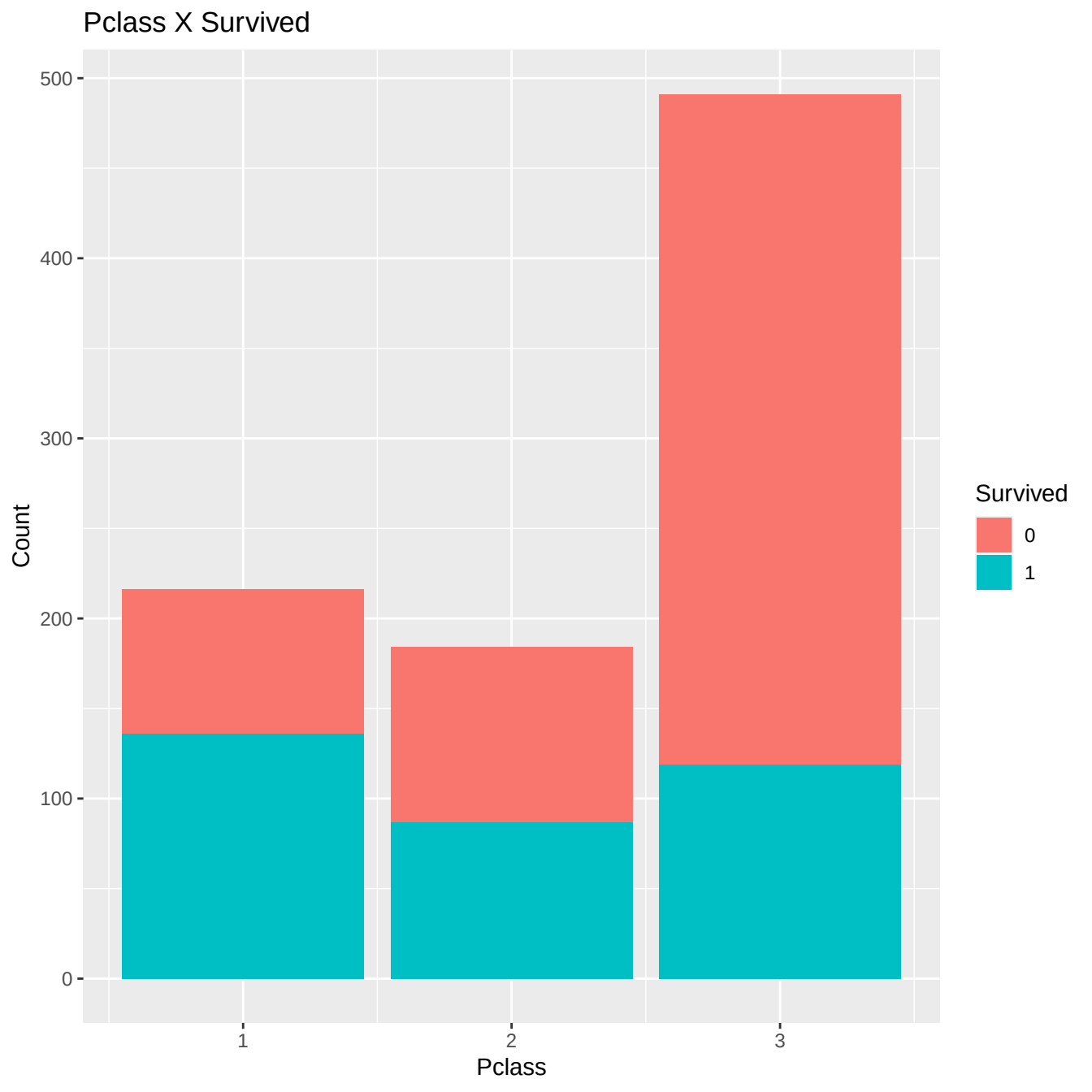
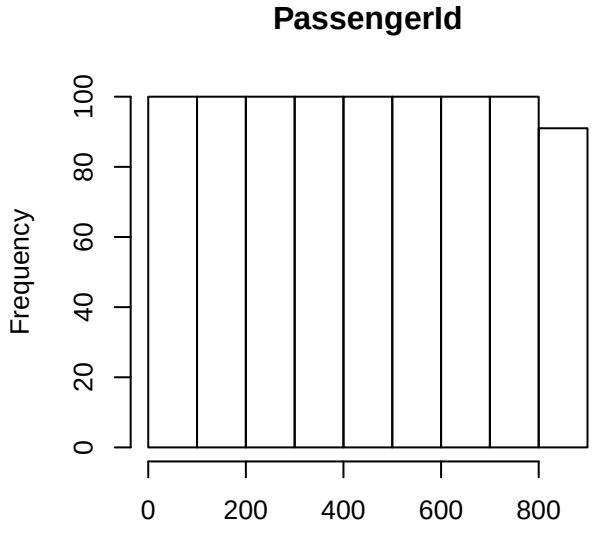
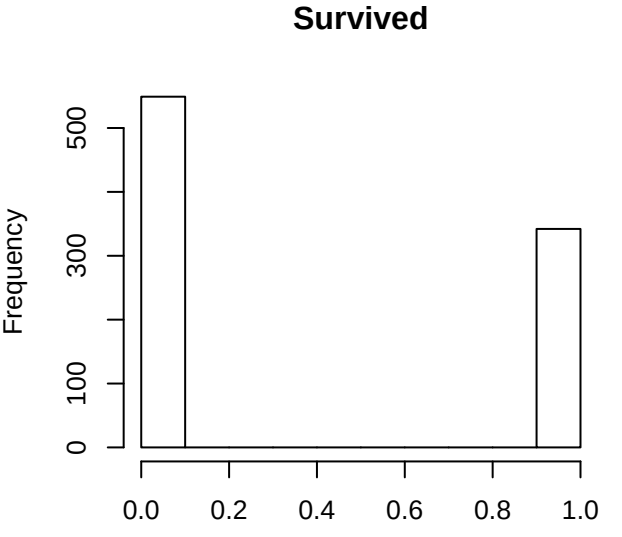
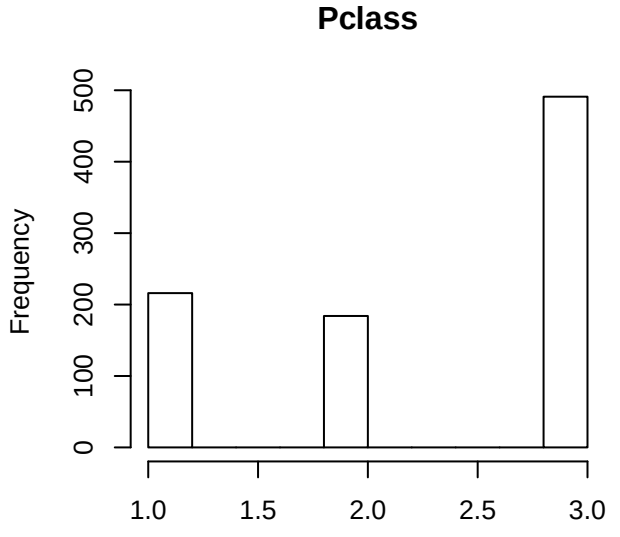
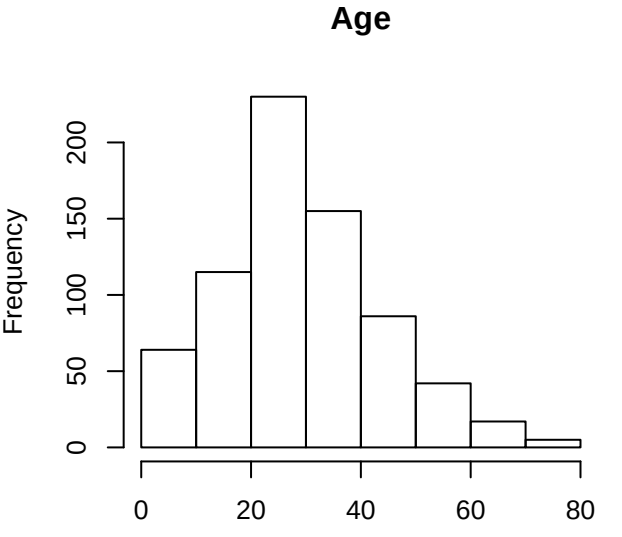

Sex X Survived
Count
400
300
200
100
0
female
male
Sex
Survived
0
1

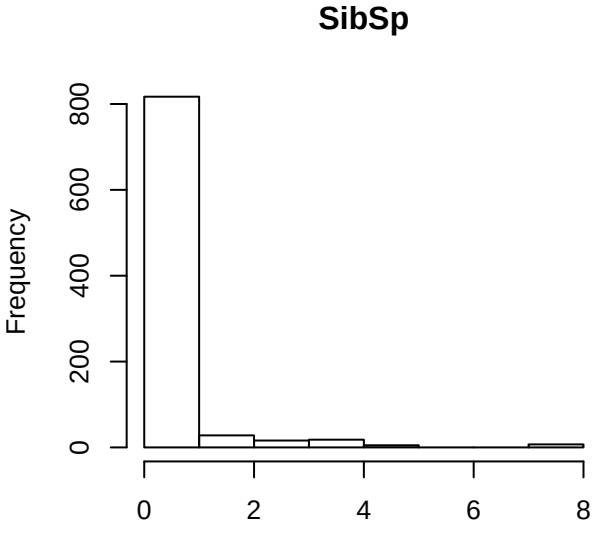

Pclass X Survived
500
400
300
200
100
0
Count
1
2
3
Pclass
Survived
0
1

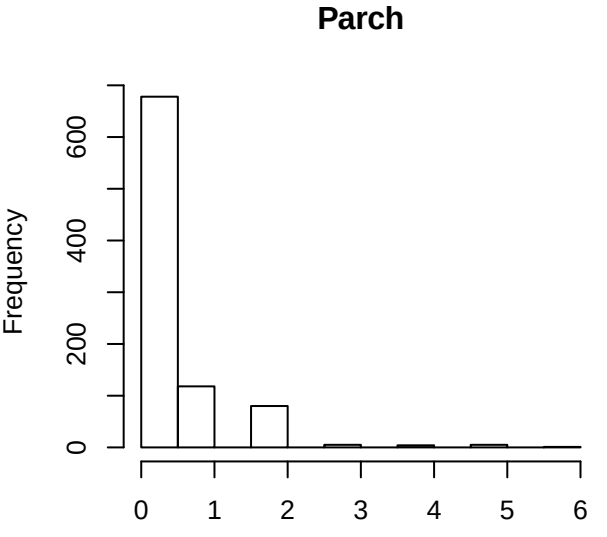

PassengerId
Frequency
0
20
40
60
80
100
0
200
400
600
800

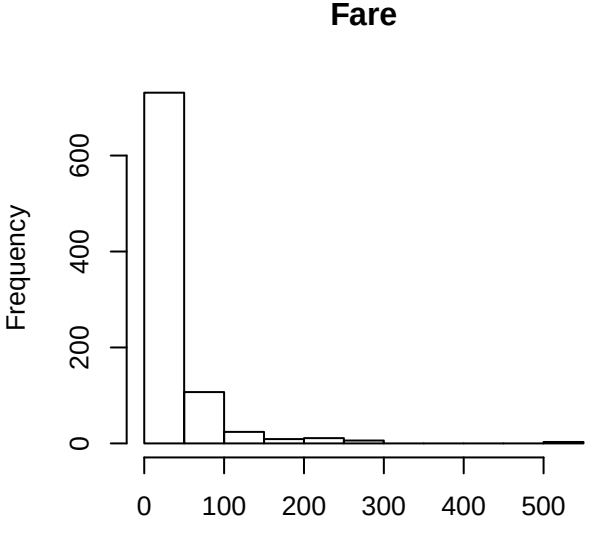

Survived
Frequency
0
100
300
500
0.0
0.2
0.4
0.6
0.8
1.0

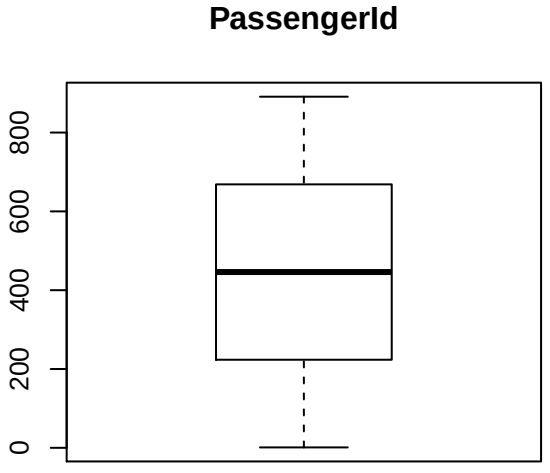

Pclass
Frequency
0
100
200
300
400
500
1.0
1.5
2.0
2.5
3.0

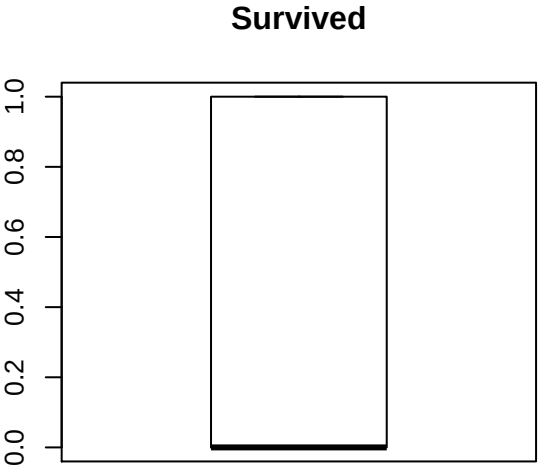

Age
Frequency
0
50
100
150
200
0
20
40
60
80

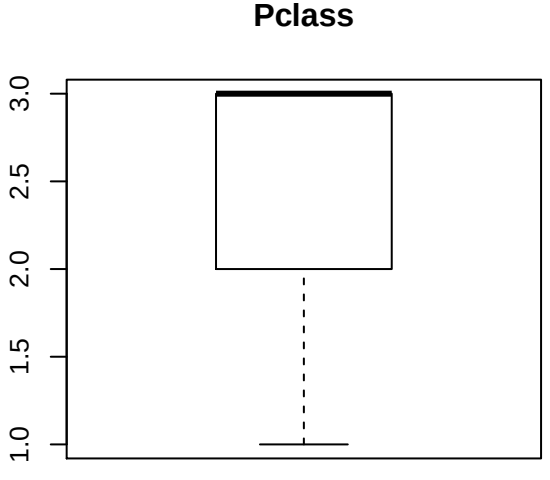

SibSp
Frequency
0
200
400
600
800
0
2
4
6
8


Parch
Frequency
0
200
400
600
0
1
2
3
4
5
6

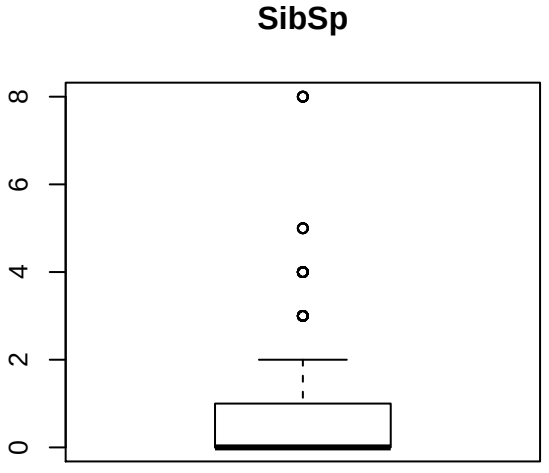

Fare
Frequency
0
200
400
600
0
100
200
300
400
500

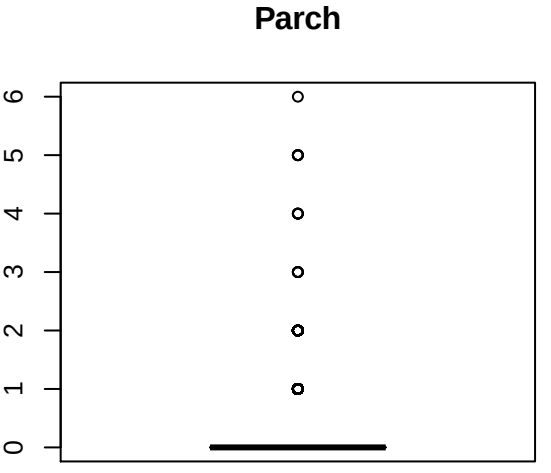

PassengerId
0
200
400
600
800

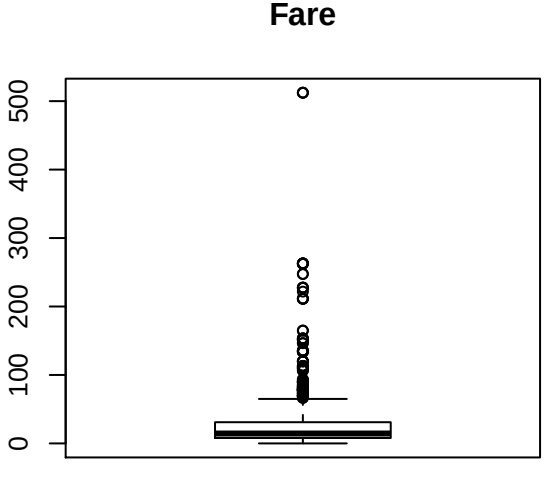

Survived
0.0
0.2
0.4
0.6
0.8
1.0

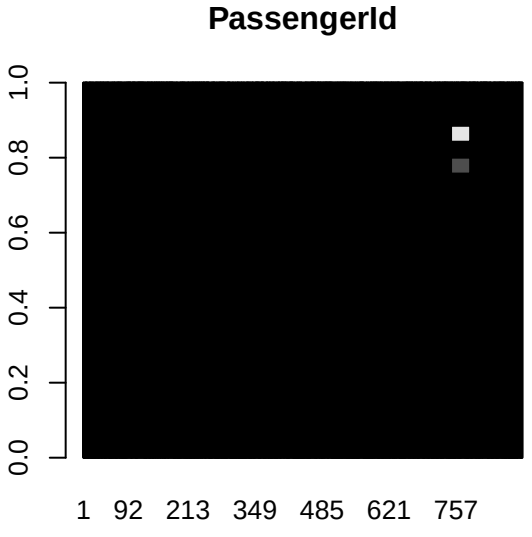

Pclass
1.0
1.5
2.0
2.5
3.0

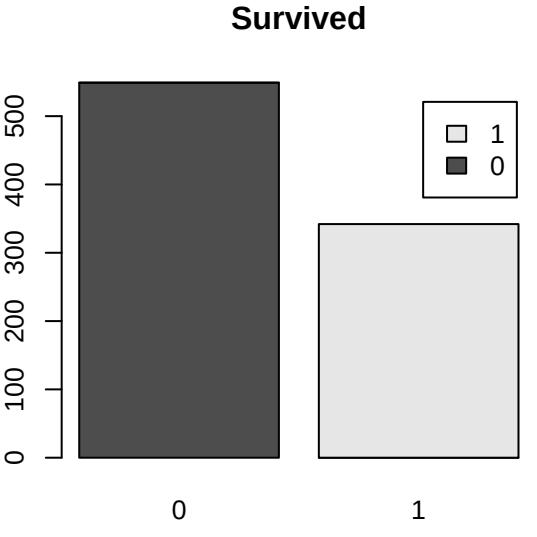
Age
0
20
40
60
80

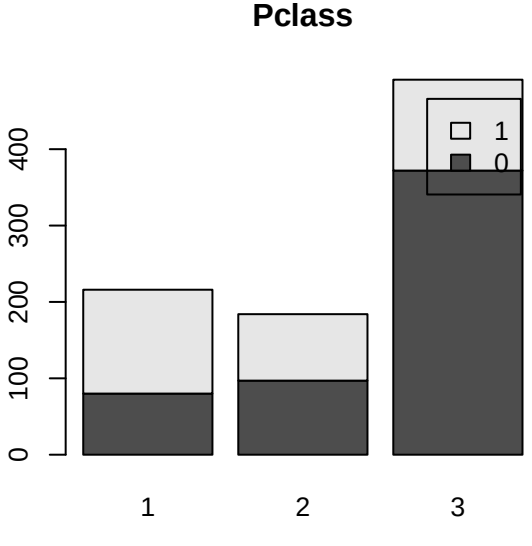

SibSp
0
2
4
6
8

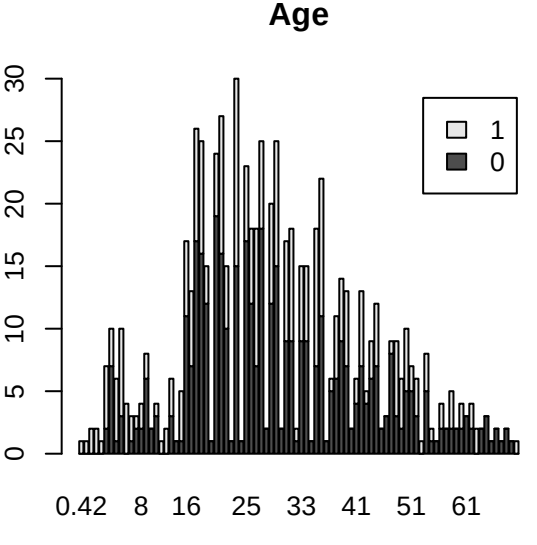

Parch
0
1
2
3
4
5
6


Fare
0
100
200
300
400
500


PassengerId
0.0
0.2
0.4
0.6
0.8
1.0
1
92
213
349
485
621
757


Survived
0
100
200
300
400
500
1
0
0
1


Pclass
0
100
200
300
400
1
0
1
2
3


Age
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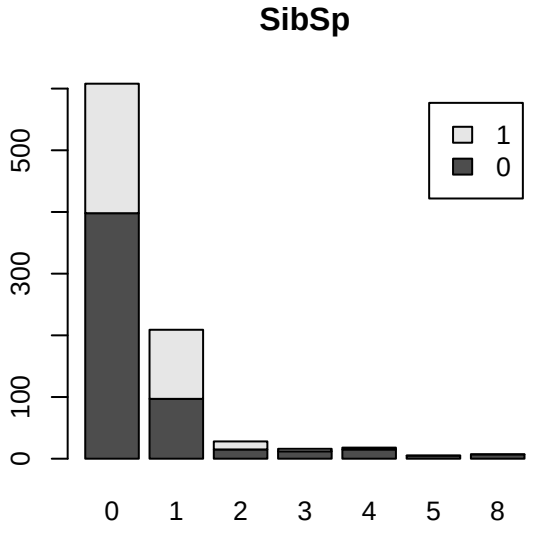
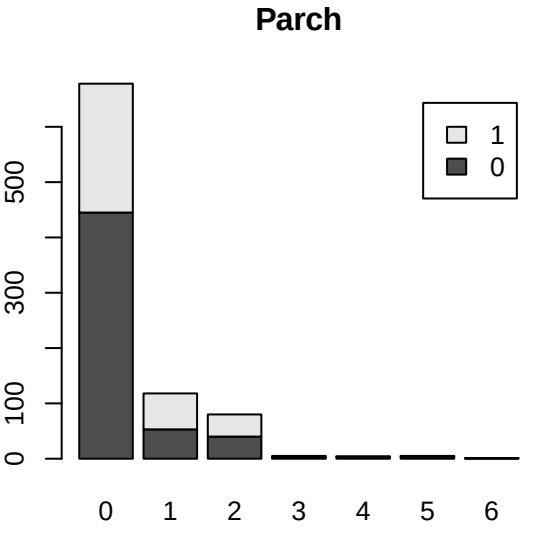
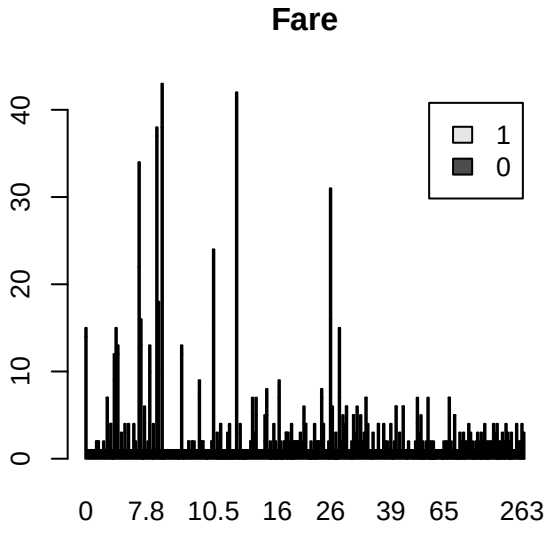
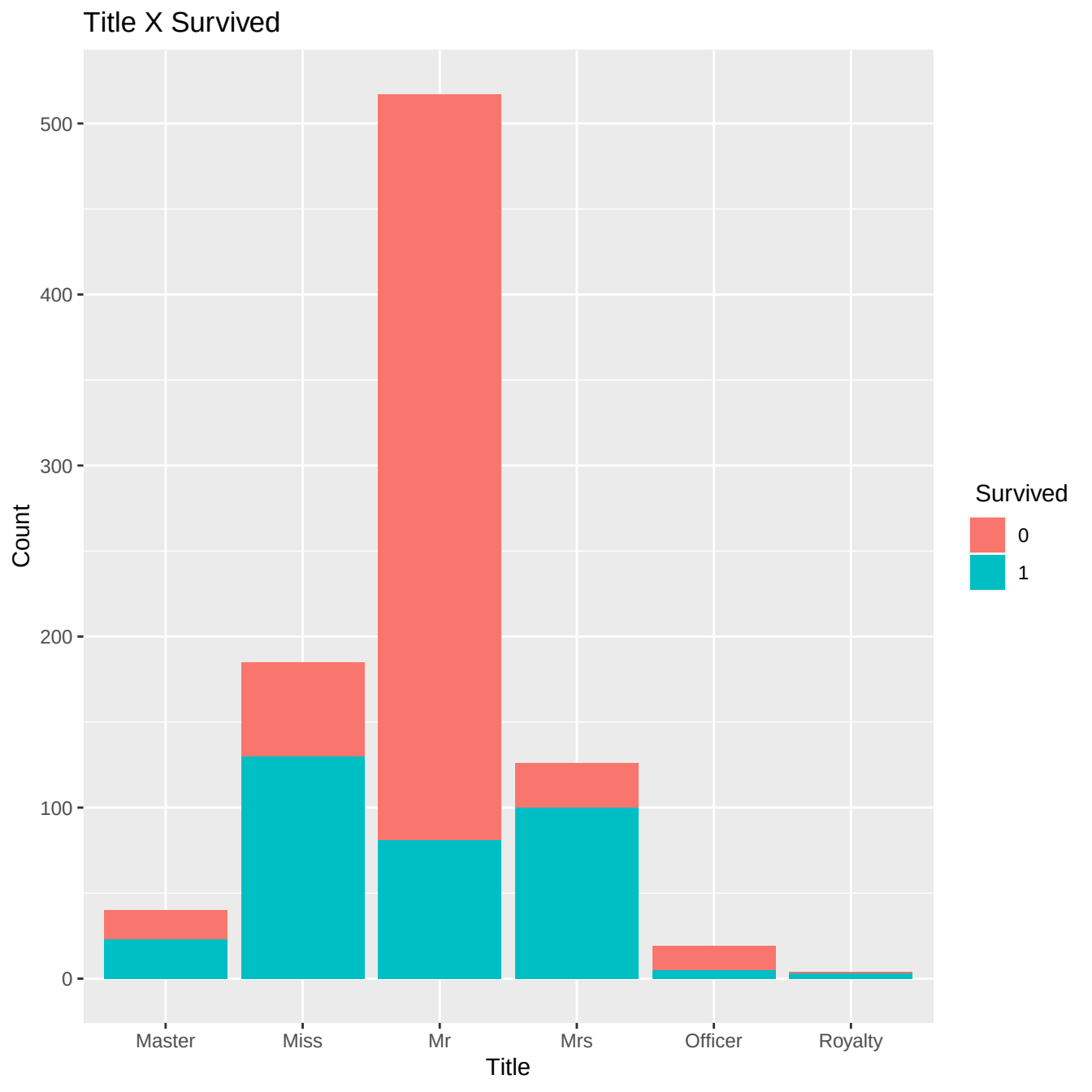
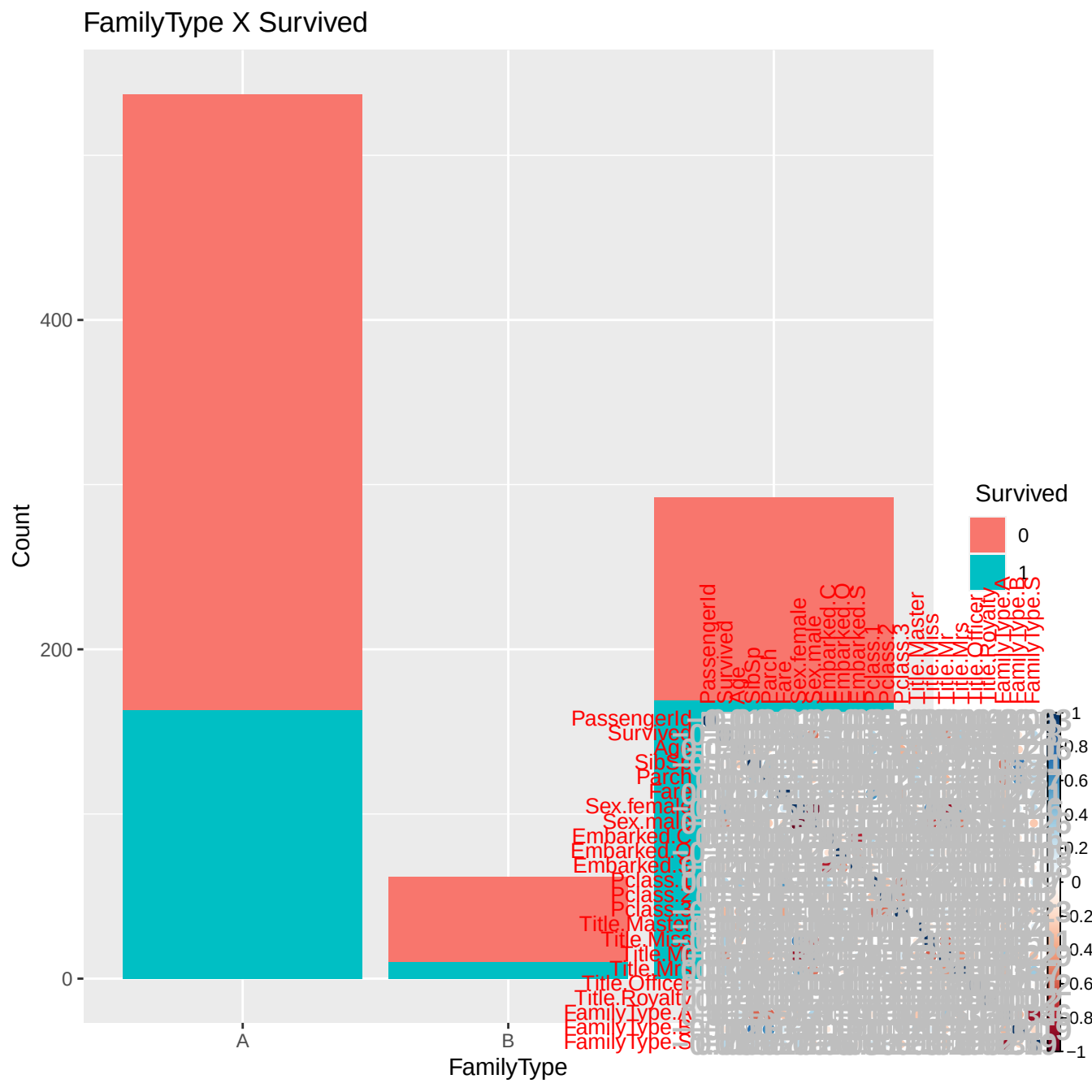
5
10
15
20
25
30
1
0
0.42
8
16
25
33
41
51
61

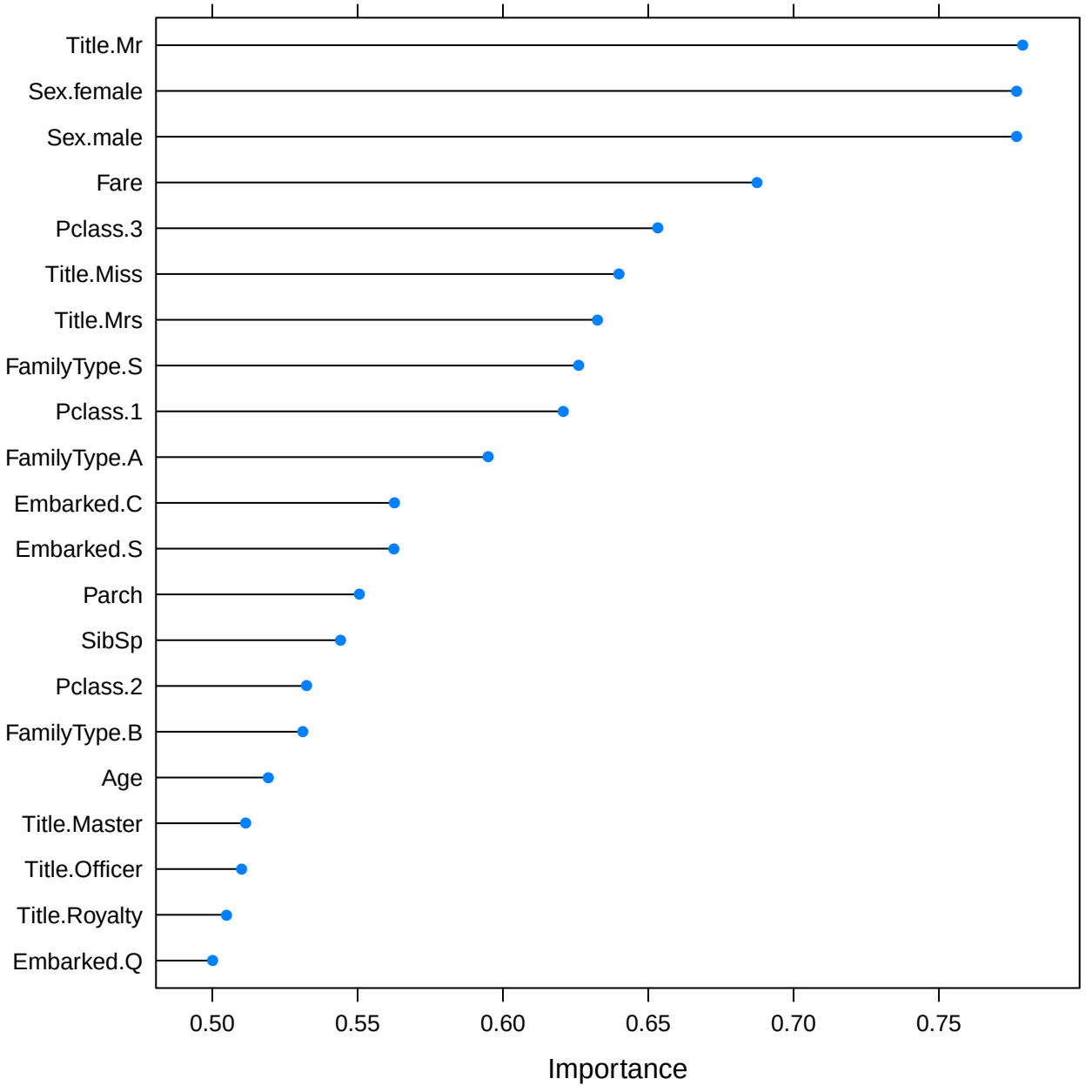

SibSp
1
0
0
100
300
500
0
1
2
3
4
5
8

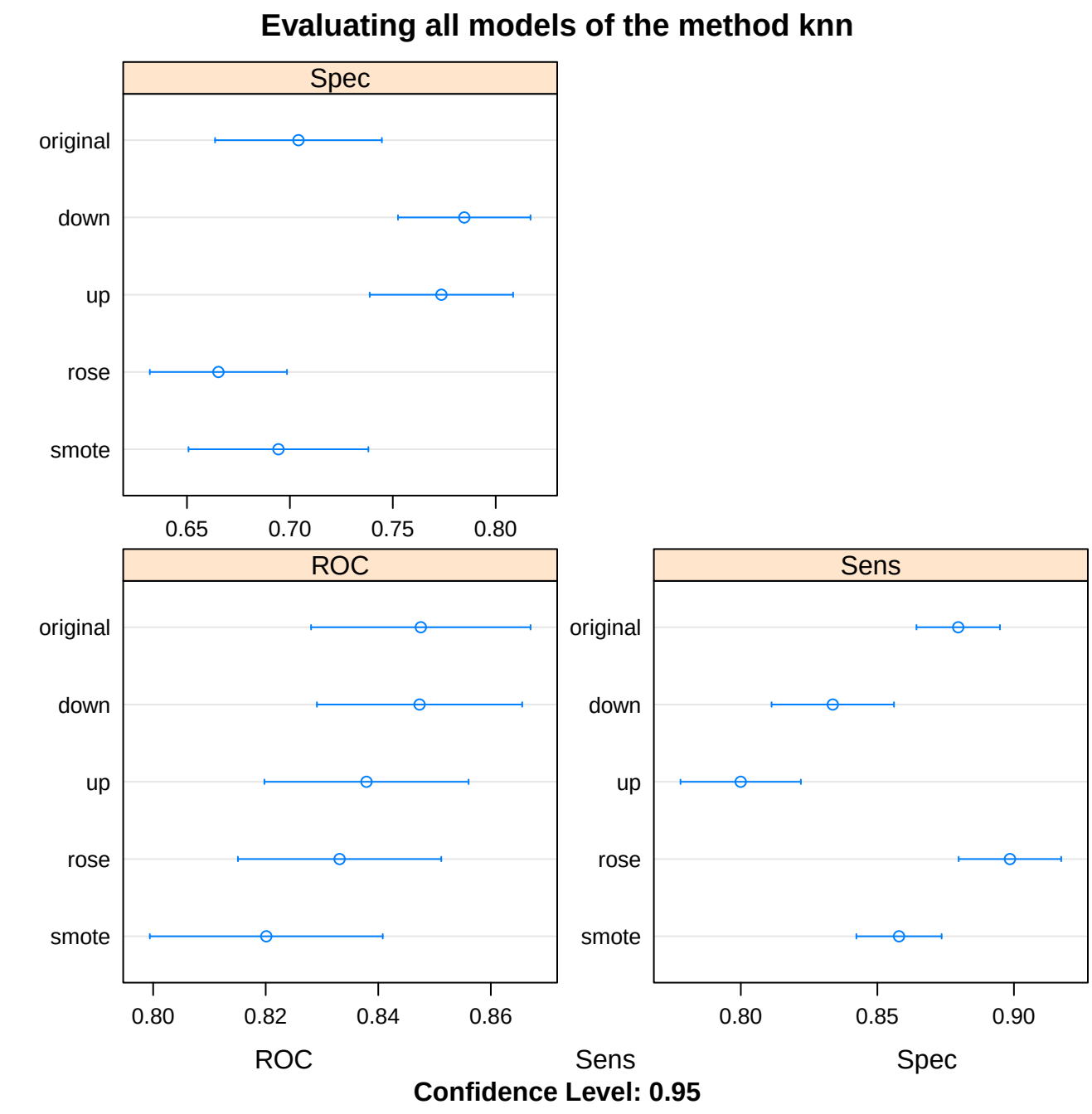

Parch
1
0
0
100
300
500
0
1
2
3
4
5
6

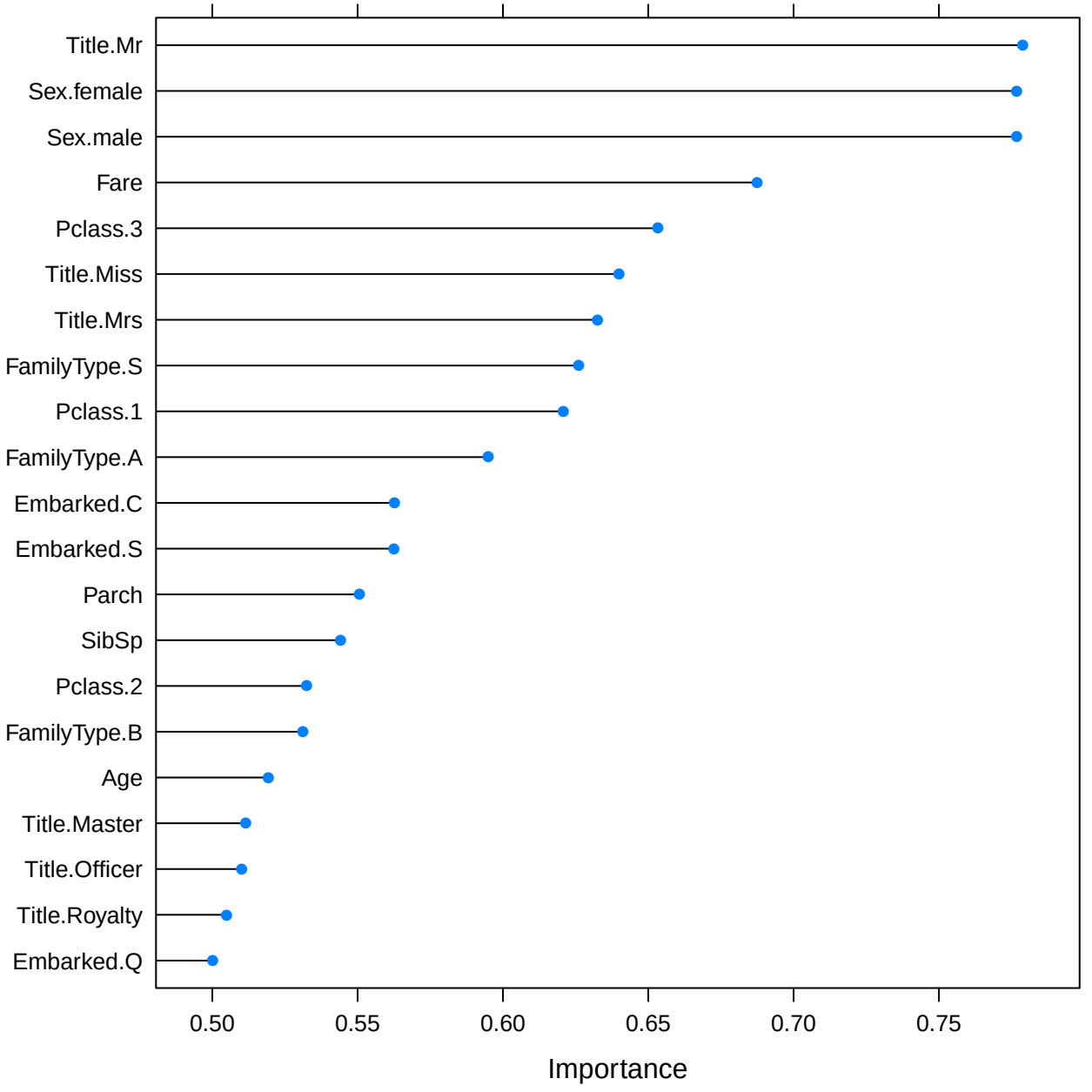

Fare
1
0
0
10
20
30
40
0
7.8
10.5
16
26
39
65
263

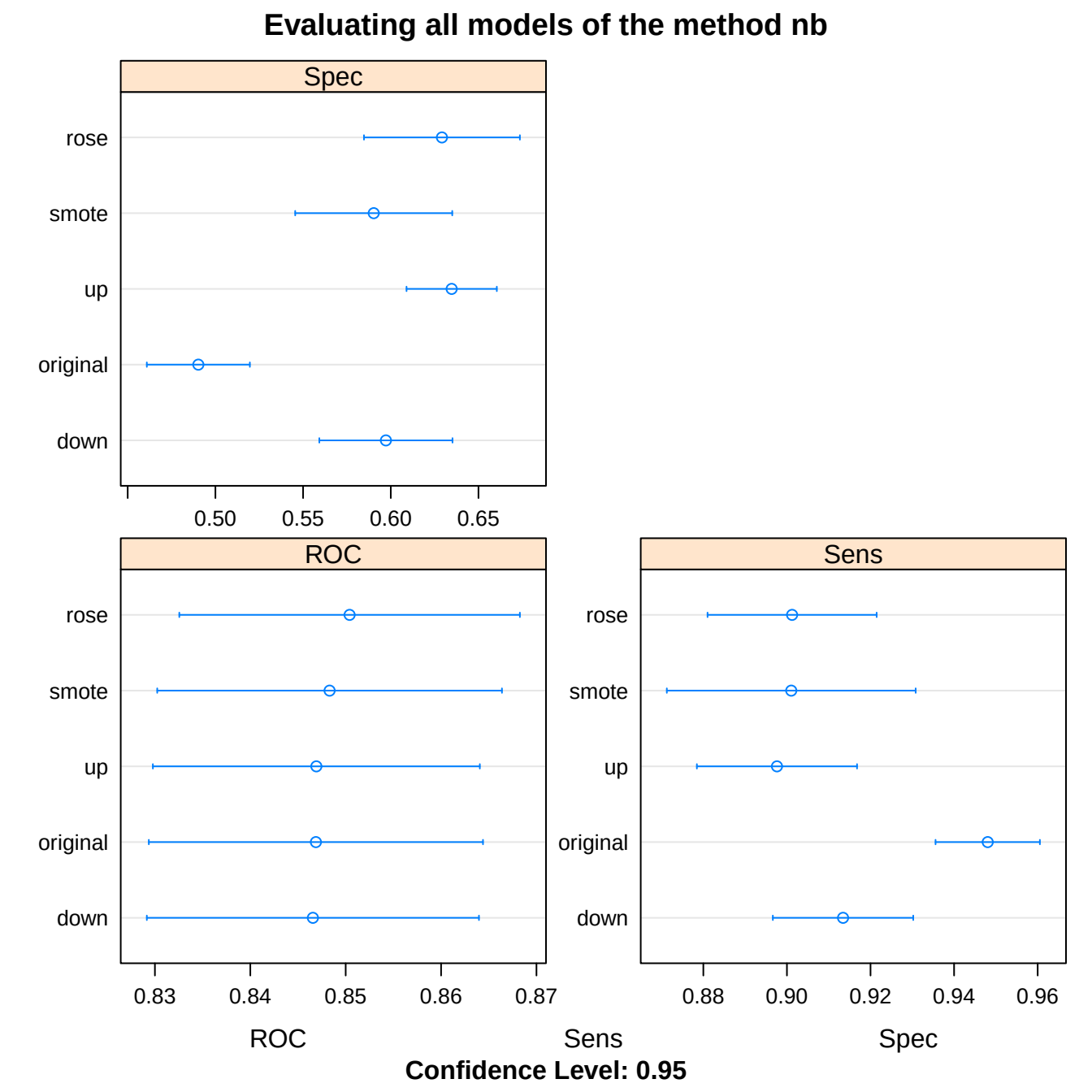

Title X Survived
Count
500
400
300
200
100
0
Master
Miss
Mr
Mrs
Officer
Royalty
Title
Survived
0
1

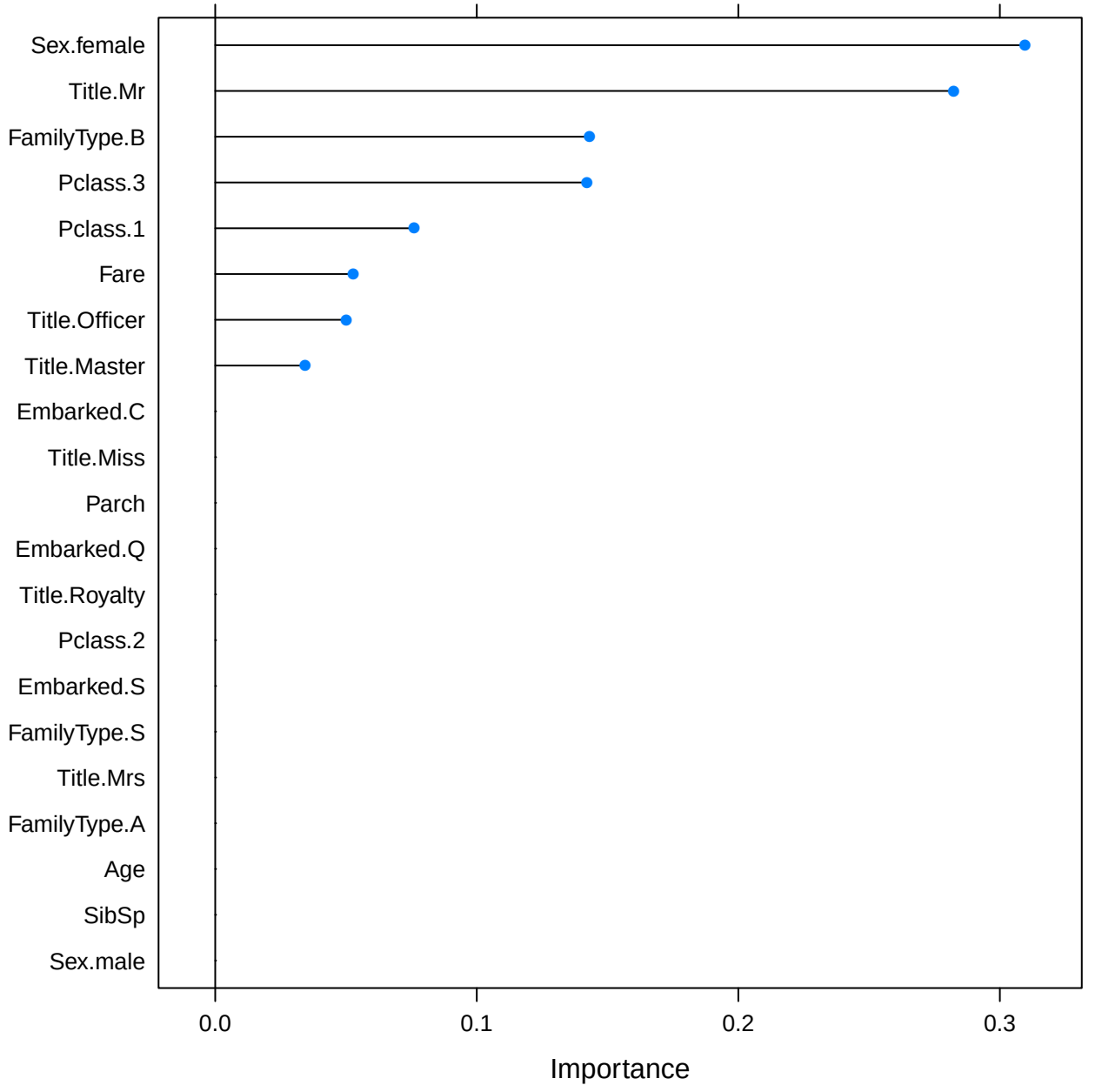

FamilyType X Survived
Count
400
200
0
A
B
FamilyType
Survived
0
1
PassengerId
Survived
Age
SibSp
Parch
Fare
Sex.female
Sex.male
Embarked.C
Embarked.Q
Embarked.S
Pclass.1
Pclass.2
Pclass.3
Title.Master
Title.Miss
Title.Mr
Title.Mrs
Title.Officer
Title.Royalty
FamilyType.A
FamilyType.B
FamilyType.S
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1

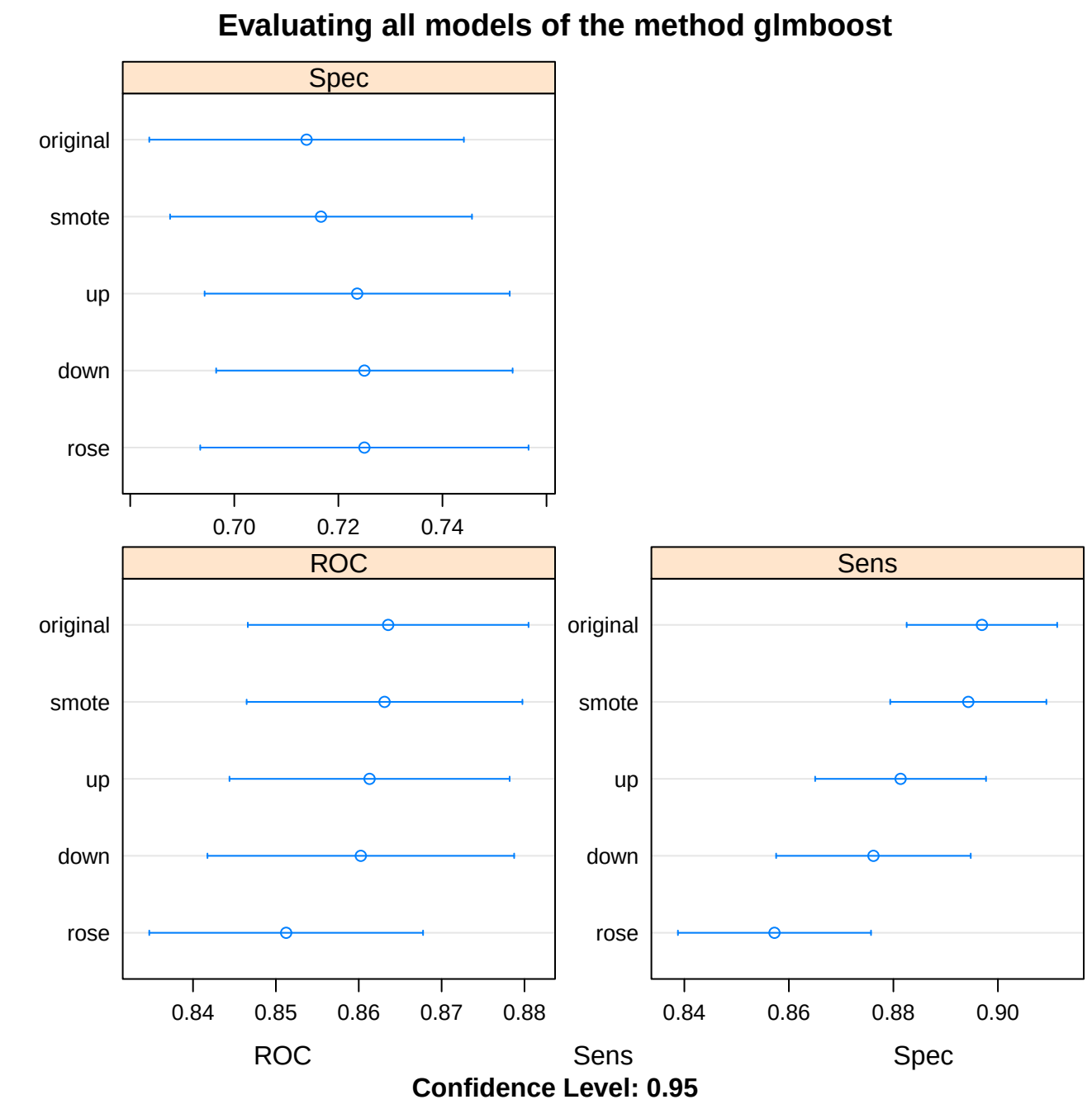

Title.Mr
Sex.female
Sex.male
Fare
Pclass.3
Title.Miss
Title.Mrs
FamilyType.S
Pclass.1
FamilyType.A
Embarked.C
Embarked.S
Parch
SibSp
Pclass.2
FamilyType.B
Age
Title.Master
Title.Officer
Title.Royalty
Embarked.Q
0.50
0.55
0.60
0.65
0.70
0.75
Importance

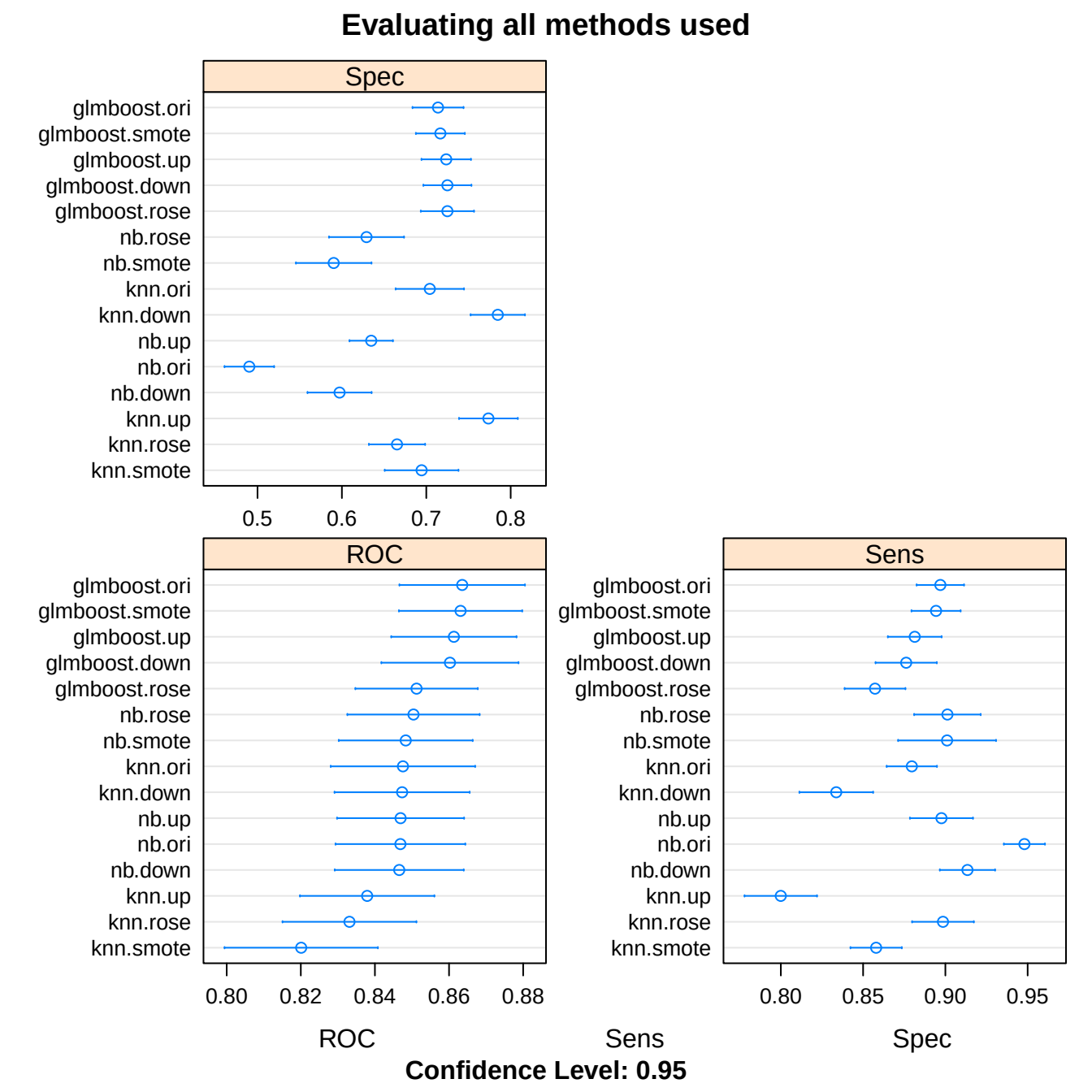

Evaluating all models of the method knn
Spec
original
down
up
rose
smote
0.65
0.70
0.75
0.80
ROC
original
down
up
rose
smote
0.80
0.82
0.84
0.86
ROC
Sens
original
down
up
rose
smote
0.80
0.85
0.90
Sens
Spec
Confidence Level: 0.95

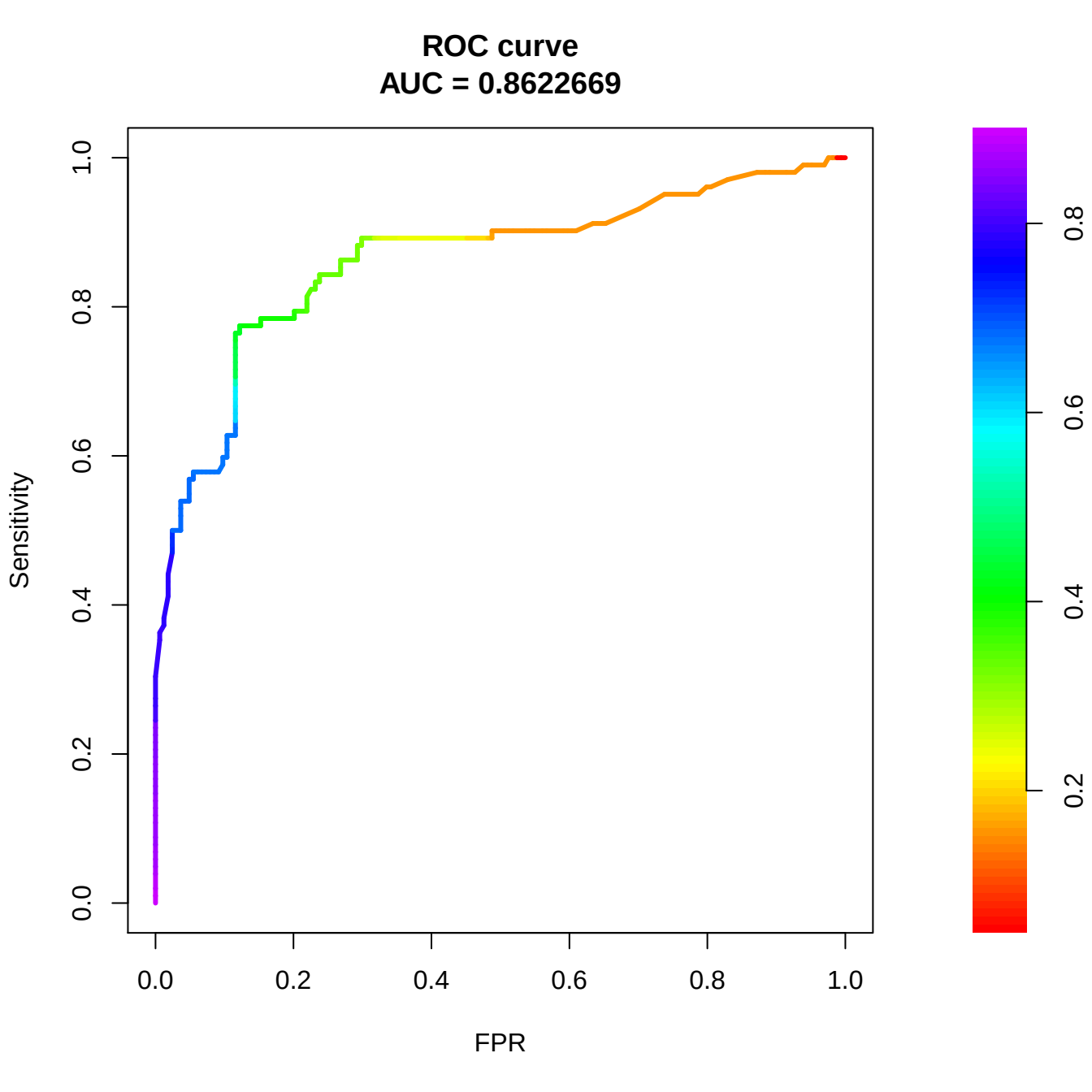

Title.Mr
Sex.female
Sex.male
Fare
Pclass.3
Title.Miss
Title.Mrs
FamilyType.S
Pclass.1
FamilyType.A
Embarked.C
Embarked.S
Parch
SibSp
Pclass.2
FamilyType.B
Age
Title.Master
Title.Officer
Title.Royalty
Embarked.Q
0.50
0.55
0.60
0.65
0.70
0.75
Importance

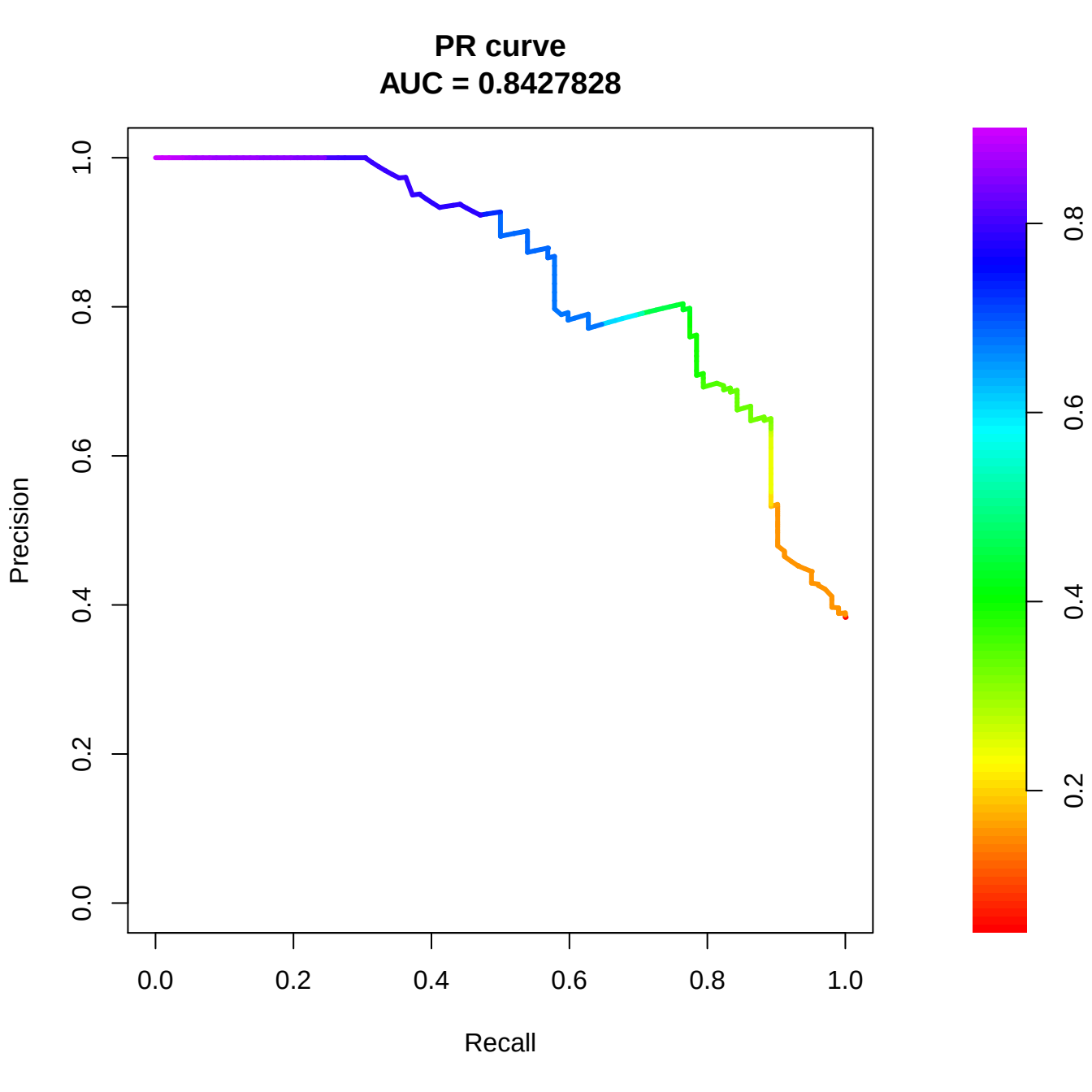

Evaluating all models of the method nb
Spec
rose
smote
up
original
down
0.50
0.55
0.60
0.65
ROC
rose
smote
up
original
down
0.83
0.84
0.85
0.86
0.87
ROC
Sens
rose
smote
up
original
down
0.88
0.90
0.92
0.94
0.96
Sens
Spec
Confidence Level: 0.95


Sex.female
Title.Mr
FamilyType.B
Pclass.3
Pclass.1
Fare
Title.Officer
Title.Master
Embarked.C
Title.Miss
Parch
Embarked.Q
Title.Royalty
Pclass.2
Embarked.S
FamilyType.S
Title.Mrs
FamilyType.A
Age
SibSp
Sex.male
0.0
0.1
0.2
0.3
Importance


Evaluating all models of the method glmboost
Spec
original
smote
up
down
rose
0.70
0.72
0.74
ROC
original
smote
up
down
rose
0.84
0.85
0.86
0.87
0.88
ROC
Sens
original
smote
up
down
rose
0.84
0.86
0.88
0.90
Sens
Spec
Confidence Level: 0.95


Evaluating all methods used
Spec
glmboost.ori
glmboost.smote
glmboost.up
glmboost.down
glmboost.rose
nb.rose
nb.smote
knn.ori
knn.down
nb.up
nb.ori
nb.down
knn.up
knn.rose
knn.smote
0.5
0.6
0.7
0.8
ROC
0.80
0.82
0.84
0.86
0.88
Sens
0.80
0.85
0.90
0.95
ROC
Sens
Spec
Confidence Level: 0.95


ROC curve
AUC = 0.8622669
Sensitivity
FPR
0.0
0.2
0.4
0.6
0.8
1.0
0.2
0.4
0.6
0.8


PR curve
AUC = 0.8427828
Precision
Recall
0.0
0.2
0.4
0.6
0.8
1.0