```
> tree_model <- rpart(Survived ~ ., data = titanic, method = "class")
> print(tree_model)
n= 714

node), split, n, loss, yval, (yprob)
      * denotes terminal node

  1) root 714 290 0 (0.59383754 0.40616246)
    2) Sex=male 453 93 0 (0.79470199 0.20529801)
      4) Age>=6.5 429 77 0 (0.82051282 0.17948718) *
      5) Age< 6.5 24   8 1 (0.33333333 0.66666667)
       10) SibSp>=2.5 9   1 0 (0.88888889 0.11111111) *
       11) SibSp< 2.5 15   0 1 (0.00000000 1.00000000) *
    3) Sex=female 261 64 1 (0.24521073 0.75478927)
      6) Pclass>=2.5 102 47 0 (0.53921569 0.46078431)
       12) Fare>=20.8 23   3 0 (0.86956522 0.13043478) *
       13) Fare< 20.8 79 35 1 (0.44303797 0.55696203)
         26) Age>=16.5 59 28 0 (0.52542373 0.47457627)
           52) Age>=36.5 7   1 0 (0.85714286 0.14285714) *
           53) Age< 36.5 52 25 1 (0.48076923 0.51923077)
            106) Parch< 0.5 39 18 0 (0.53846154 0.46153846)
              212) Fare>=7.8875 23   8 0 (0.65217391 0.34782609) *
              213) Fare< 7.8875 16   6 1 (0.37500000 0.62500000) *
            107) Parch>=0.5 13   4 1 (0.30769231 0.69230769) *
         27) Age< 16.5 20   4 1 (0.20000000 0.80000000) *
      7) Pclass< 2.5 159   9 1 (0.05660377 0.94339623) *
> prp(tree_model)
> predictions <- predict(tree_model, newdata = titanic, type = "class")
> predictions
  1   2   3   4   5   7   8   9 10 11 12 13 14 15 16 17 19 21 22 23 24 25 26 28 31 34 35 36 38 39
  0   1   0   1   0   0   0   1   1   1   1   0   0   1   1   0   0   0   1   0   0   0   0   0   0   0   0   0   0   0
 40 41 42 44 45 50 51 52 53 54 55 57 58 59 60 61 62 63 64 67 68 69 70 71 72 73 74 75 76 79
  1   0   1   1   1   0   0   0   1   1   0   1   0   1   0   1   0   0   1   0   1   0   1   0   0   0   0   0   0   1
 80 81 82 84 85 86 87 89 90 91 92 93 94 95 97 98 99 100 101 103 104 105 106 107 109 111 112 113 114 115
  0   0   0   0   1   0   0   1   0   0   1   0   0   0   0   0   0   1   0   0   0   1   0   0   1   0   1   0   0   0
116 117 118 119 120 121 123 124 125 126 128 130 131 132 133 134 135 136 137 138 139 140 142 143 144 145 146 147 148 149
  0   0   0   0   0   0   0   0   0   0   0   0   1   0   0   0   1   0   0   1   0   0   0   0   0   1   0   0   0   0
150 151 152 153 154 156 157 158 161 162 163 164 165 166 168 170 171 172 173 174 175 176 178 179 180 183 184 185 188 189
  0   0   1   0   0   0   1   0   0   0   0   0   0   1   0   0   1   0   0   0   0   1   0   0   1   0   0   1   0   0
190 191 192 193 194 195 196 198 200 201 203 204 205 206 207 208 209 210 211 212 213 214 216 217 218 219 220 221 222 223
  0   1   0   1   1   1   1   0   1   0   0   0   0   1   0   0   1   0   0   1   0   0   1   0   0   1   0   0   0   0
```
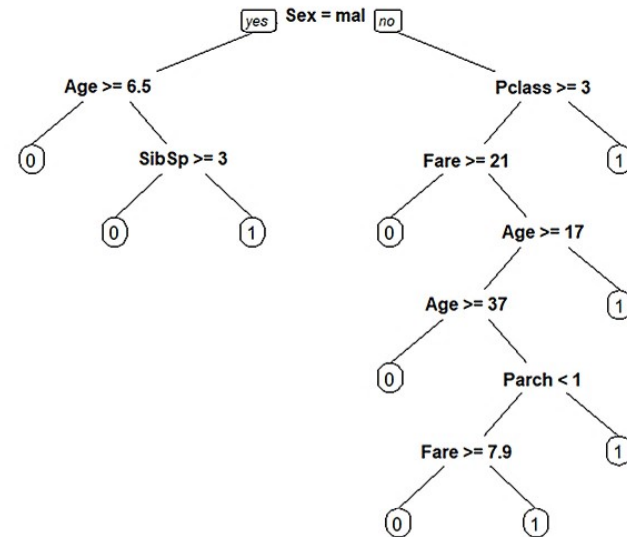


```
> titanic <- read.csv("D:\\S5\\ML\\exp7\\titanic.csv")
> head(titanic)
  PassengerId Survived Pclass                                                Name    Sex Age SibSp Parch
1           1        0      3                             Braund, Mr. Owen Harris   male  22     1     0
2           2        1      1 Cumings, Mrs. John Bradley (Florence Briggs Thayer) female  38     1     0
3           3        1      3                              Heikkinen, Miss. Laina female  26     0     0
4           4        1      1        Futrelle, Mrs. Jacques Heath (Lily May Peel) female  35     1     0
5           5        0      3                            Allen, Mr. William Henry   male  35     0     0
6           6        0      3                                    Moran, Mr. James   male  NA     0     0
            Ticket    Fare Cabin Embarked
1         A/5 21171  7.2500           S
2          PC 17599 71.2833   C85      C
3 STON/O2. 3101282  7.9250           S
4            113803 53.1000  C123      S
5            373450  8.0500           S
6            330877  8.4583           Q
> nrow(titanic)
[1] 891
> titanic <- titanic[, c("Pclass", "Sex", "Age", "SibSp", "Parch", "Fare", "Survived")]
> titanic <- na.omit(titanic)
> nrow(titanic)
[1] 714
> head(titanic)
  Pclass    Sex Age SibSp Parch    Fare Survived
1      3   male  22     1     0  7.2500        0
2      1 female  38     1     0 71.2833        1
3      3 female  26     0     0  7.9250        1
4      1 female  35     1     0 53.1000        1
5      3   male  35     0     0  8.0500        0
7      1   male  54     0     0 51.8625        0
> titanic$Sex <- as.factor(titanic$Sex)
```

```
> confusion_matrix <- table(Actual = titanic$Survived, Predicted = predictions)
> print(confusion_matrix)
      Predicted
Actual   0   1
     0 401  23
     1  90 200
```