CSCI-4047-901
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Exercise 9

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> rules2=sort(rules2,by="lift")
> inspect(rules2)
     lhs                                    rhs            support     confidence coverage    lift     count
[1]  {Class=2nd, Age=Child}              => {Survived=Yes} 0.010904134 1.0000000  0.010904134 3.095640  24
[2]  {Class=2nd, Sex=Female, Age=Child}  => {Survived=Yes} 0.005906406 1.0000000  0.005906406 3.095640  13
[3]  {Class=1st, Sex=Female}             => {Survived=Yes} 0.064061790 0.9724138  0.065879146 3.010243 141
[4]  {Class=1st, Sex=Female, Age=Adult}  => {Survived=Yes} 0.063607451 0.9722222  0.065424807 3.009650 140
[5]  {Class=2nd, Sex=Female}             => {Survived=Yes} 0.042253521 0.8773585  0.048159927 2.715986  93
[6]  {Class=Crew, Sex=Female}            => {Survived=Yes} 0.009086779 0.8695652  0.010449796 2.691861  20
[7]  {Class=Crew, Sex=Female, Age=Adult} => {Survived=Yes} 0.009086779 0.8695652  0.010449796 2.691861  20
[8]  {Class=2nd, Sex=Female, Age=Adult}  => {Survived=Yes} 0.036347115 0.8602151  0.042253521 2.662916  80
[9]  {Class=2nd, Sex=Male, Age=Adult}    => {Survived=No}  0.069968196 0.9166667  0.076328941 1.354083 154
[10] {Class=2nd, Sex=Male}               => {Survived=No}  0.069968196 0.8603352  0.081326670 1.270871 154
[11] {Class=3rd, Sex=Male, Age=Adult}    => {Survived=No}  0.175829169 0.8376623  0.209904589 1.237379 387
[12] {Class=3rd, Sex=Male}               => {Survived=No}  0.191731031 0.8274510  0.231712858 1.222295 422
```

Report -

After analyzing the Titanic passenger data from the provided file, it reveals that there are three significant factors that had the most impact on the survival chance. These are: passenger class, sex, and age.

“Passenger class” emerged as a critical factor that affected the passenger survival chances. First-class passengers, especially females, had the highest chance of survival, with a lift measure of around 3.01, indicating a strong association. Second-class female passengers also had a notably higher chance of survival compared to their male counterparts. The next factor was “Sex” as females had greater odds of survival across all classes. This is shown in adults who were females across first and second class that had a particularly higher survival chance. Finally, the last factor was age. This factor specifically played a part for children, which showed a strong positive association with the survival probability. Additionally, children who were in both the second and third class had a lift measure of about 3.10, which indicated a high chance of survival.

Finally, the lift measure provided valuable insights into the strength of association between different factors and passenger survival. It helped prioritize factors by indicating how likely survival was for passengers with certain attributes compared to the average survival rate. Measures closer to 1 indicated a weaker association or in other words showed they had a lower chance of survival. In turn the larger measures showed a stronger association or stronger chance of survival.