

Latihan Perlombongan Aturan Sekutuan / Mining Association Rule

Dapatkan deskriptif statistik

```
load("E:/Master-Data-Science/Semester_1/Data_Mining/Data/titanic.raw.rdata")
head(titanic.raw,10)
```

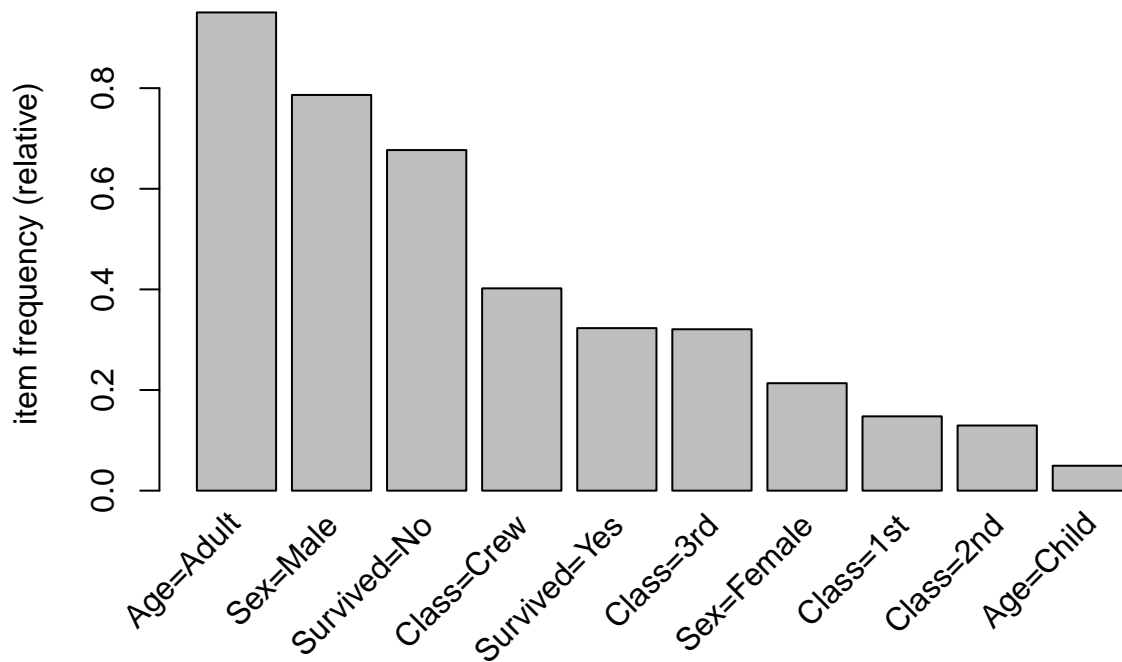
```
##      Class Sex   Age Survived
## 1     3rd Male Child        No
## 2     3rd Male Child        No
## 3     3rd Male Child        No
## 4     3rd Male Child        No
## 5     3rd Male Child        No
## 6     3rd Male Child        No
## 7     3rd Male Child        No
## 8     3rd Male Child        No
## 9     3rd Male Child        No
## 10    3rd Male Child        No
```

```
data = as(titanic.raw, 'transactions')
data
```

```
## transactions in sparse format with
## 2201 transactions (rows) and
## 10 items (columns)
```

```
itemFrequencyPlot(data, topN=10,
                  main='10 Item paling kerap terjadi')
```

10 Item paling kerap terjadi



Tentukan aturan sekutuan yang memenuhi nilai ambang minimum $\text{supp}=0.1$, $\text{conf}=0.6$.

```
head(inspect(Aturan.S1),10)
```

##	lhs	rhs	support
## [1]	{}	=> {Survived=No}	0.6769650
## [2]	{}	=> {Sex=Male}	0.7864607
## [3]	{}	=> {Age=Adult}	0.9504771
## [4]	{Class=2nd}	=> {Age=Adult}	0.1185825
## [5]	{Class=1st}	=> {Age=Adult}	0.1449341
## [6]	{Sex=Female}	=> {Survived=Yes}	0.1562926
## [7]	{Sex=Female}	=> {Age=Adult}	0.1930940
## [8]	{Class=3rd}	=> {Survived=No}	0.2398910
## [9]	{Class=3rd}	=> {Sex=Male}	0.2317129
## [10]	{Class=3rd}	=> {Age=Adult}	0.2848705
## [11]	{Survived=Yes}	=> {Age=Adult}	0.2971377
## [12]	{Class=Crew}	=> {Survived=No}	0.3057701
## [13]	{Class=Crew}	=> {Sex=Male}	0.3916402
## [14]	{Class=Crew}	=> {Age=Adult}	0.4020900
## [15]	{Survived=No}	=> {Sex=Male}	0.6197183
## [16]	{Sex=Male}	=> {Survived=No}	0.6197183

```

## [17] {Survived=No}          => {Age=Adult}      0.6533394
## [18] {Age=Adult}            => {Survived=No}    0.6533394
## [19] {Sex=Male}             => {Age=Adult}      0.7573830
## [20] {Age=Adult}            => {Sex=Male}       0.7573830
## [21] {Sex=Female, Survived=Yes} => {Age=Adult}      0.1435711
## [22] {Sex=Female, Age=Adult} => {Survived=Yes}   0.1435711
## [23] {Class=3rd, Survived=No} => {Sex=Male}       0.1917310
## [24] {Class=3rd, Sex=Male}   => {Survived=No}    0.1917310
## [25] {Class=3rd, Survived=No} => {Age=Adult}      0.2162653
## [26] {Class=3rd, Age=Adult}  => {Survived=No}    0.2162653
## [27] {Class=3rd, Sex=Male}   => {Age=Adult}      0.2099046
## [28] {Class=3rd, Age=Adult}  => {Sex=Male}       0.2099046
## [29] {Sex=Male, Survived=Yes} => {Age=Adult}      0.1535666
## [30] {Class=Crew, Survived=No} => {Sex=Male}       0.3044071
## [31] {Class=Crew, Sex=Male}   => {Survived=No}    0.3044071
## [32] {Class=Crew, Survived=No} => {Age=Adult}      0.3057701
## [33] {Class=Crew, Age=Adult} => {Survived=No}    0.3057701
## [34] {Class=Crew, Sex=Male}   => {Age=Adult}      0.3916402
## [35] {Class=Crew, Age=Adult} => {Sex=Male}       0.3916402
## [36] {Sex=Male, Survived=No} => {Age=Adult}      0.6038164
## [37] {Age=Adult, Survived=No} => {Sex=Male}       0.6038164
## [38] {Sex=Male, Age=Adult}   => {Survived=No}    0.6038164
## [39] {Class=3rd, Sex=Male, Survived=No} => {Age=Adult}      0.1758292
## [40] {Class=3rd, Age=Adult, Survived=No} => {Sex=Male}       0.1758292
## [41] {Class=3rd, Sex=Male, Age=Adult} => {Survived=No}    0.1758292
## [42] {Class=Crew, Sex=Male, Survived=No} => {Age=Adult}      0.3044071
## [43] {Class=Crew, Age=Adult, Survived=No} => {Sex=Male}       0.3044071
## [44] {Class=Crew, Sex=Male, Age=Adult} => {Survived=No}    0.3044071
##      confidence coverage lift      count
## [1] 0.6769650 1.0000000 1.0000000 1490
## [2] 0.7864607 1.0000000 1.0000000 1731
## [3] 0.9504771 1.0000000 1.0000000 2092
## [4] 0.9157895 0.1294866 0.9635051 261
## [5] 0.9815385 0.1476602 1.0326798 319
## [6] 0.7319149 0.2135393 2.2657450 344
## [7] 0.9042553 0.2135393 0.9513700 425
## [8] 0.7478754 0.3207633 1.1047474 528
## [9] 0.7223796 0.3207633 0.9185196 510
## [10] 0.8881020 0.3207633 0.9343750 627
## [11] 0.9198312 0.3230350 0.9677574 654
## [12] 0.7604520 0.4020900 1.1233254 673
## [13] 0.9740113 0.4020900 1.2384742 862
## [14] 1.0000000 0.4020900 1.0521033 885
## [15] 0.9154362 0.6769650 1.1639949 1364
## [16] 0.7879838 0.7864607 1.1639949 1364
## [17] 0.9651007 0.6769650 1.0153856 1438
## [18] 0.6873805 0.9504771 1.0153856 1438
## [19] 0.9630272 0.7864607 1.0132040 1667
## [20] 0.7968451 0.9504771 1.0132040 1667
## [21] 0.9186047 0.1562926 0.9664669 316
## [22] 0.7435294 0.1930940 2.3016993 316
## [23] 0.7992424 0.2398910 1.0162522 422
## [24] 0.8274510 0.2317129 1.2222950 422
## [25] 0.9015152 0.2398910 0.9484870 476

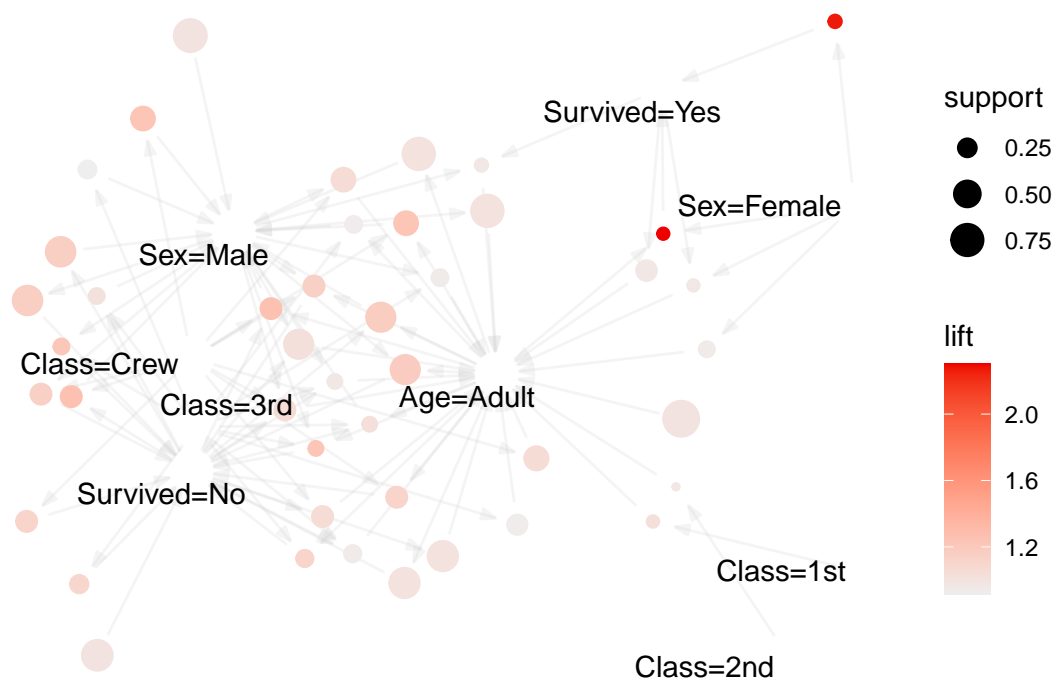
```

```
## [26] 0.7591707 0.2848705 1.1214326 476
## [27] 0.9058824 0.2317129 0.9530818 462
## [28] 0.7368421 0.2848705 0.9369090 462
## [29] 0.9209809 0.1667424 0.9689670 338
## [30] 0.9955423 0.3057701 1.2658514 670
## [31] 0.7772622 0.3916402 1.1481571 670
## [32] 1.0000000 0.3057701 1.0521033 673
## [33] 0.7604520 0.4020900 1.1233254 673
## [34] 1.0000000 0.3916402 1.0521033 862
## [35] 0.9740113 0.4020900 1.2384742 862
## [36] 0.9743402 0.6197183 1.0251065 1329
## [37] 0.9242003 0.6533394 1.1751385 1329
## [38] 0.7972406 0.7573830 1.1776688 1329
## [39] 0.9170616 0.1917310 0.9648435 387
## [40] 0.8130252 0.2162653 1.0337773 387
## [41] 0.8376623 0.2099046 1.2373791 387
## [42] 1.0000000 0.3044071 1.0521033 670
## [43] 0.9955423 0.3057701 1.2658514 670
## [44] 0.7772622 0.3916402 1.1481571 670
```

```
##           lhs           rhs  support confidence  coverage    lift
## [1]         {} => {Survived=No} 0.6769650 0.6769650 1.0000000 1.0000000
## [2]         {} => {Sex=Male} 0.7864607 0.7864607 1.0000000 1.0000000
## [3]         {} => {Age=Adult} 0.9504771 0.9504771 1.0000000 1.0000000
## [4] {Class=2nd} => {Age=Adult} 0.1185825 0.9157895 0.1294866 0.9635051
## [5] {Class=1st} => {Age=Adult} 0.1449341 0.9815385 0.1476602 1.0326798
## [6] {Sex=Female} => {Survived=Yes} 0.1562926 0.7319149 0.2135393 2.2657450
## [7] {Sex=Female} => {Age=Adult} 0.1930940 0.9042553 0.2135393 0.9513700
## [8] {Class=3rd} => {Survived=No} 0.2398910 0.7478754 0.3207633 1.1047474
## [9] {Class=3rd} => {Sex=Male} 0.2317129 0.7223796 0.3207633 0.9185196
## [10] {Class=3rd} => {Age=Adult} 0.2848705 0.8881020 0.3207633 0.9343750
##      count
## [1] 1490
## [2] 1731
## [3] 2092
## [4] 261
## [5] 319
## [6] 344
## [7] 425
## [8] 528
## [9] 510
## [10] 627
```

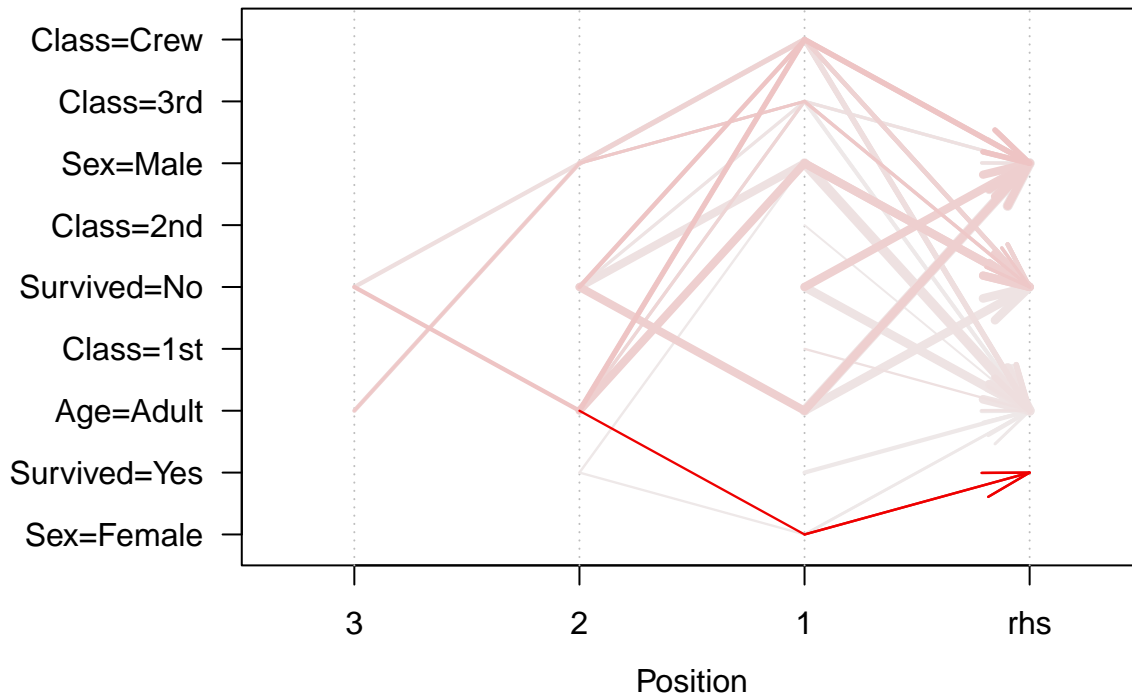
Plotkan aturan sekutuan yg diperoleh dalam ii) menggunakan plot-plot yang sesuai.

```
plot(Aturan.S1, method='graph')
```



```
plot(Aturan.S1, method='paracoord',
      control=list(reorder=T))
```

Parallel coordinates plot for 41 rules



Dapatkan aturan sekutuan yang menunjukkan ciri-ciri individu yang terselamat dari tragedi titanic (rhs: p/ubah survival).

```
inspect(Aturan.S2)
```

```
##      lhs                      rhs      support  confidence coverage
## [1] {Sex=Female}              => {Survived=Yes} 0.1562926 0.7319149 0.2135393
## [2] {Sex=Female, Age=Adult} => {Survived=Yes} 0.1435711 0.7435294 0.1930940
##      lift      count
## [1] 2.265745 344
## [2] 2.301699 316
```

Dapatkan aturan sekutuan bagi orang yang terselamat daripada kelas 1, 2 & 3 (rhs ialah “Survived=Yes” dan lhs mengandungi info Class=1st, 2nd & 3rd; Age=Child & Adult)

```
inspect(Aturan.S3)
```

```
##      lhs      rhs      support  confidence coverage  lift
## [1] {}      => {Survived=Yes} 0.3230350 0.3230350 1.0000000 1.0000000
## [2] {Age=Adult} => {Survived=Yes} 0.2971377 0.3126195 0.9504771 0.9677574
##      count
## [1] 711
## [2] 654
```