Tugas DMBI 4
FI, AR, dan SP Mining

Nama:

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1. Algoritma Apriori

a. F1 = {{1}, {2}, {3}, {5}}

   F2 = {{1,2}, {1,3}, {1,5}, {2,3}, {2,5}, {3,5}}

b. Setelah *join*:

   C3 = {{1,2,3}, {1,2,5}, {1,3,5}, {2,3,5}}

   Setelah *pruning*:

   C3 = {{1,2,3}, {1,2,5}, {1,3,5}, {2,3,5}}

c. F3 = {{1,2,5}, {2,3,5}}

d. *Frequent 3-itemset* yang dipilih = {1,2,5}

   Association rule yang dihasilkan dari *frequent 3-itemset* {1,2,5}:

   {1,2} → {5}

   {1,5} → {2}

e. *Frequent closed itemset* = {{1}, {3}, {2,5}}

   Frequent maximal itemset = {{1,3}, {1,2,5}, {2,3,5}}

2. Algoritma GSP

a. F1 = {<(1)>, <(2)>, <(3)>, <(4)>, <(5)>, <(6)>}

   F2 = {<(1)(2)>, <(1)(3)>, <(3)(2)>, <(4)(3)>)

b. Setelah *join*:

   C2 = {<(1)(3)(2)>, <(4)(3)(2)>}

Setelah *pruning*:

C2 = {<(1)(3)(2)>}

c. F3 = {<(1)(3)(2)>}

d. *Frequent closed subsequence* = {<(5)>, <(6)>, <(1)(2)>, <(1)(3)>, <(4)(3)>}

Frequent maximal subsequence = {<(5)>, <(6)>, <(4)(3)>}

3. Mushroom.arff

a. Terdapat **31** *frequent itemset* dengan algoritma **Apriori**.

```
gill-attachment='f' #SUP: 7914
gill-spacing='c' #SUP: 6812
veil-type='p' #SUP: 8124
veil-color='w' #SUP: 7924
ring-number='o' #SUP: 7488
gill-attachment='f' gill-spacing='c'  #SUP: 6602
gill-attachment='f' veil-type='p'  #SUP: 7914
gill-attachment='f' veil-color='w'  #SUP: 7906
gill-attachment='f' ring-number='o'  #SUP: 7296
gill-spacing='c' veil-type='p'  #SUP: 6812
gill-spacing='c' veil-color='w'  #SUP: 6620
gill-spacing='c' ring-number='o'  #SUP: 6464
veil-type='p' veil-color='w'  #SUP: 7924
veil-type='p' ring-number='o'  #SUP: 7488
veil-color='w' ring-number='o'  #SUP: 7288
gill-attachment='f' gill-spacing='c' veil-type='p'  #SUP: 6602
gill-attachment='f' gill-spacing='c' veil-color='w'  #SUP: 6602
gill-attachment='f' gill-spacing='c' ring-number='o'  #SUP: 6272
gill-attachment='f' veil-type='p' veil-color='w'  #SUP: 7906
gill-attachment='f' veil-type='p' ring-number='o'  #SUP: 7296
gill-attachment='f' veil-color='w' ring-number='o'  #SUP: 7288
gill-spacing='c' veil-type='p' veil-color='w'  #SUP: 6620
gill-spacing='c' veil-type='p' ring-number='o'  #SUP: 6464
gill-spacing='c' veil-color='w' ring-number='o'  #SUP: 6272
veil-type='p' veil-color='w' ring-number='o'  #SUP: 7288
gill-attachment='f' gill-spacing='c' veil-type='p' veil-color='w'  #SUP: 6602
gill-attachment='f' gill-spacing='c' veil-type='p' ring-number='o'  #SUP: 6272
gill-attachment='f' gill-spacing='c' veil-color='w' ring-number='o'  #SUP: 6272
gill-attachment='f' veil-type='p' veil-color='w' ring-number='o'  #SUP: 7288
gill-spacing='c' veil-type='p' veil-color='w' ring-number='o'  #SUP: 6272
gill-attachment='f' gill-spacing='c' veil-type='p' veil-color='w' ring-number='o'  #SUP: 6272
```

b. Terdapat **12** *frequent closed itemset* dengan algoritma **Apriori closed**.

```
veil-type='p' #SUP: 8124
gill-attachment='f' veil-type='p'  #SUP: 7914
gill-spacing='c' veil-type='p'  #SUP: 6812
veil-type='p' veil-color='w'  #SUP: 7924
veil-type='p' ring-number='o'  #SUP: 7488
gill-attachment='f' veil-type='p' veil-color='w'  #SUP: 7906
gill-attachment='f' veil-type='p' ring-number='o'  #SUP: 7296
gill-spacing='c' veil-type='p' veil-color='w'  #SUP: 6620
gill-spacing='c' veil-type='p' ring-number='o'  #SUP: 6464
gill-attachment='f' gill-spacing='c' veil-type='p' veil-color='w'  #SUP: 6602
gill-attachment='f' veil-type='p' veil-color='w' ring-number='o'  #SUP: 7288
gill-attachment='f' gill-spacing='c' veil-type='p' veil-color='w' ring-number='o'  #SUP: 6272
```

c. Terdapat **1** *frequent maximum itemset* dengan algoritma **FP max**.

```
veil-type='p' veil-color='w' gill-attachment='f' ring-number='o' gill-spacing='c' #SUP: 6272
```

d. Terdapat **78** *association rule* dengan algoritma **FPgrowth association rules**.

```
gill-attachment='f' veil-type='p' ring-number='o' ==> veil-color='w' #SUP: 7288 #CONF: 0.9989035087719298
veil-color='w' ring-number='o' ==> gill-attachment='f' veil-type='p' #SUP: 7288 #CONF: 1.0
veil-type='p' ring-number='o' ==> gill-attachment='f' veil-color='w' #SUP: 7288 #CONF: 0.9732905982905983
gill-attachment='f' ring-number='o' ==> veil-type='p' veil-color='w' #SUP: 7288 #CONF: 0.9989035087719298
ring-number='o' ==> gill-attachment='f' veil-type='p' veil-color='w' #SUP: 7288 #CONF: 0.9732905982905983
gill-spacing='c' veil-color='w' ring-number='o' ==> veil-type='p' #SUP: 6272 #CONF: 1.0
gill-spacing='c' veil-type='p' ring-number='o' ==> veil-color='w' #SUP: 6272 #CONF: 0.9702970297029703
gill-spacing='c' ring-number='o' ==> veil-type='p' veil-color='w' #SUP: 6272 #CONF: 0.9702970297029703
gill-spacing='c' veil-type='p' veil-color='w' ring-number='o' ==> gill-attachment='f' #SUP: 6272 #CONF: 1.0
gill-attachment='f' gill-spacing='c' veil-color='w' ring-number='o' ==> veil-type='p' #SUP: 6272 #CONF: 1.0
gill-attachment='f' gill-spacing='c' veil-type='p' ring-number='o' ==> veil-color='w' #SUP: 6272 #CONF: 1.0
gill-attachment='f' gill-spacing='c' veil-type='p' veil-color='w' ==> ring-number='o' #SUP: 6272 #CONF: 0.9500151469251742
gill-spacing='c' veil-color='w' ring-number='o' ==> gill-attachment='f' veil-type='p' #SUP: 6272 #CONF: 1.0
gill-spacing='c' veil-type='p' ring-number='o' ==> gill-attachment='f' veil-color='w' #SUP: 6272 #CONF: 0.9702970297029703
gill-attachment='f' gill-spacing='c' ring-number='o' ==> veil-type='p' veil-color='w' #SUP: 6272 #CONF: 1.0
gill-attachment='f' gill-spacing='c' veil-color='w' ==> veil-type='p' ring-number='o' #SUP: 6272 #CONF: 0.9500151469251742
gill-attachment='f' gill-spacing='c' veil-type='p' ==> veil-color='w' ring-number='o' #SUP: 6272 #CONF: 0.9500151469251742
gill-spacing='c' ring-number='o' ==> gill-attachment='f' veil-type='p' veil-color='w' #SUP: 6272 #CONF: 0.9702970297029703
gill-attachment='f' gill-spacing='c' ==> veil-type='p' veil-color='w' ring-number='o' #SUP: 6272 #CONF: 0.9500151469251742
```

e. Terdapat **44** *closed association rule* dengan algoritma **FPClose**.

```
veil-type='p' veil-color='w' gill-spacing='c' ==> gill-attachment='f' #SUP: 6602 #CONF: 0.9972809667673715
veil-color='w' gill-attachment='f' gill-spacing='c' ==> veil-type='p' #SUP: 6602 #CONF: 1.0
veil-type='p' gill-attachment='f' gill-spacing='c' ==> veil-color='w' #SUP: 6602 #CONF: 1.0
veil-color='w' gill-spacing='c' ==> gill-attachment='f' veil-type='p' #SUP: 6602 #CONF: 0.9972809667673715
veil-type='p' gill-spacing='c' ==> gill-attachment='f' veil-color='w' #SUP: 6602 #CONF: 0.9691720493247211
gill-attachment='f' gill-spacing='c' ==> veil-type='p' veil-color='w' #SUP: 6602 #CONF: 1.0
gill-spacing='c' ==> gill-attachment='f' veil-type='p' veil-color='w' #SUP: 6602 #CONF: 0.9691720493247211
veil-type='p' veil-color='w' ring-number='o' ==> gill-attachment='f' #SUP: 7288 #CONF: 1.0
veil-color='w' gill-attachment='f' ring-number='o' ==> veil-type='p' #SUP: 7288 #CONF: 1.0
veil-type='p' gill-attachment='f' ring-number='o' ==> veil-color='w' #SUP: 7288 #CONF: 0.9989035087719298
veil-color='w' ring-number='o' ==> gill-attachment='f' veil-type='p' #SUP: 7288 #CONF: 1.0
veil-type='p' ring-number='o' ==> gill-attachment='f' veil-color='w' #SUP: 7288 #CONF: 0.9732905982905983
gill-attachment='f' ring-number='o' ==> veil-type='p' veil-color='w' #SUP: 7288 #CONF: 0.9989035087719298
ring-number='o' ==> gill-attachment='f' veil-type='p' veil-color='w' #SUP: 7288 #CONF: 0.9732905982905983
veil-type='p' veil-color='w' ring-number='o' gill-spacing='c' ==> gill-attachment='f' #SUP: 6272 #CONF: 1.0
veil-color='w' gill-attachment='f' ring-number='o' gill-spacing='c' ==> veil-type='p' #SUP: 6272 #CONF: 1.0
veil-type='p' gill-attachment='f' ring-number='o' gill-spacing='c' ==> veil-color='w' #SUP: 6272 #CONF: 1.0
veil-type='p' veil-color='w' gill-attachment='f' gill-spacing='c' ==> ring-number='o' #SUP: 6272 #CONF: 0.9500151469251742
veil-color='w' ring-number='o' gill-spacing='c' ==> gill-attachment='f' veil-type='p' #SUP: 6272 #CONF: 1.0
veil-type='p' ring-number='o' gill-spacing='c' ==> gill-attachment='f' veil-color='w' #SUP: 6272 #CONF: 0.9702970297029703
gill-attachment='f' ring-number='o' gill-spacing='c' ==> veil-type='p' veil-color='w' #SUP: 6272 #CONF: 1.0
veil-color='w' gill-attachment='f' gill-spacing='c' ==> veil-type='p' ring-number='o' #SUP: 6272 #CONF: 0.9500151469251742
veil-type='p' gill-attachment='f' gill-spacing='c' ==> veil-color='w' ring-number='o' #SUP: 6272 #CONF: 0.9500151469251742
ring-number='o' gill-spacing='c' ==> gill-attachment='f' veil-type='p' veil-color='w' #SUP: 6272 #CONF: 0.9702970297029703
gill-attachment='f' gill-spacing='c' ==> veil-type='p' veil-color='w' ring-number='o' #SUP: 6272 #CONF: 0.9500151469251742
```

4. FIFA.txt

a. Terdapat **938** *sequential pattern* menggunakan algoritma **GSP**.

```
==============  Algorithm - STATISTICS ==============
 Total time ~ 179663 ms
 Frequent sequences count : 938
 Max memory (mb):127.28448486328125
=====================================================
```

b. Terdapat **295** *sequential pattern* di (a) yang nilai *support count*-nya >5000.

```
jumlah = 0
for i in range(len(a)):
  if (int(a[i][-1]) > 5000):
    jumlah +=1
```

```
[16] jumlah

     295
```

c. Terdapat **111** *sequential pattern* di (b) yang memuat *page* no 135.

```
jumlah135 = 0
for i in range(len(a)):
  for x in range(len(a[i][0:-2])):
    if (int(a[i][x-1]) == 135):
      jumlah135 += 1

[36] jumlah135

     111
```

d. Terdapat **277** *closed sequential pattern* dengan algoritma **BIDE+**.

```
============  BIDE+ - SPMF 0.99c - 2016 - STATISTICS =====
 Total time ~ 25819 ms
 Frequent sequences count : 277
 Max memory (mb) : 55.386260986328125
 minsup = 5113 sequences.
 Pattern count : 277
===========================================================
```

e. Terdapat **237** *maximal sequential pattern* dengan algoritma **MaxSP**.

```
=============  Algorithm MaxSP - STATISTICS =============
 Total time ~ 101965 ms
 Maximal sequential pattern count : 237
 Max memory (mb):230.69866943359375
================================================
```