

Ans7:

- a. Added in the repository.
- b. Successfully created '/Users/arth/Documents/DataMining/HW1/kosarak.arff'.
Total attributes: 41270
Total transactions: 990002
Execution time: 3.4778 seconds
- c. When I added the file on Weka, it took less than 3 seconds to execute.

Weka Explorer

Preprocess | Classify | Cluster | Associate | Select attributes | Visualize

Open/Edit/Save instances | URL... | Open DB... | Generate... | Undo | Edit... | Save...

Filter: Choose **None** [Apply] [Stop]

Current relation
Relation: /Users/arth/Documents/DataMining/HW1/... Attributes: 41270
Instances: 990002 Sum of weights: 990002

Attributes
All | None | Invert | Pattern

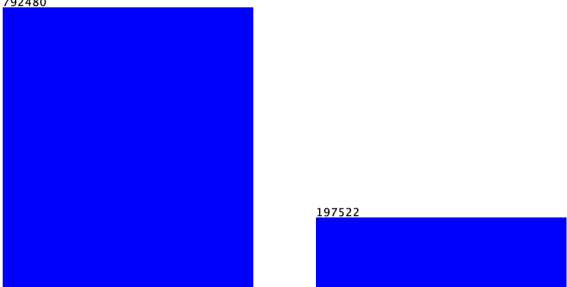
No.	Name
1	<input checked="" type="checkbox"/> i1
2	<input type="checkbox"/> i2
3	<input type="checkbox"/> i3
4	<input type="checkbox"/> i4
5	<input type="checkbox"/> i5
6	<input type="checkbox"/> i6
7	<input type="checkbox"/> i7
8	<input type="checkbox"/> i8
9	<input type="checkbox"/> i9
10	<input type="checkbox"/> i10
11	<input type="checkbox"/> i11
12	<input type="checkbox"/> i12
13	<input type="checkbox"/> i13
14	<input type="checkbox"/> i14
15	<input type="checkbox"/> i15
16	<input type="checkbox"/> i16
17	<input type="checkbox"/> i17
18	<input type="checkbox"/> i18
19	<input type="checkbox"/> i19

[Remove]

Selected attribute
Name: i1
Missing: 0 (0%) Distinct: 2 Type: Nominal Unique: 0 (0%)

No.	Label	Count	Weight
1	0	792480	792480
2	1	197522	197522

Class: i41270 (Nom) [v] [Visualize All]



Status: OK [Log] x 0

d.

The image shows two overlapping windows from the Weka software. The background window is 'Weka Explorer', which has tabs for Preprocess, Classify, Cluster, Associate, Select attributes, and Visualize. The 'Associate' tab is active, showing the 'Associator' section with a 'Choose' button and a text field containing the command: `FPGrowth -P 2 -I -1 -N 10 -T 0 -C 0.99 -D 0.05 -U 1.0 -M 0.0499999 -S`. Below this are 'Start' and 'Stop' buttons. The 'Associator output' pane shows the following text:

```
=== Run information ===
Scheme:      weka.associations.FPGrowth -P 2 -I -1 -N 10 -T 0 -C 0.99 -D 0.05 -U 1.0 -M 0.0499999 -S
Relation:    /Users/arth/Documents/DataMining/HW1/kosarak
Instances:   990002
Attributes:  41270
              [list of attributes omitted]
=== Associator model (full training set) ===

FPGrowth found 2 rules

1. [i11=1, i218=1, i148=1]: 50098 ==> [i6=1]: 49866 <conf:(1)> lift:(1.64) lev:(0.02) conv:(84.4)
2. [i11=1, i148=1]: 55759 ==> [i6=1]: 55230 <conf:(0.99)> lift:(1.63) lev:(0.02) conv:(41.3)
```

The foreground window is 'weka.gui.GenericObjectEditor' for the class 'weka.associations.FPGrowth'. It has an 'About' section with the text: 'Class implementing the FP-growth algorithm for finding large item sets without candidate generation.' and buttons for 'More' and 'Capabilities'. Below this is a list of configuration parameters:

Parameter	Value
delta	0.05
doNotCheckCapabilities	False
findAllRulesForSupportLevel	True
lowerBoundMinSupport	0.0499999
maxNumberOfItems	-1
metricType	Confidence
minMetric	0.99
numRulesToFind	10
positiveIndex	2
rulesMustContain	
transactionsMustContain	
upperBoundMinSupport	1.0
useORForMustContainList	False

At the bottom of the 'GenericObjectEditor' window are buttons for 'Open...', 'Save...', 'OK', and 'Cancel'.

e.

```
20:34:18: weka Explorer
20:34:18: (c) 1999-2022 The University of Waikato, Hamilton, New Zealand
20:34:18: web: https://www.cs.waikato.ac.nz/~ml/weka/
20:34:18: Started on Sunday, 28 September 2025
20:34:28: Base relation is now /Users/arth/Documents/DataMining/HW1/kosarak (990002 instances)
20:38:23: Base relation is now /Users/arth/Documents/DataMining/HW1/kosarak (990002 instances)
20:38:34: Started weka.associations.FilteredAssociator
20:38:34: Command: weka.associations.FilteredAssociator -F "weka.filters.MultiFilter -F \"weka.filters.unsupervised.attribute.Replace
20:38:34: weka.associations.Apriori: Cannot handle numeric attributes!
20:38:37: Started weka.associations.FilteredAssociator
20:38:37: Command: weka.associations.FilteredAssociator -F "weka.filters.MultiFilter -F \"weka.filters.unsupervised.attribute.Replace
20:38:37: weka.associations.Apriori: Cannot handle numeric attributes!
20:41:40: Base relation is now kosarak (990002 instances)
20:43:55: Base relation is now /Users/arth/Documents/DataMining/HW1/kosarak (990002 instances)
20:46:05: Base relation is now /Users/arth/Documents/DataMining/HW1/kosarak (990002 instances)
20:46:21: Started weka.associations.FPGrowth
20:46:21: Command: weka.associations.FPGrowth -P 2 -I -1 -N 10 -T 0 -C 0.9 -D 0.05 -U 1.0 -M 0.1
20:46:22: Finished weka.associations.FPGrowth
20:47:04: Started weka.associations.FPGrowth
20:47:04: Command: weka.associations.FPGrowth -P 2 -I -1 -N 10 -T 0 -C 0.1 -D 0.05 -U 1.0 -M 0.1 -S
20:47:04: Finished weka.associations.FPGrowth
20:49:00: Started weka.associations.FPGrowth
20:49:00: Command: weka.associations.FPGrowth -P 2 -I -1 -N 10 -T 0 -C 0.1 -D 0.05 -U 1.0 -M 0.05 -S
20:49:00: Finished weka.associations.FPGrowth
20:49:47: Started weka.associations.FPGrowth
20:49:47: Command: weka.associations.FPGrowth -P 2 -I -1 -N 10 -T 0 -C 2.0 -D 0.05 -U 1.0 -M 0.05 -S
20:49:47: Finished weka.associations.FPGrowth
20:50:36: Started weka.associations.FPGrowth
20:50:36: Command: weka.associations.FPGrowth -P 2 -I -1 -N 10 -T 0 -C 1.0 -D 0.05 -U 1.0 -M 0.0499999 -S
20:50:36: Finished weka.associations.FPGrowth
20:50:44: Started weka.associations.FPGrowth
20:50:44: Command: weka.associations.FPGrowth -P 2 -I -1 -N 10 -T 0 -C 0.99 -D 0.05 -U 1.0 -M 0.0499999 -S
20:50:44: Finished weka.associations.FPGrowth
```

This took less than 1 seconds for execution of each FP growth for each run.
Each run completed extremely quickly: **well under 1 second** per run.
The average runtime across 5 runs was <5 seconds.