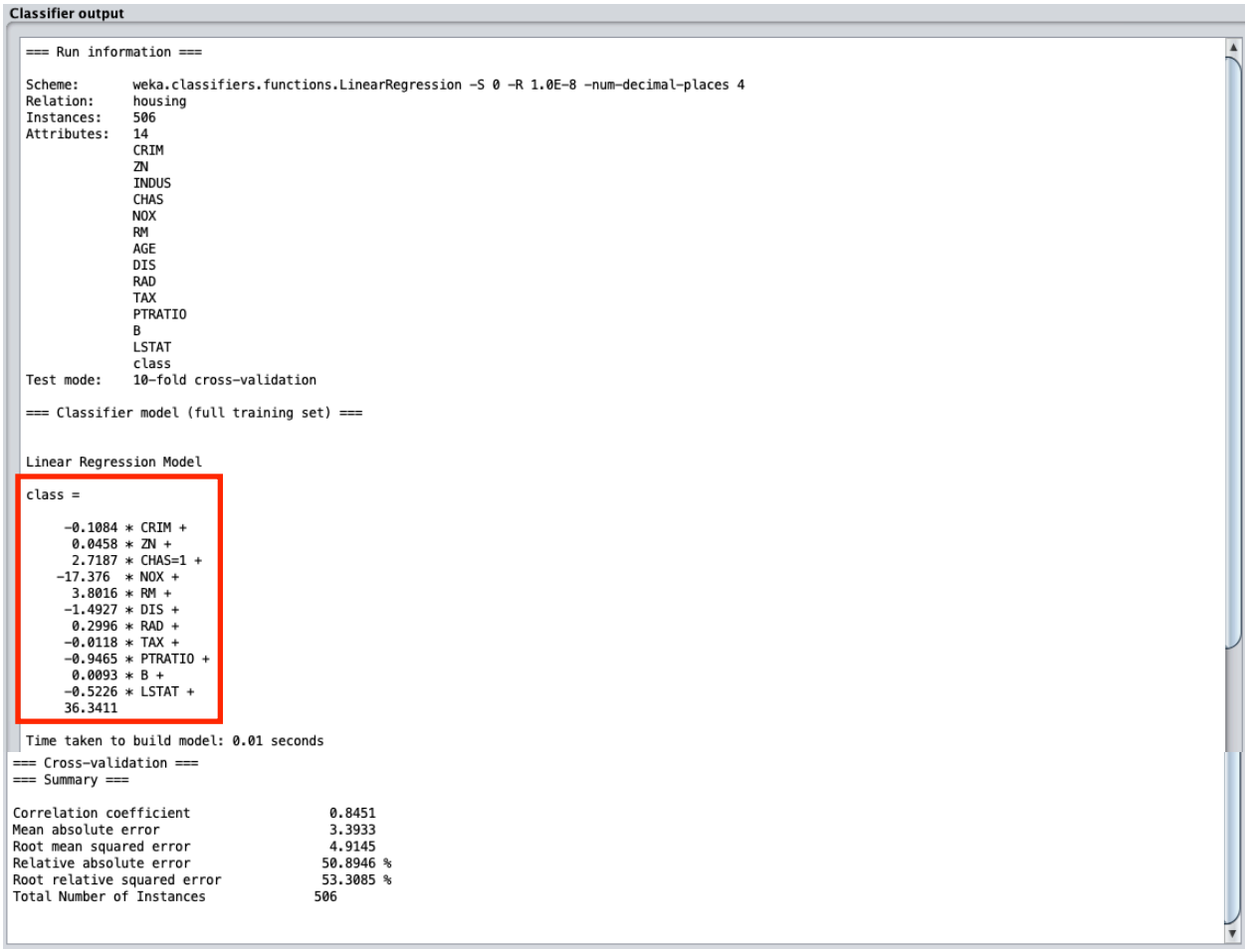
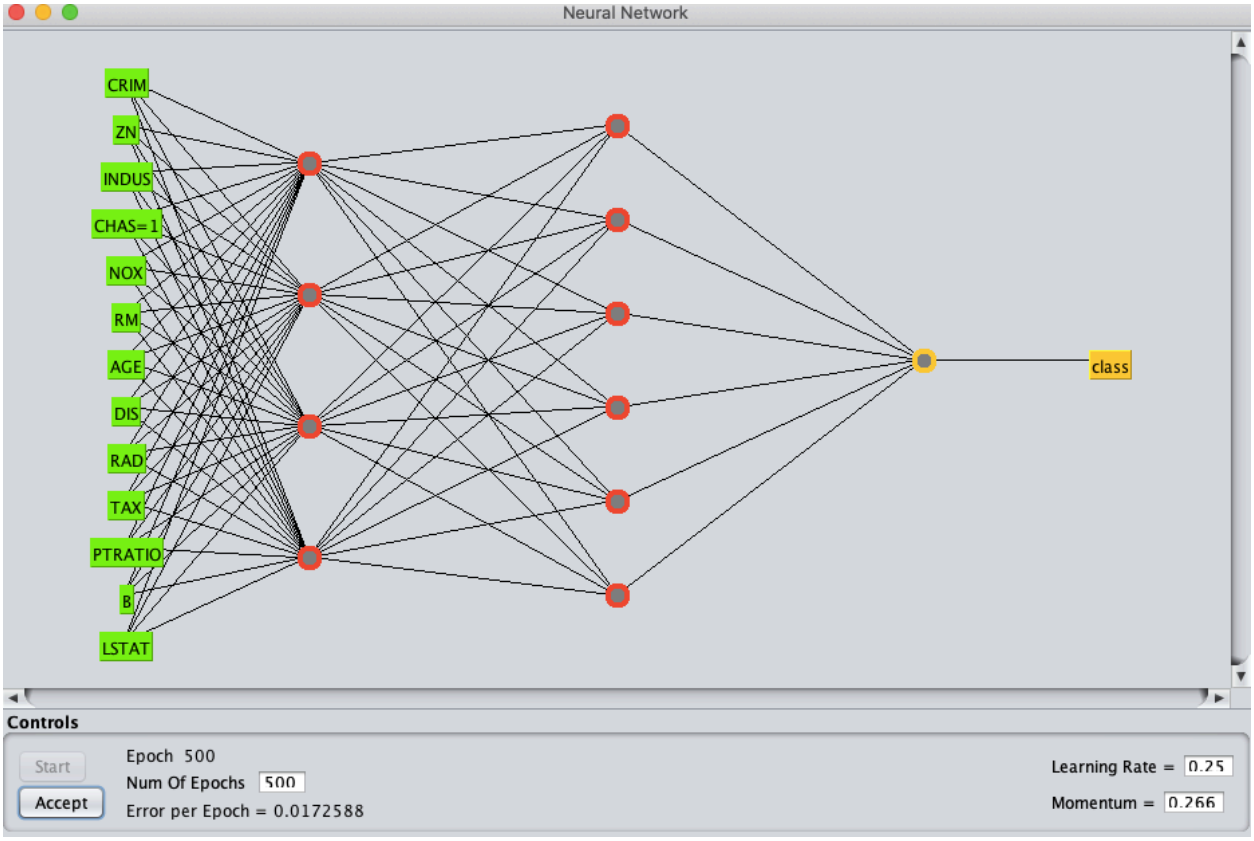
WEKA

Q1. From the below screenshot, we can observe that there are 13 attributes in the equation, and respective to each attribute, weights (or coefficients) are assigned from the trained model. Thus, whenever a testing instance (with given 13 attribute values) is provided in order to predict the **MEDV** (or Class) attribute, the following equation can be used to make a prediction.



Q2. The following **NN** with **2 hidden layers**, learning rate as 0.25 and momentum as 0.266 gives the lowest **RMSE** value of : 2.6417

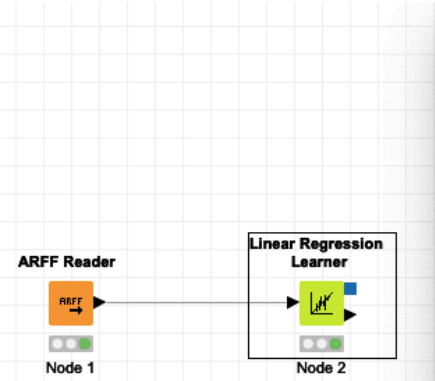



```
Time taken to build model: 15.08 seconds

=== Evaluation on training set ===

Time taken to test model on training data: 0.01 seconds

=== Summary ===

Correlation coefficient                  0.958
Mean absolute error                      1.9842
Root mean squared error                  2.6417
Relative absolute error                 29.8506 %
Root relative squared error             28.7516 %
Total Number of Instances              506
```

KNIME

Q3. Linear regression equation —

$$\begin{aligned} \textit{Num\_rings} = \; & -0.8249*\textbf{sex=I} + \\ & 0.577*\textbf{sex=M} + \\ & -0.45838*\textbf{length} + \\ & 11.0751*\textbf{diameter} + \\ & 10.7615*\textbf{height} + \\ & 8.9754*\textbf{whole\_weight} + \\ & -19.7869*\textbf{shucked\_weight} + \\ & -10.5818*\textbf{viscera\_weight} + \\ & 8.7418*\textbf{sell\_weight} + \\ & 3.9846 \end{aligned}$$



Linear Regression Result View - 2:2 - Linear Regression Learner

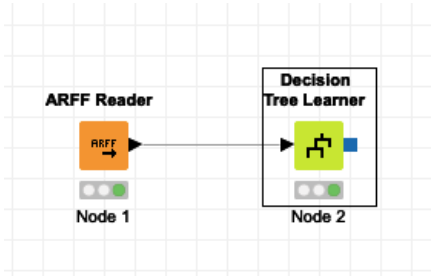
File

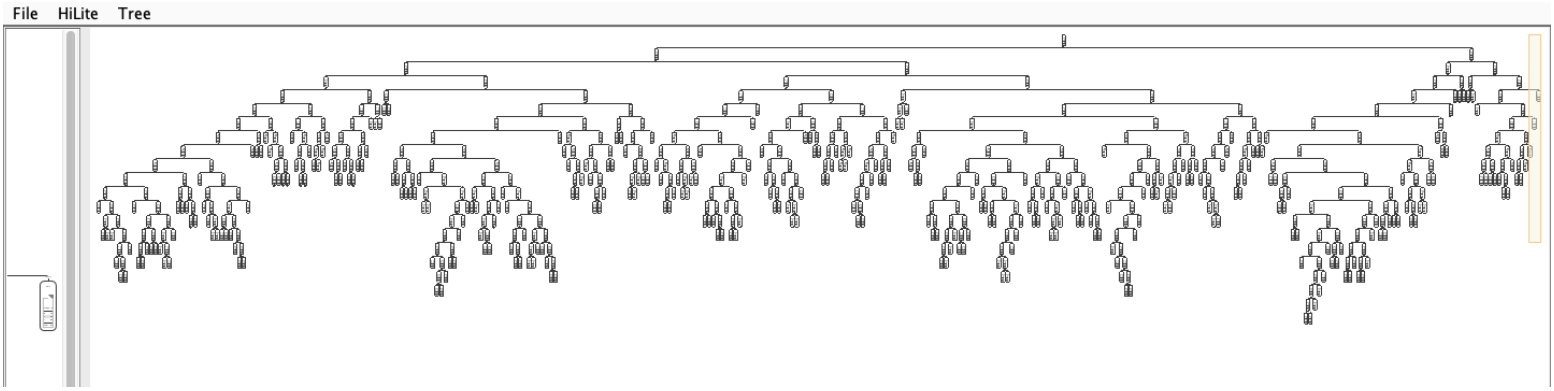
Statistics on Linear Regression

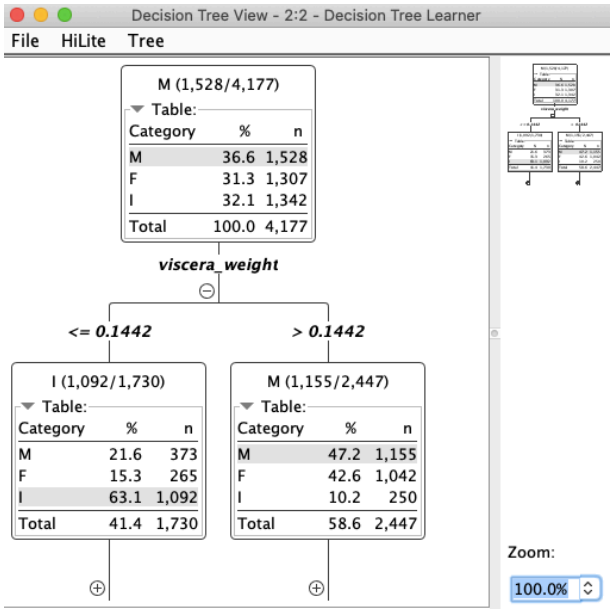
Variable	Coeff.	Std. Err.	t-value	P>|t|
sex=I	-0.8249	0.1024	-8.0558	1.11E-15
sex=M	0.0577	0.0833	0.6925	0.4887
length	-0.4583	1.8091	-0.2533	0.8
diameter	11.0751	2.2273	4.9725	6.88E-7
height	10.7615	1.5362	7.0053	2.86E-12
whole_weight	8.9754	0.7254	12.373	0.0
shucked_weight	-19.7869	0.8174	-24.2086	0.0
viscera_weight	-10.5818	1.2937	-8.1792	4.44E-16
shell_weight	8.7418	1.1247	7.7723	9.55E-15
Intercept	3.8946	0.2916	13.3576	0.0

Multiple R-Squared: 0.5379
Adjusted R-Squared: 0.5369

Q4. Decision tree learner —

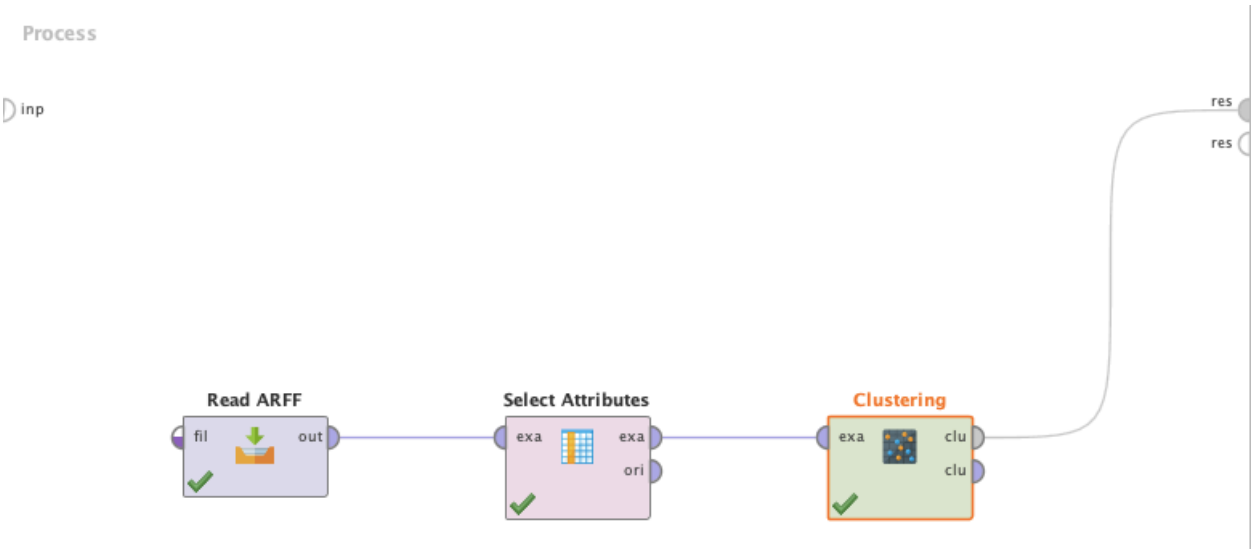






RAPID MINER STUDIO

Q5. K-means Clustering —

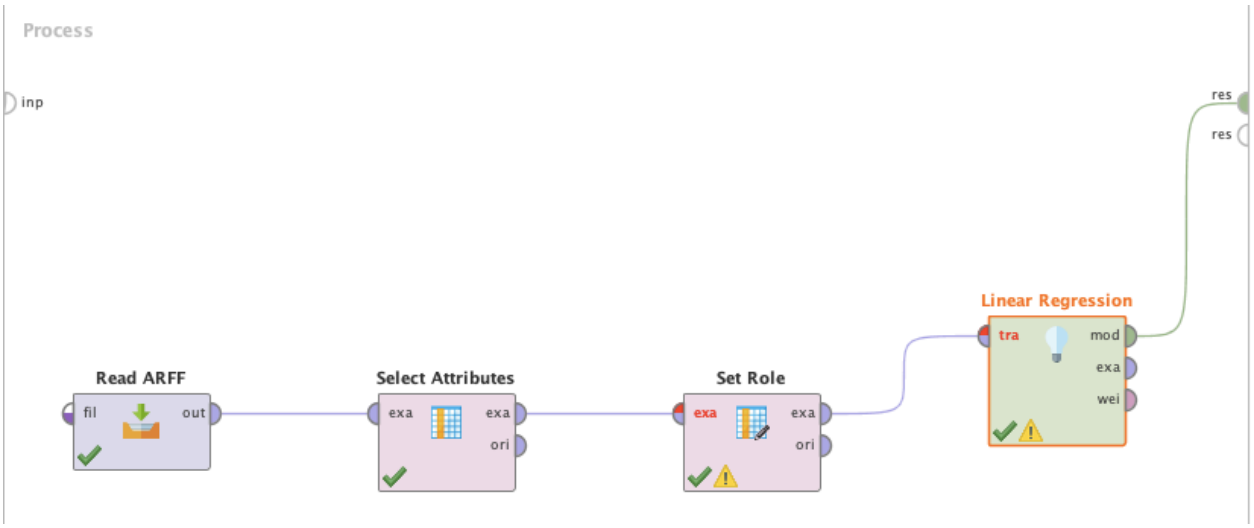


Cluster Model

```
Cluster 0: 1388 items
Cluster 1: 499 items
Cluster 2: 448 items
Cluster 3: 22 items
Cluster 4: 172 items
Cluster 5: 1648 items
Total number of items: 4177
```

Q6. Linera Regression equation —

num_rings = - 11.933 * length
+ 25.766 * diameter
+ 20.358 * height
+ 2.836



Attribute	Coefficient	Std. Error	Std. Coefficie...	Tolerance	t-Stat	p-Value	Code
length	-11.933	2.064	-0.444	0.078	-5.781	0.000	****
diameter	25.766	2.539	0.793	0.094	10.147	0	****
height	20.358	1.737	0.264	0.319	11.719	0	****
(Intercept)	2.836	0.186	?	?	15.243	0	****