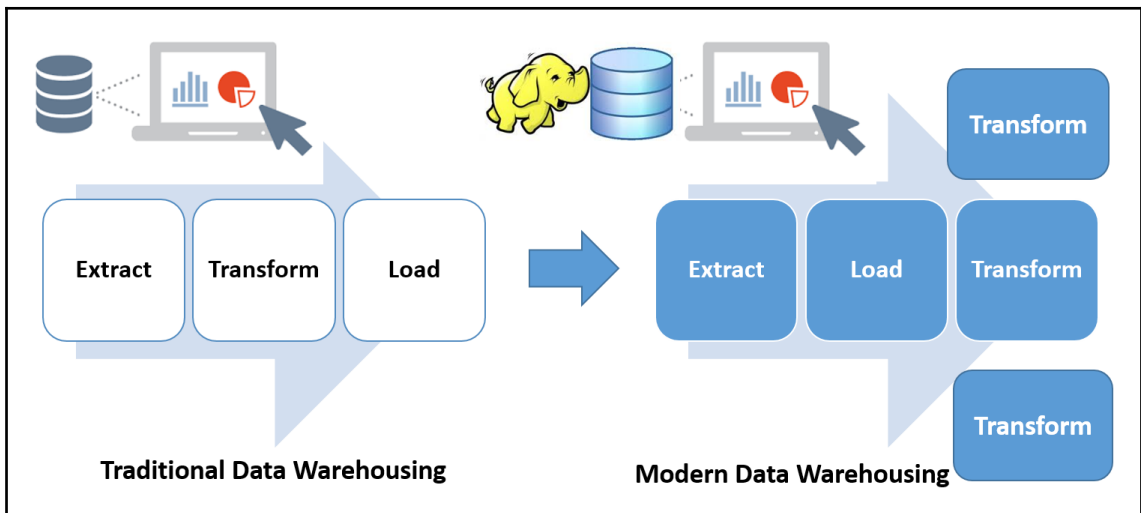
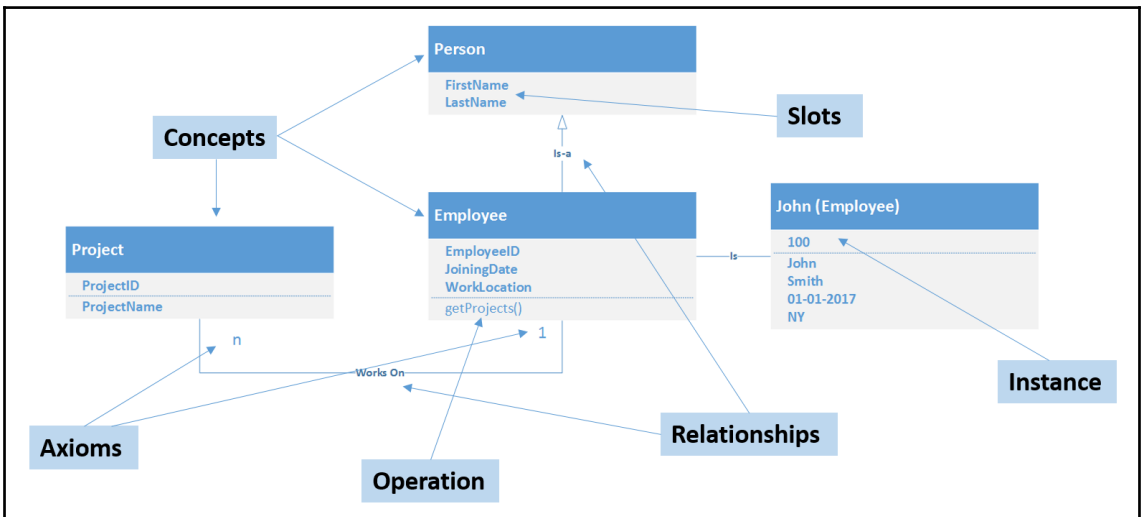
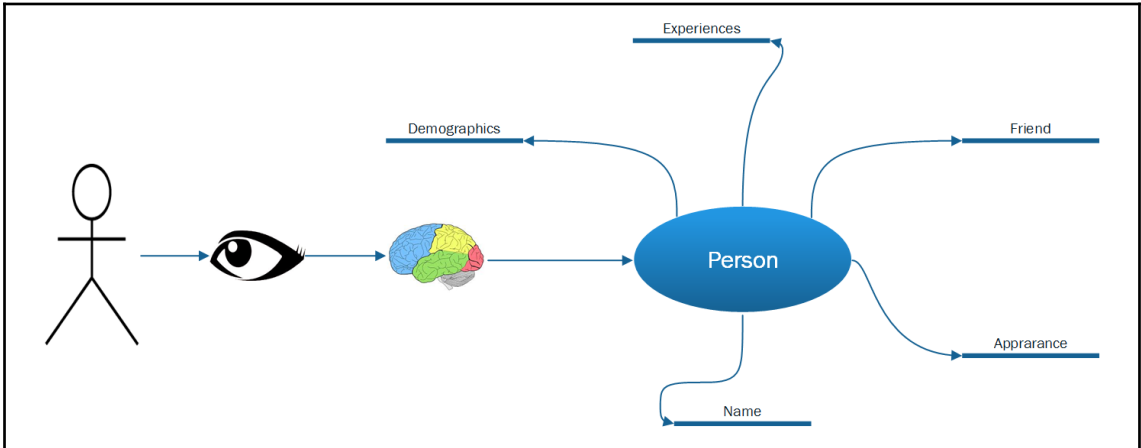


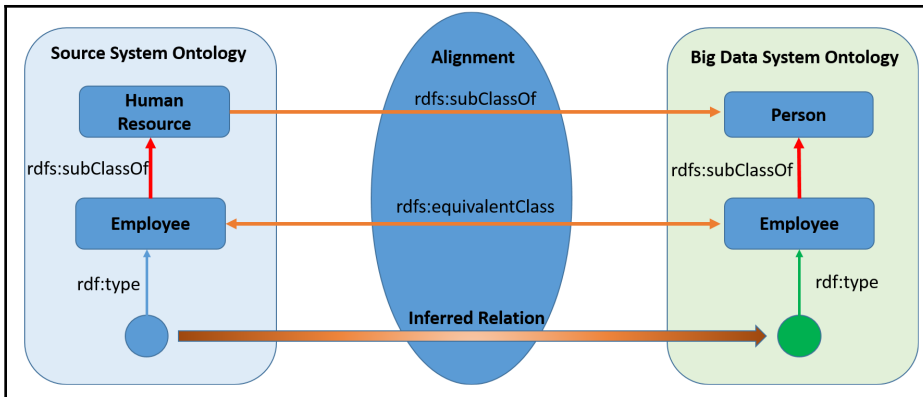
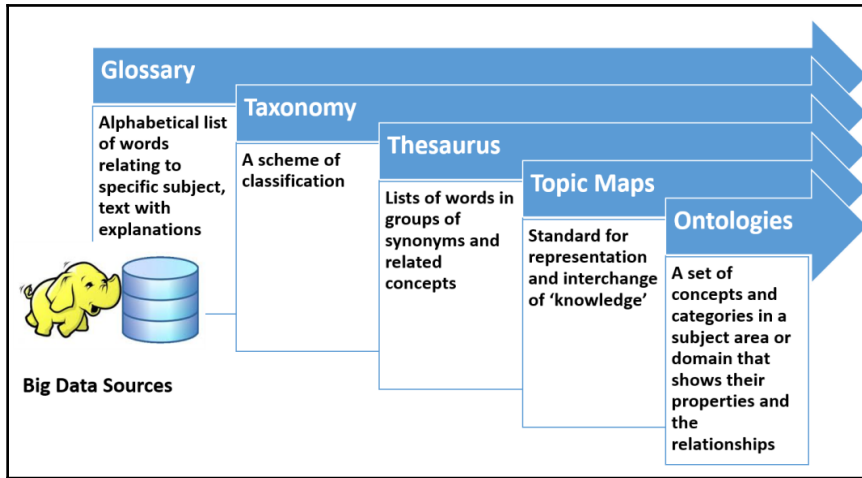
1 Graphics

Chapter 1: Big Data and Artificial Intelligence Systems

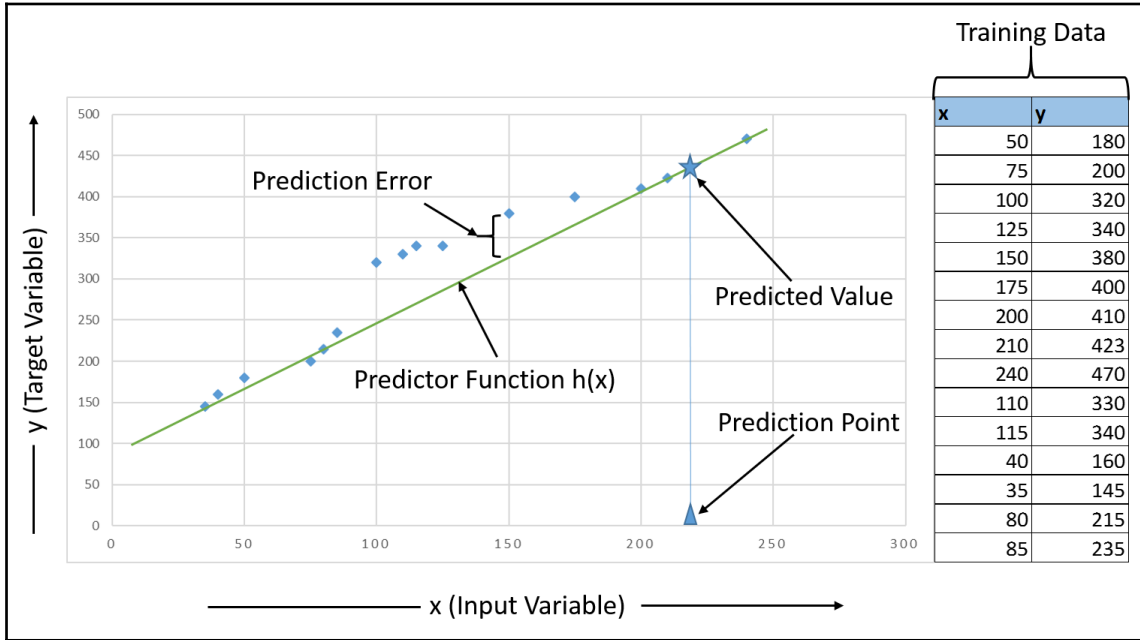


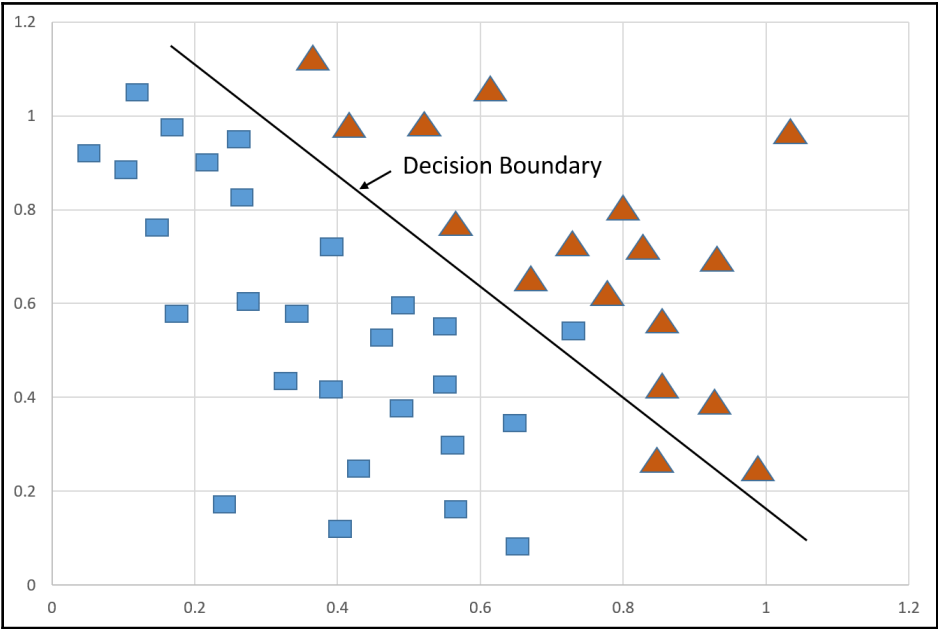
Chapter 2: Ontology for Big Data

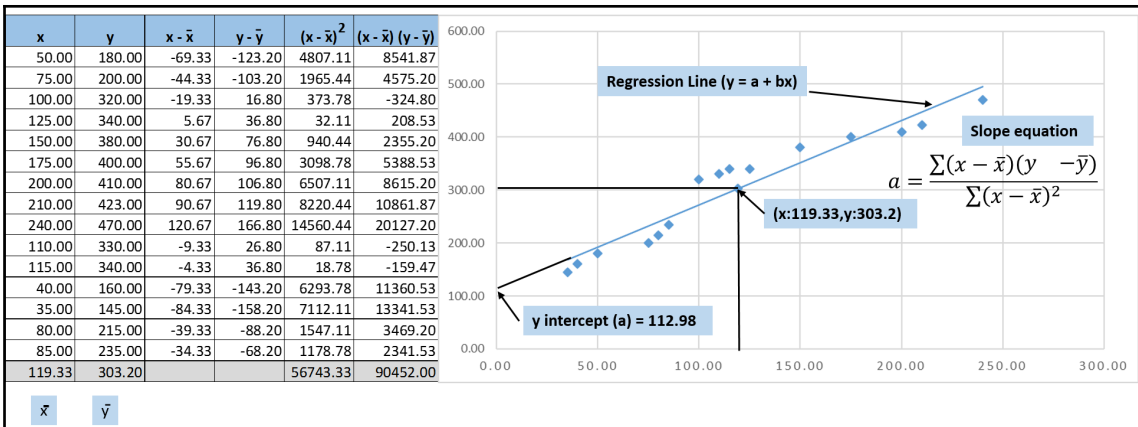
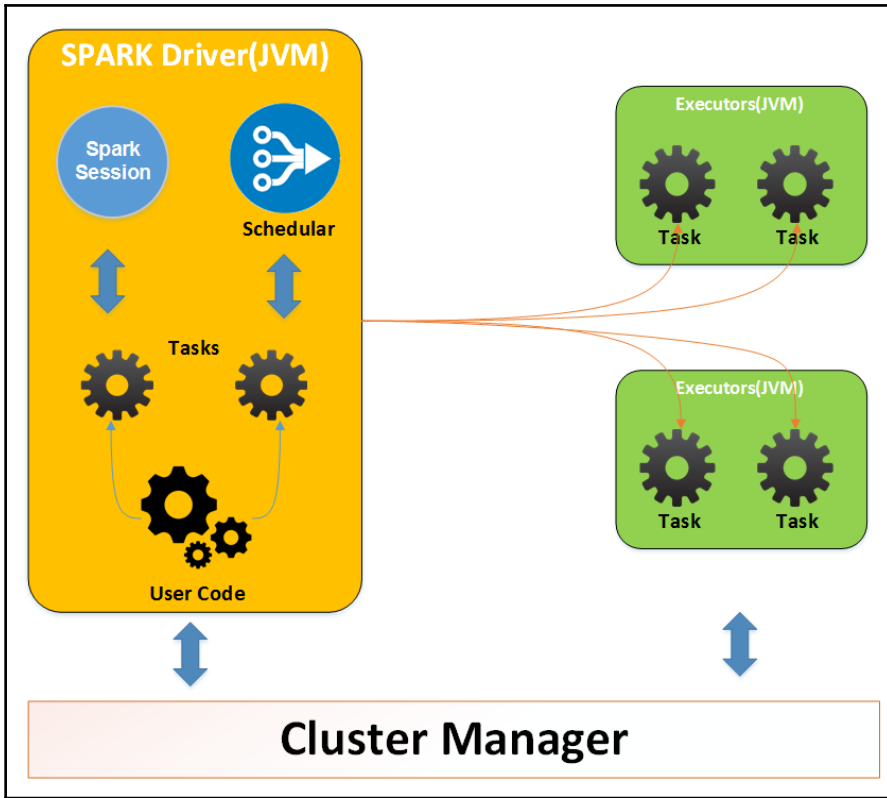


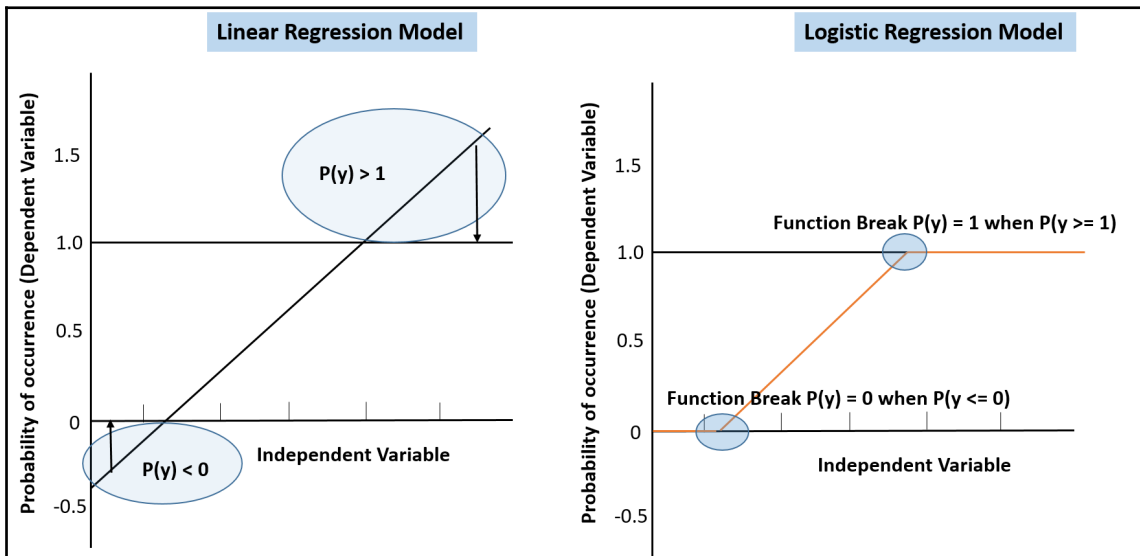
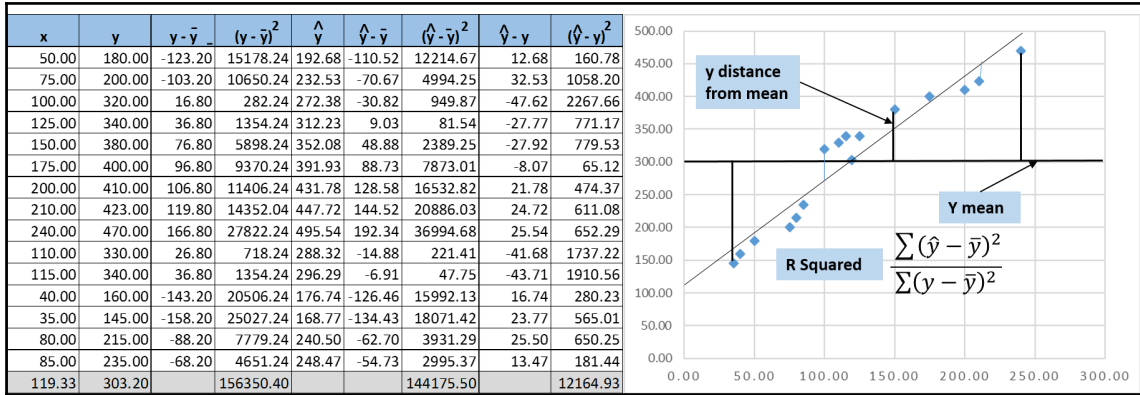


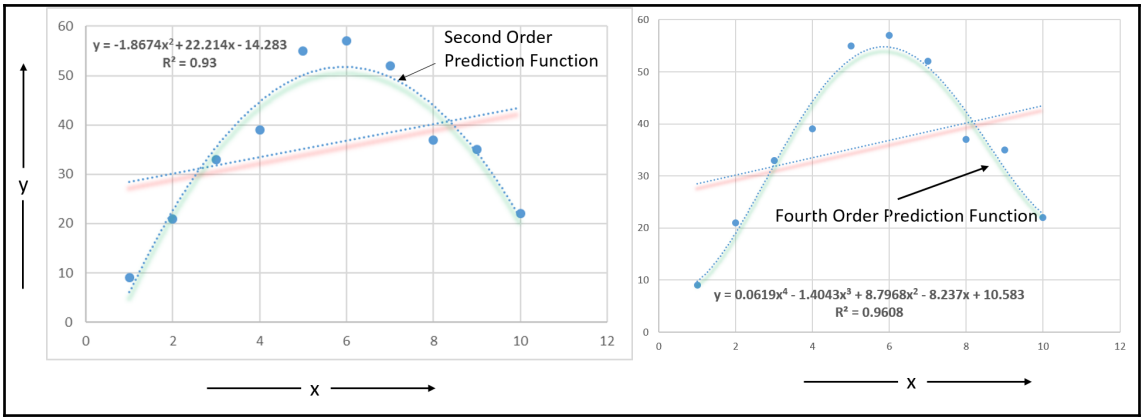
Chapter 3: Learning from Big Data







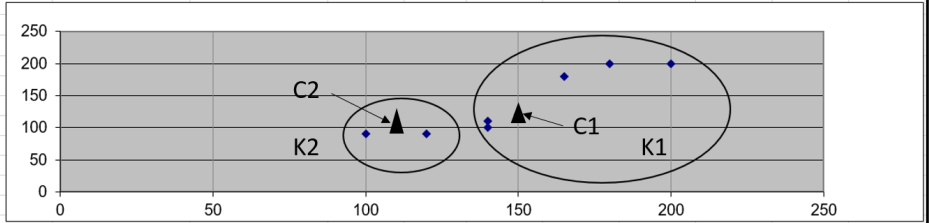


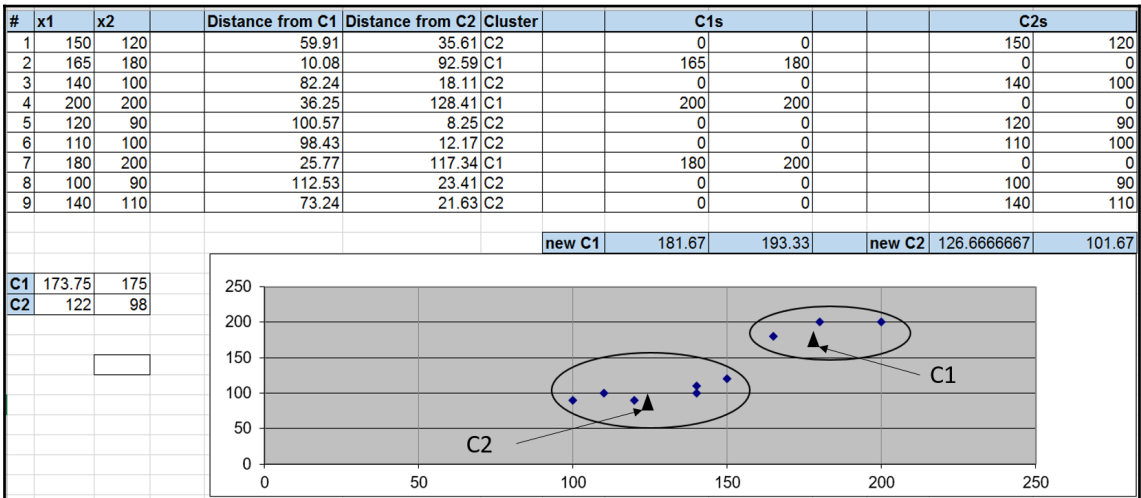
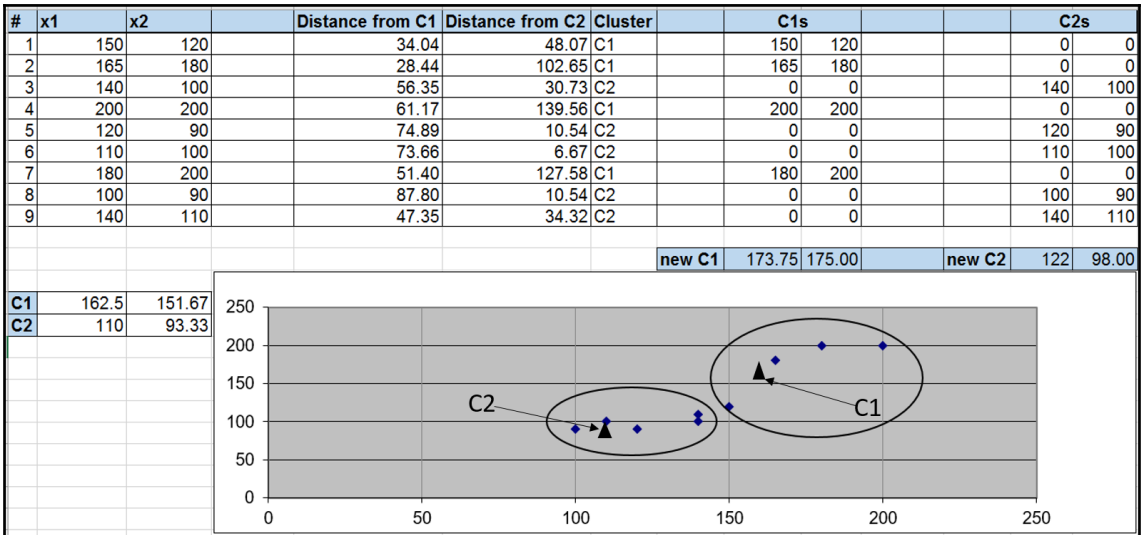


#	x1	x2		Distance from C1	Distance from C2	Cluster	C1s		C2s	
1	150	120	C1	0.00	44.72	C1	150	120	0	0
2	165	180		61.85	97.08	C1	165	180	0	0
3	140	100		22.36	30.00	C1	140	100	0	0
4	200	200		94.34	134.54	C1	200	200	0	0
5	120	90		42.43	14.14	C2	0	0	120	90
6	110	100	C2	44.72	0.00	C2	0	0	110	100
7	180	200		85.44	122.07	C1	180	200	0	0
8	100	90		58.31	14.14	C2	0	0	100	90
9	140	110		14.14	31.62	C1	140	110	0	0

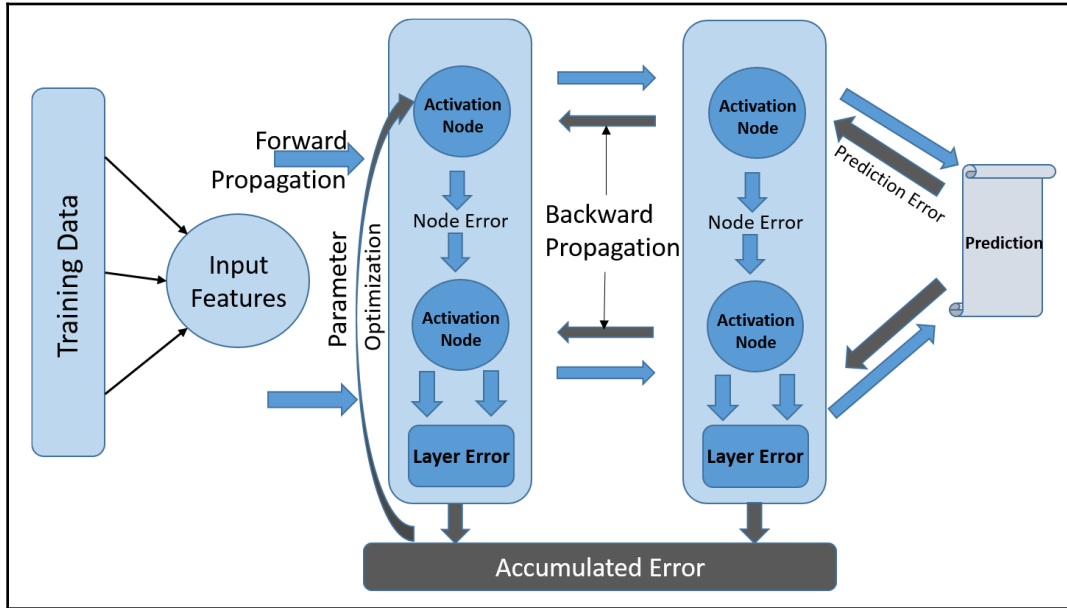
new C1 162.50 151.67 new C2 110 93.33

C1	150	120
C2	110	100

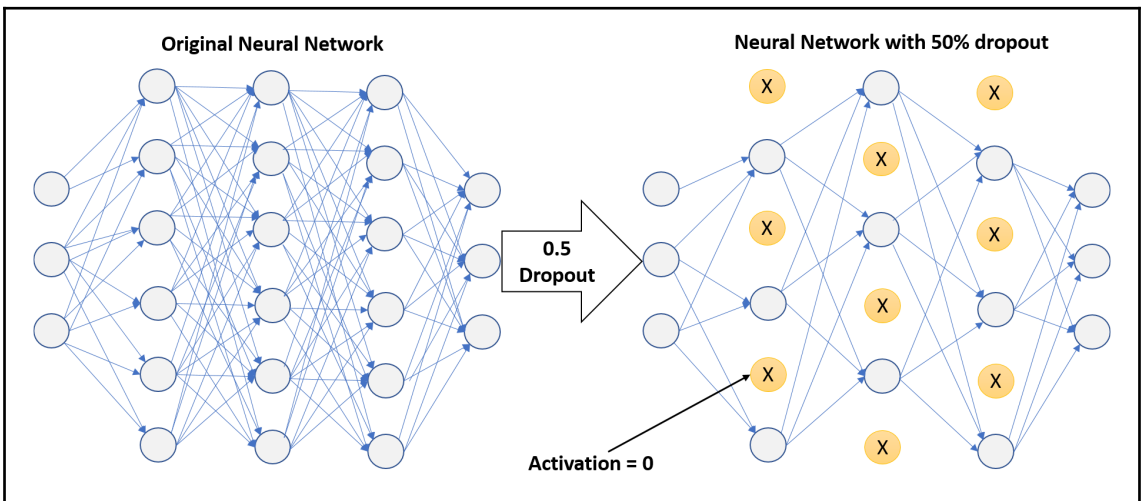
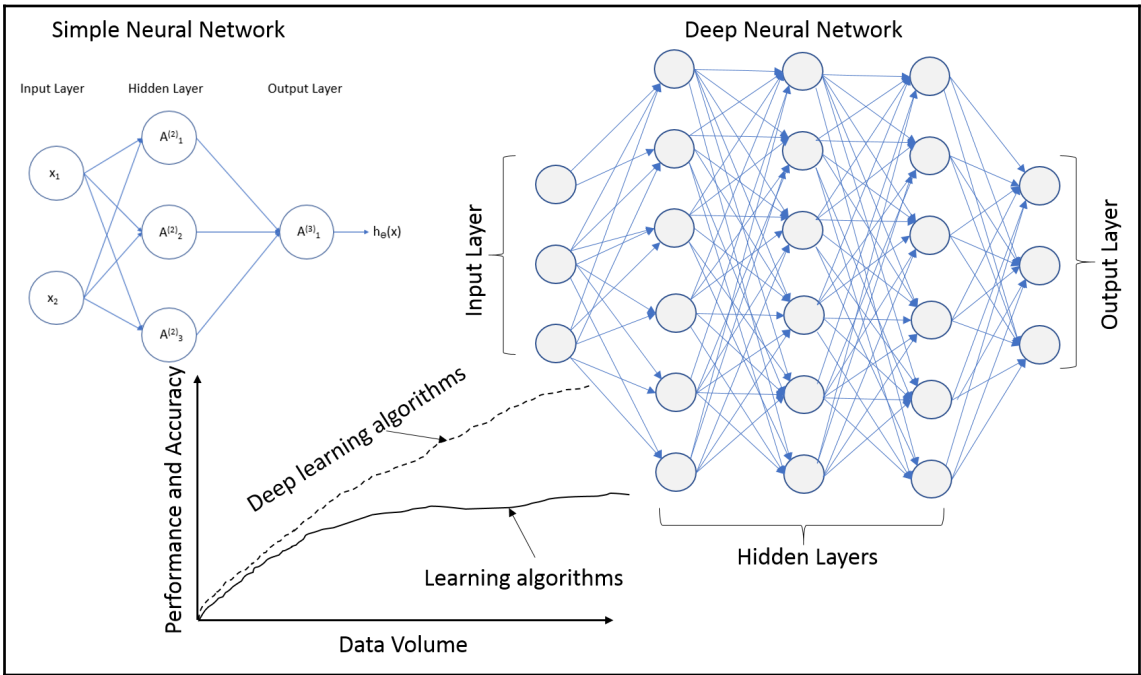


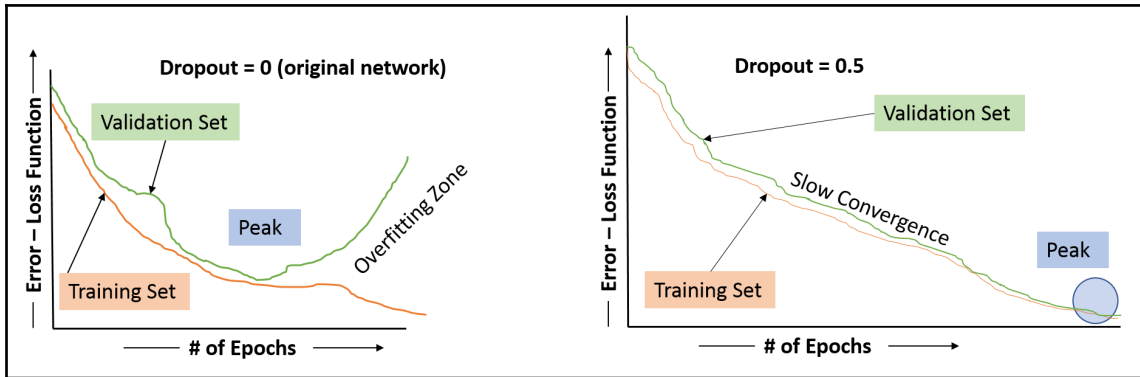


Chapter 4: Neural Network for Big Data

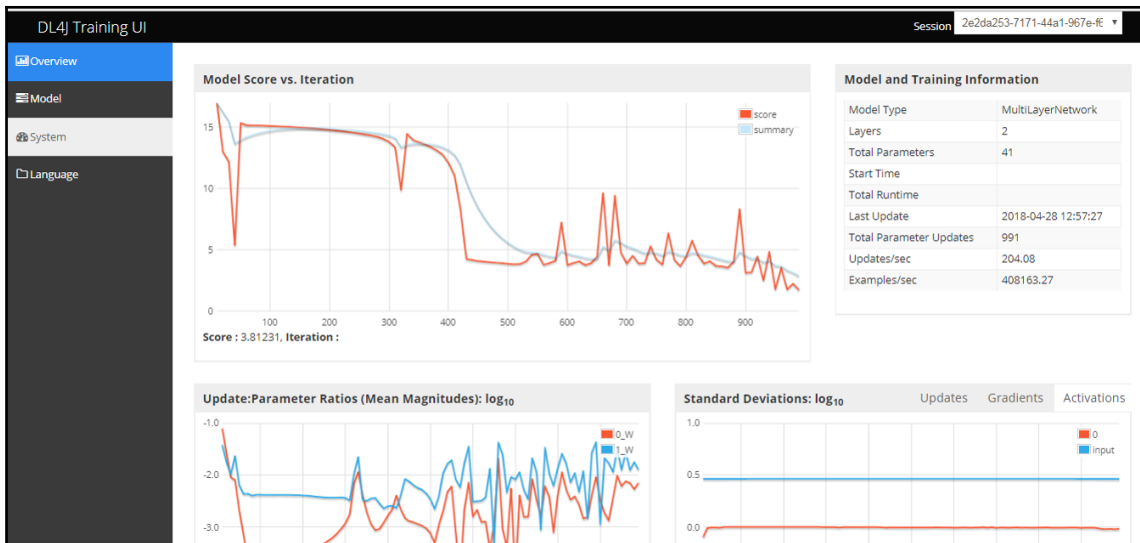


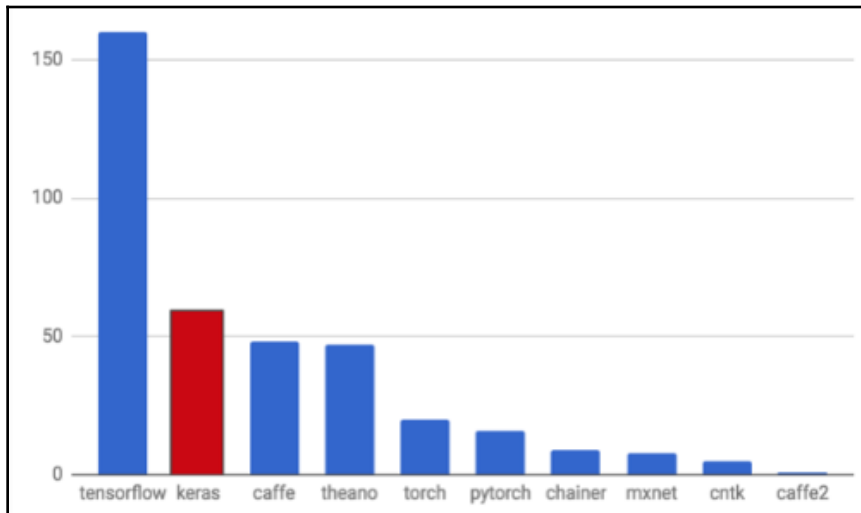
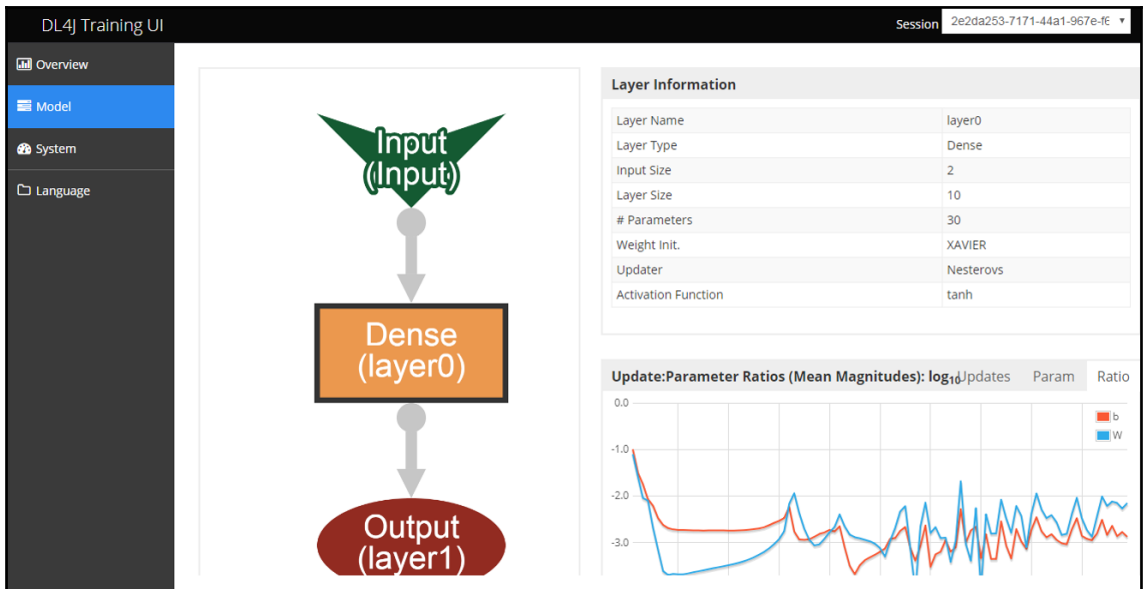
Chapter 5: Deep Big Data Analytics





Data Type	Description
CSV	Comma separated files. The data fields (attributes are separated by COMMA ',' character)
Raw Test Data	Tweets, Text Documents and so on
Image Data	The images are stored as the two dimensional array of pixels. The pixels are represented as an integer value in various color scales. For example, the grey scale image contains 256 unique sheds represented by numbers between 0 and 255
LibSVM Data	LibSVM is an open machine library which specifies the data representation in a structured schema
Matlab (MAT) format	This is a binary file format which is internally used by MatLab. It includes arrays, variables, functions
JSON, XML, YAML	These are text formats which are defined by semantic rules and support hierarchical representation of the data



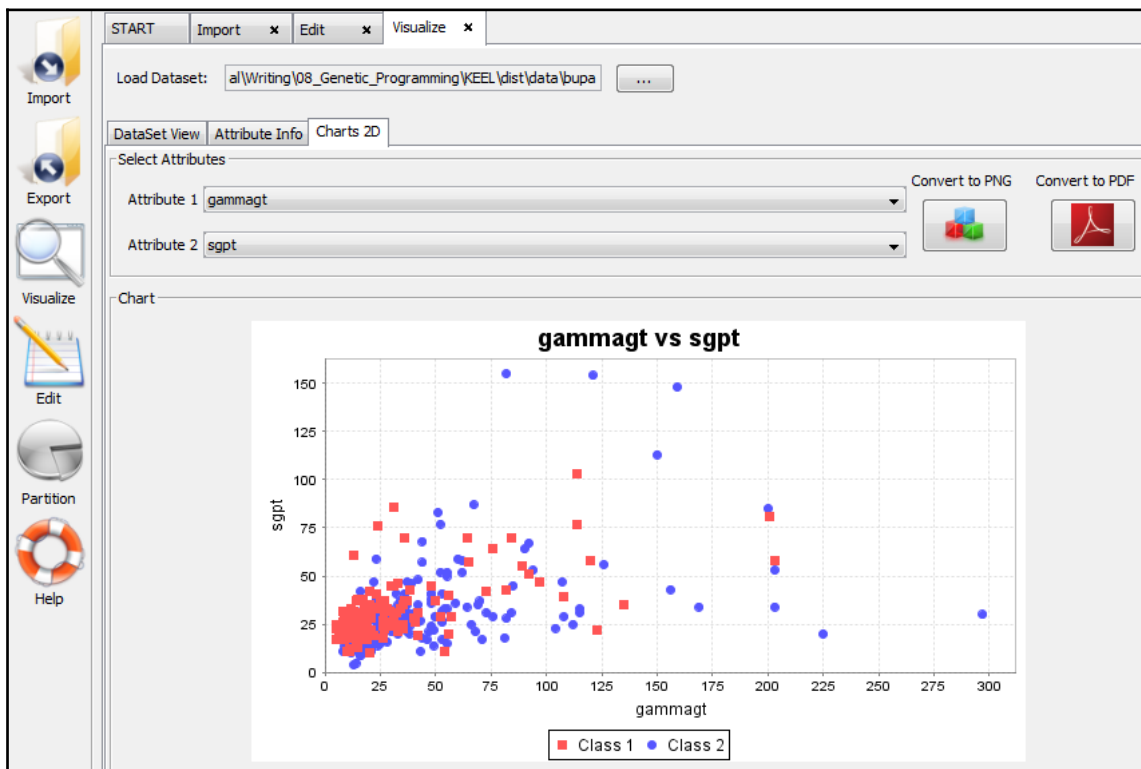


Chapter 7: Fuzzy Systems

```
Point [200.0]
Probability to belong to cluster 0 is 0.000219
Probability to belong to cluster 1 is 0.999781
Point [204.0]
Probability to belong to cluster 0 is 0.006037
Probability to belong to cluster 1 is 0.993963
Point [5.0]
Probability to belong to cluster 0 is 0.998991
Probability to belong to cluster 1 is 0.001009
Point [198.0]
Probability to belong to cluster 0 is 0.001727
Probability to belong to cluster 1 is 0.998273
Point [198.0]
Probability to belong to cluster 0 is 0.001727
Probability to belong to cluster 1 is 0.998273
Point [4.0]
Probability to belong to cluster 0 is 0.999958
Probability to belong to cluster 1 is 0.000042
Point [4.0]
Probability to belong to cluster 0 is 0.999958
Probability to belong to cluster 1 is 0.000042
Point [203.0]
Probability to belong to cluster 0 is 0.004299
Probability to belong to cluster 1 is 0.995701
Point [2.0]
Probability to belong to cluster 0 is 0.997964
Probability to belong to cluster 1 is 0.002036
Point [195.0]
Probability to belong to cluster 0 is 0.006995
Probability to belong to cluster 1 is 0.993005
Point [3.0]
Probability to belong to cluster 0 is 0.999244
Probability to belong to cluster 1 is 0.000756
Point [201.0]
Probability to belong to cluster 0 is 0.001303
Probability to belong to cluster 1 is 0.998697
```

```
Point [200.0]
Probability to belong to cluster 0 is 0.497199
Probability to belong to cluster 1 is 0.502801
Point [204.0]
Probability to belong to cluster 0 is 0.497317
Probability to belong to cluster 1 is 0.502683
Point [5.0]
Probability to belong to cluster 0 is 0.502447
Probability to belong to cluster 1 is 0.497553
Point [198.0]
Probability to belong to cluster 0 is 0.497136
Probability to belong to cluster 1 is 0.502864
Point [198.0]
Probability to belong to cluster 0 is 0.497136
Probability to belong to cluster 1 is 0.502864
Point [4.0]
Probability to belong to cluster 0 is 0.502424
Probability to belong to cluster 1 is 0.497576
Point [4.0]
Probability to belong to cluster 0 is 0.502424
Probability to belong to cluster 1 is 0.497576
Point [203.0]
Probability to belong to cluster 0 is 0.497288
Probability to belong to cluster 1 is 0.502712
Point [2.0]
Probability to belong to cluster 0 is 0.502379
Probability to belong to cluster 1 is 0.497621
Point [195.0]
Probability to belong to cluster 0 is 0.497036
Probability to belong to cluster 1 is 0.502964
Point [3.0]
Probability to belong to cluster 0 is 0.502401
Probability to belong to cluster 1 is 0.497599
Point [201.0]
Probability to belong to cluster 0 is 0.497229
Probability to belong to cluster 1 is 0.502771
```

Chapter 8: Genetic Programming



Type of partitions

k-fold cross validation

k-fold DOB-SCV

5x2 cross validation

without validation

Type of the experiment

The screenshot shows the 'Experiments Design: Off-Line Module' interface. On the left, a workflow diagram starts with a 'data' node, which branches into two paths: one leading to a 'GGA-Binary-Inconsistency' node and another to a 'GGA-F5' node. Both nodes are represented by icons of a cube with a green arrow. The 'Algorithm Parameters' dialog box is open on the right, displaying the following settings:

Algorithm Name: Generational Genetic Algorithm for Feature Selection

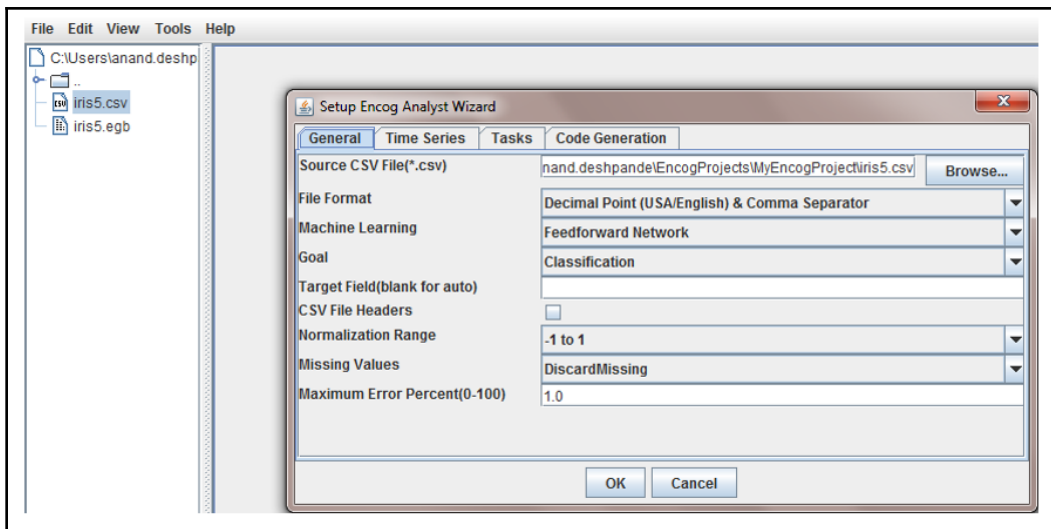
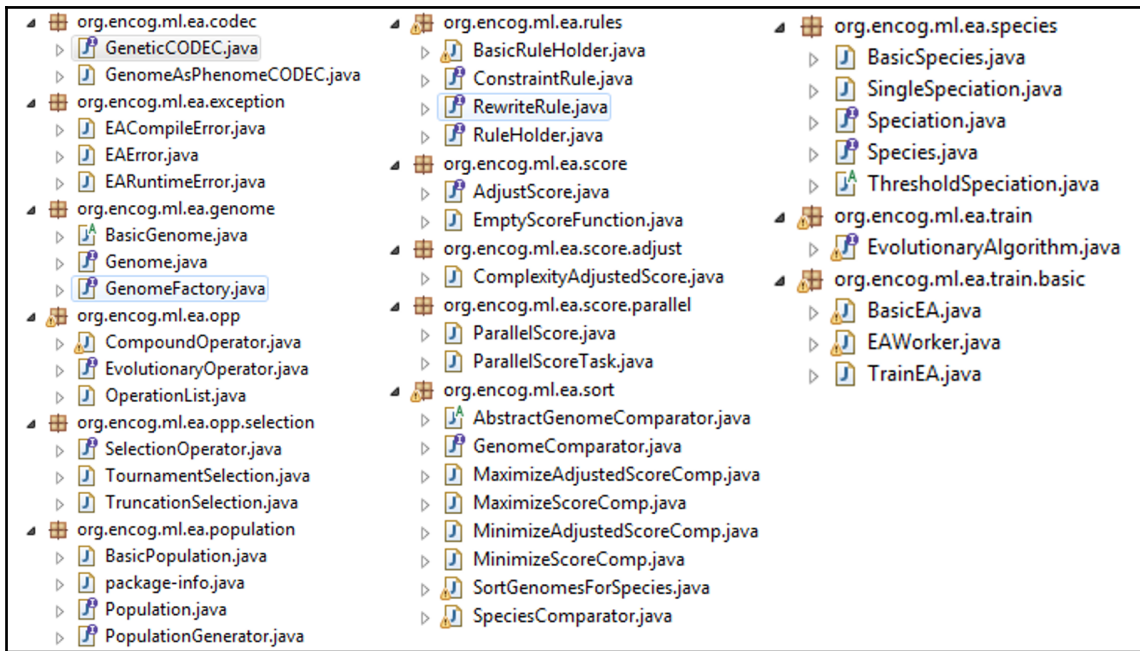
Number of Executions: [Input field with '1']

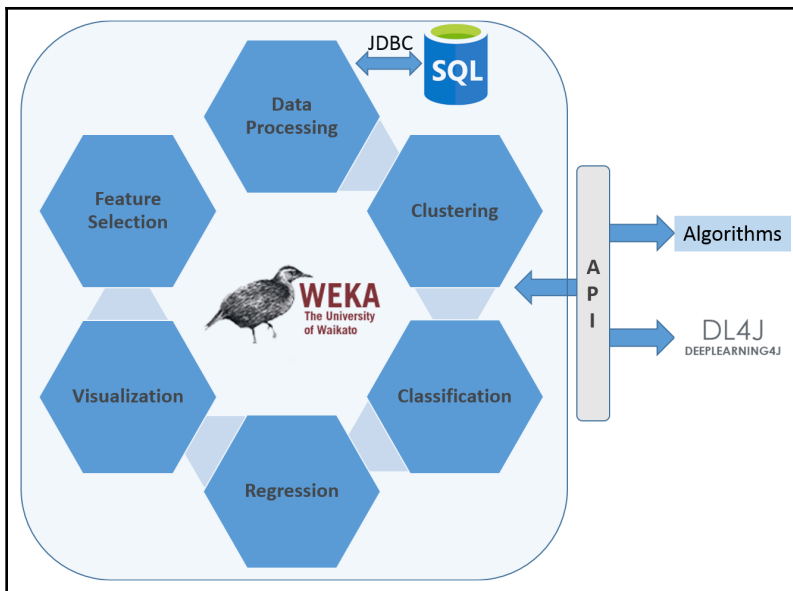
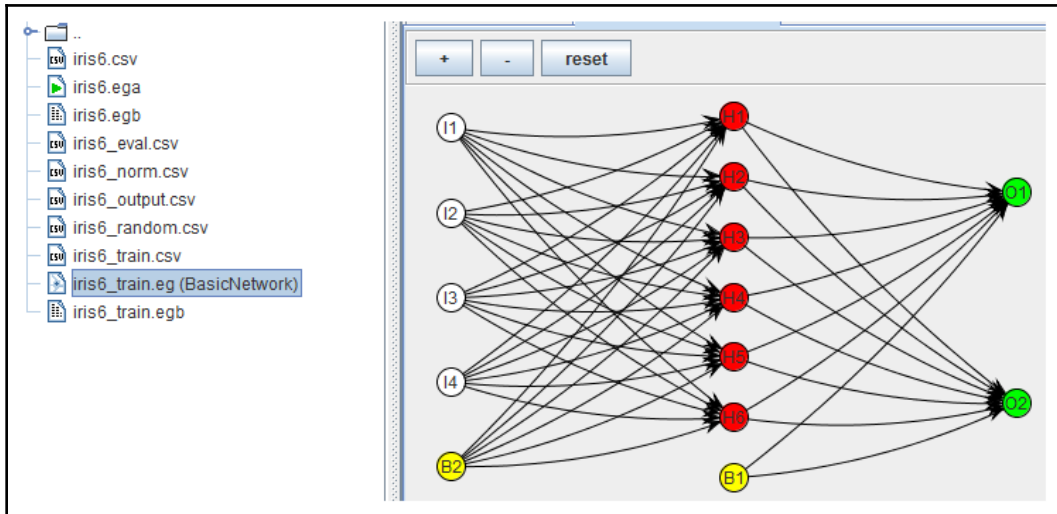
Applied to Dataset: All Datasets

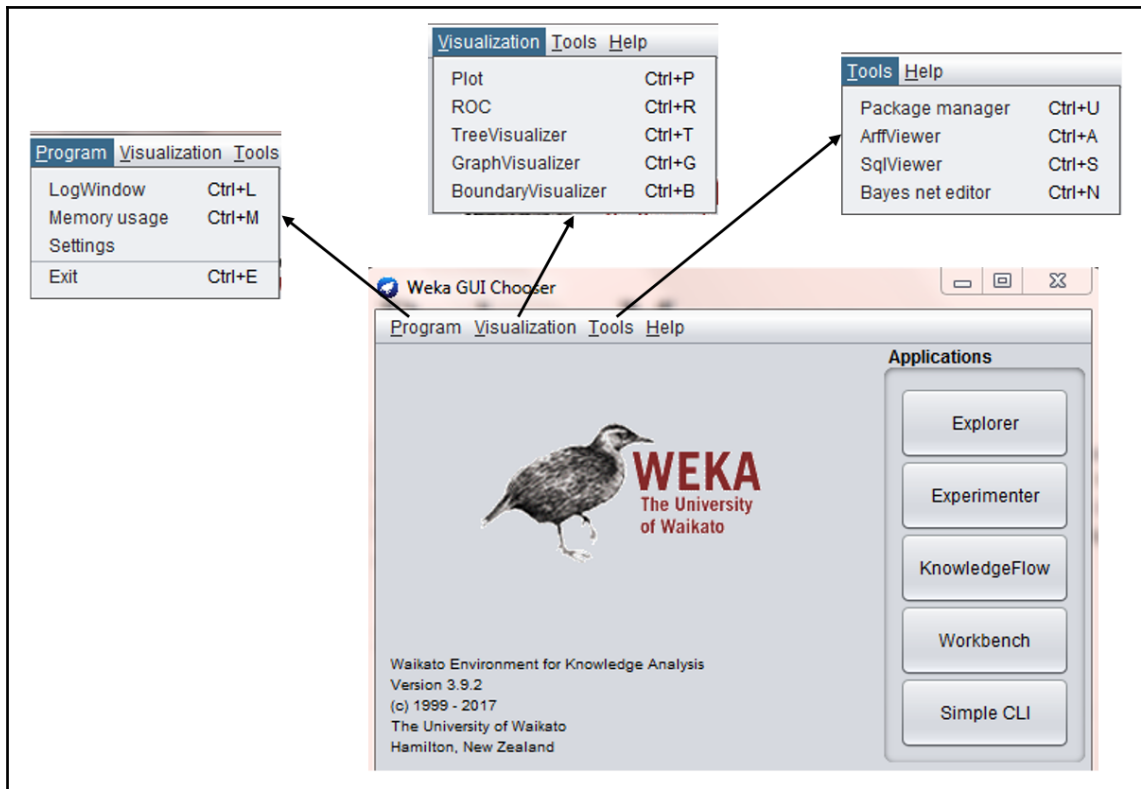
Parameters:

Parameter descriptor	Value
Cross Probability	0.7
Mutation Probability	0.01
Population Size	50
Number of Evaluations	10000
Beta Equilibrate Factor	0.99
Number of Neighbours	1

Buttons at the bottom of the dialog include 'Default Values', 'Apply', and 'Cancel'.







File>Properties

- Relation name: pima_diabetes
- # of instances: 768
- # of attributes: 9
- Class attribute: class
- # of class labels: 2

No.	1: preg	2: plas	3: pres	4: skin	5: insu	6: mass	7: pedi	8: age	9: class
	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric	Numeric	Nominal
1	1.0	0.0	48.0	20.0	0.0	24.7	0.14	22.0	tested_negative
2	1.0	0.0	74.0	20.0	23.0	27.7	0.299	21.0	tested_negative
3	1.0	0.0	68.0	35.0	0.0	32.0	0.389	22.0	tested_negative
4	5.0	44.0	62.0	0.0	0.0	25.0	0.587	36.0	tested_negative
5	2.0	56.0	56.0	28.0	45.0	24.2	0.332	22.0	tested_negative
6	9.0	57.0	80.0	37.0	0.0	32.8	0.096	41.0	tested_negative
7	0.0	57.0	60.0	0.0	0.0	21.7	0.735	67.0	tested_negative
8	3.0	61.0	82.0	28.0	0.0	34.4	0.243	46.0	tested_negative
9	7.0	62.0	78.0	0.0	0.0	32.6	0.391	41.0	tested_negative
10	8.0	65.0	72.0	23.0	0.0	32.0	0.6	42.0	tested_negative

Independent Variables

Dependent Variable

Weka Explorer

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

Open file... | Open URL... | Open DB... | Generate...

Filter: Choose None

Current relation: Relation: pima_diabetes, Instances: 768

Attributes:

Open dialog box:

- Look In: data
- Files: airline.arff, credit-g.arff, iris.2D.arff, iris.arff, labor.arff, ReutersCo, ReutersCo
- Selected: diabetes.arff
- Other files: breast-cancer.arff, glass.arff, hypothyroid.arff, ionosphere.arff, cpu.arff, cpu.with.vendor.arff
- Options: Invoke options dialog
- Note: Some file formats offer additional options which can be customized when invoking the options dialog.

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

Open file... | Open URL... | Open DB... | Generate... | Undo | Edit... | Save...

Filter: Choose **None** 1 Apply Stop

Current relation: Relation: pima_diabetes 2 Instances: 768 Attributes: 9 Sum of weights: 768

Attributes: All | None | Invert | Pattern

No.	Name
<input checked="" type="checkbox"/>	1 preg
<input type="checkbox"/>	2 plas
<input type="checkbox"/>	3 pres
<input type="checkbox"/>	4 skin
<input type="checkbox"/>	5 insu
<input type="checkbox"/>	6 mass
<input type="checkbox"/>	7 pedi
<input type="checkbox"/>	8 age
<input type="checkbox"/>	9 class

3

Remove

Status: OK 6 Log x 0

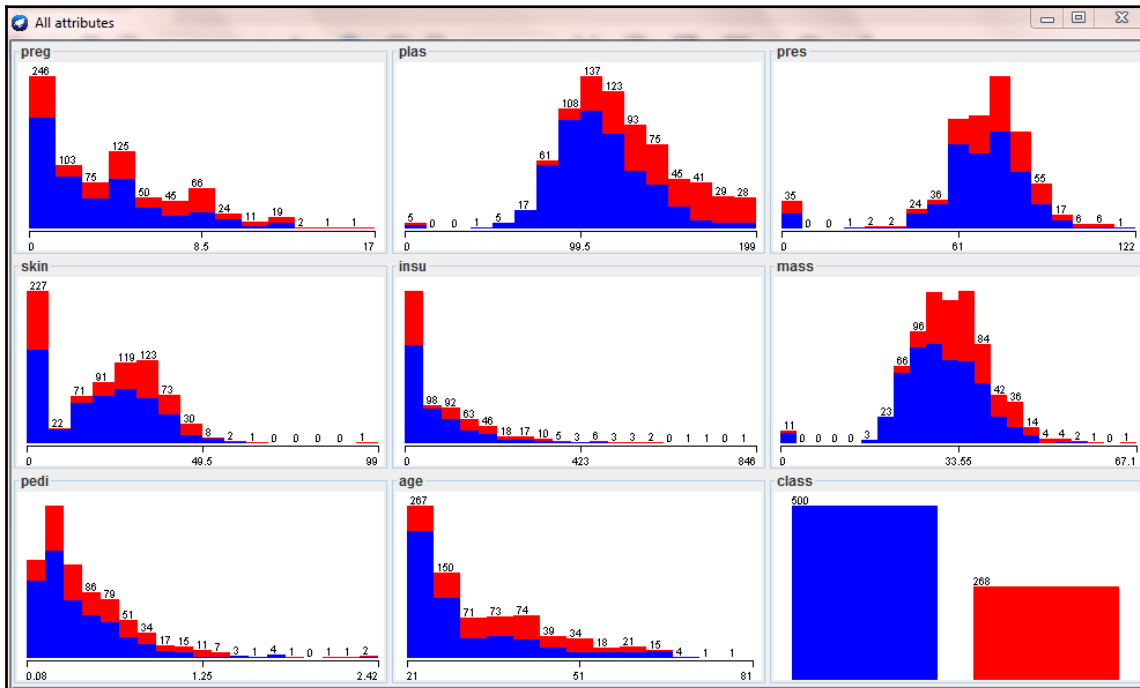
Selected attribute 4

Name: preg Missing: 0 (0%) Distinct: 17 Type: Numeric Unique: 2 (0%)

Statistic	Value
Minimum	0
Maximum	17
Mean	3.845
StdDev	3.37

Class: class (Nom) Visualize All

5



Classifier

Choose **Logistic - R 1.0E-8 - M -1 - num-decimal-places 4** (1)

Test options (3)

Use training set

Supplied test set (Set...)

Cross-validation (Folds: 10)

Percentage split (%: 80)

More options...

(Nom) class

Start Stop

Result list (right-click for options) (5)

- 17:01:42 - rules.ZeroR
- 17:02:10 - functions.MultilayerPerceptron
- 05:00:28 - functions.MultilayerPerceptron
- 05:02:55 - functions.MultilayerPerceptron
- 05:03:18 - functions.Logistic

Classifier output (4)

Time taken to build model: 0.06 seconds

=== Evaluation on test split ===

Time taken to test model on test split: 0 seconds

=== Summary ===

Correctly Classified Instances	125	81.1688 %
Incorrectly Classified Instances	29	18.8312 %
Kappa statistic	0.5384	
Mean absolute error	0.2942	
Root mean squared error	0.3768	
Relative absolute error	65.6566 %	
Root relative squared error	80.6233 %	
Total Number of Instances	154	

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
	0.914	0.408	0.828	0.914	0.869	0.547	0.836	0.884	tested_negative
	0.592	0.086	0.763	0.592	0.667	0.547	0.836	0.773	tested_positive
Weighted Avg.	0.812	0.306	0.807	0.812	0.804	0.547	0.836	0.849	

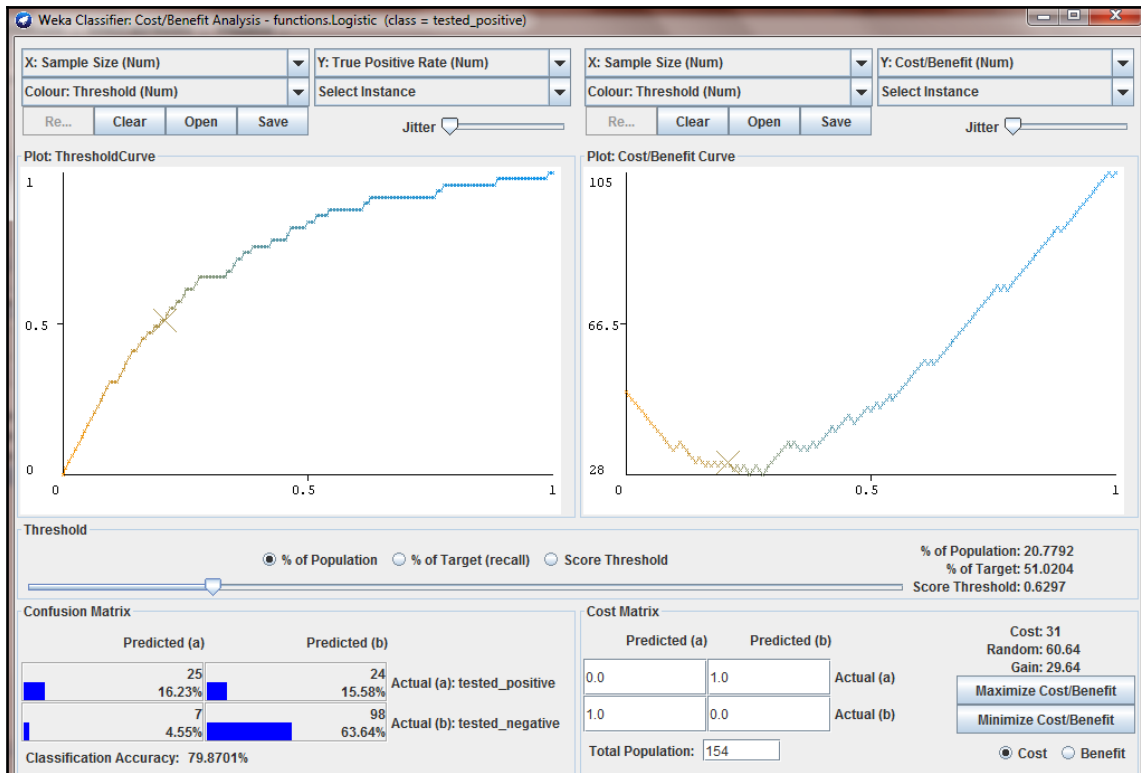
=== Confusion Matrix ===

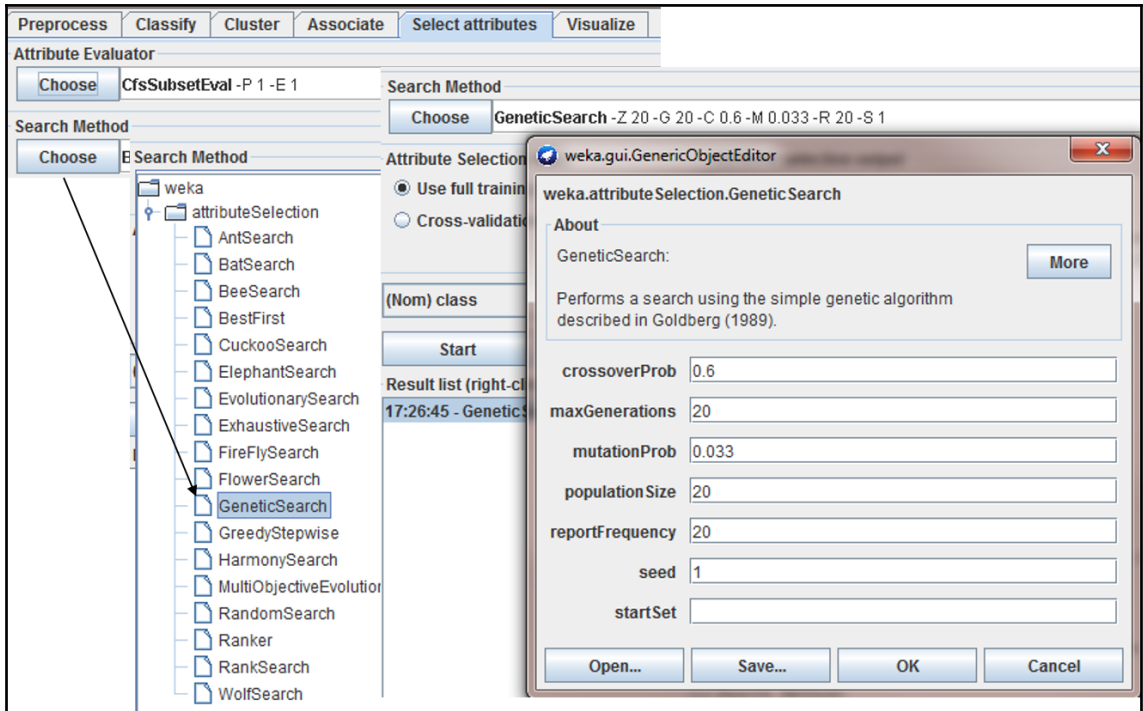
```

a b <-- classified as
96 9 | a = tested_negative
20 29 | b = tested_positive
    
```

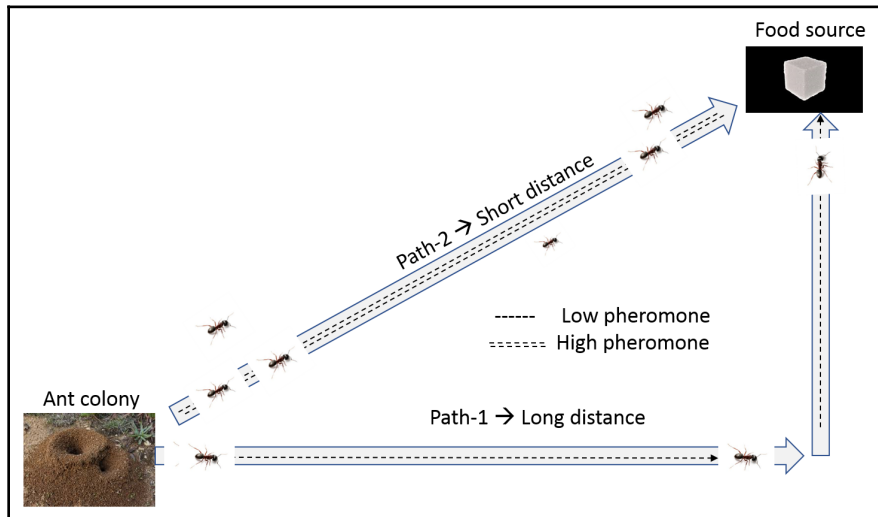
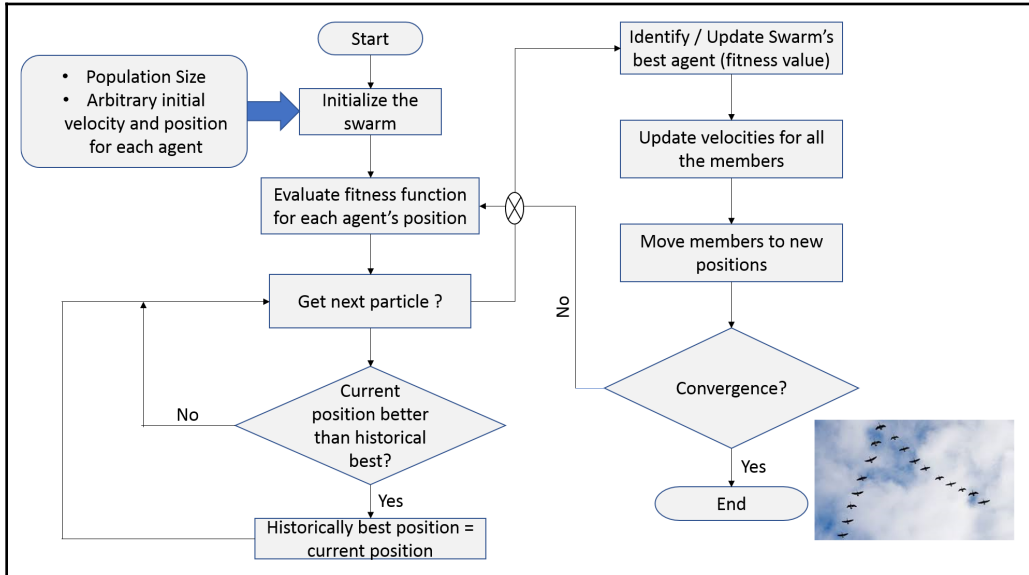
Classifier (2)

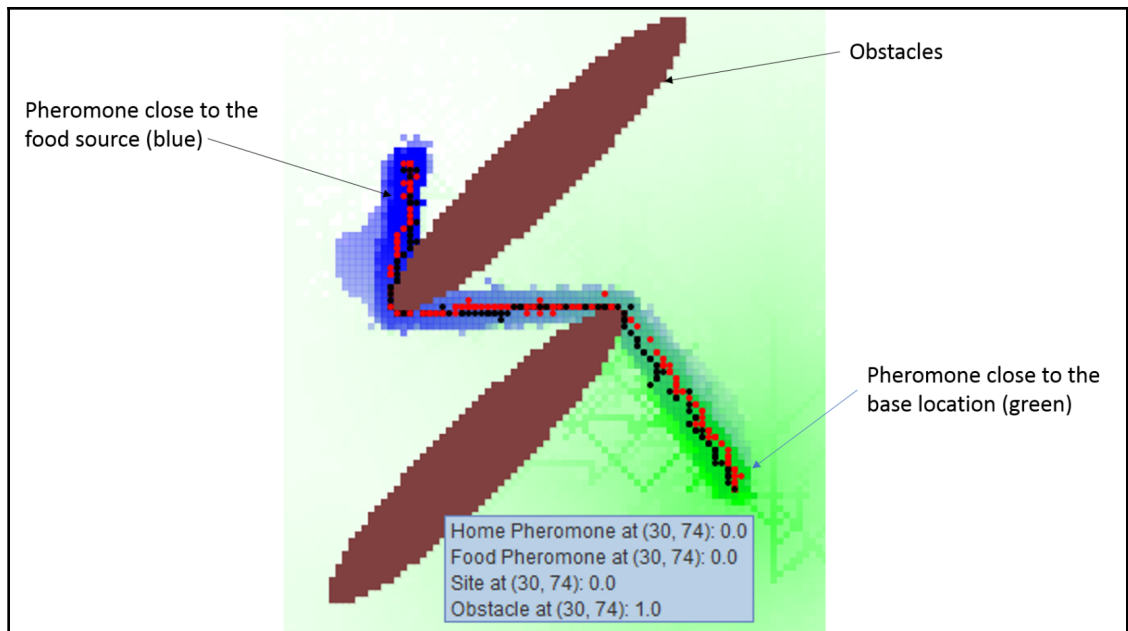
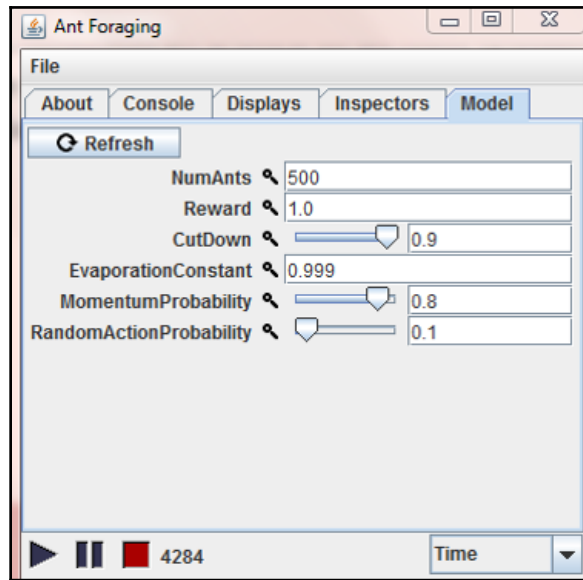
- weka
 - classifiers
 - BayesNet
 - NaiveBayes
 - NaiveBayesMultinomial
 - NaiveBayesMultinomialText
 - NaiveBayesMultinomialUpdateable
 - NaiveBayesUpdateable
 - functions
 - GaussianProcesses
 - LinearRegression
 - Logistic
 - MultilayerPerceptron
 - SGD
 - SGDText
 - SimpleLinearRegression
 - SimpleLogistic
 - SMO
 - SMOreg
 - VotedPerceptron

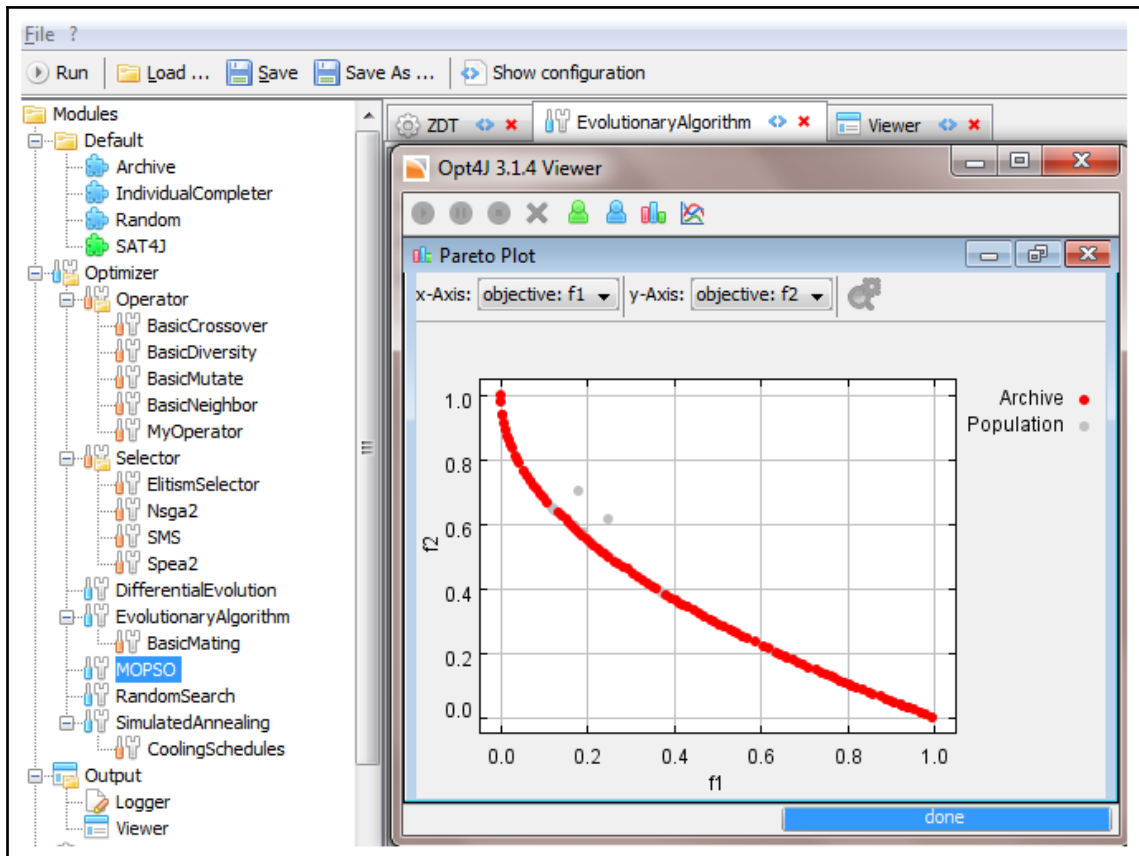


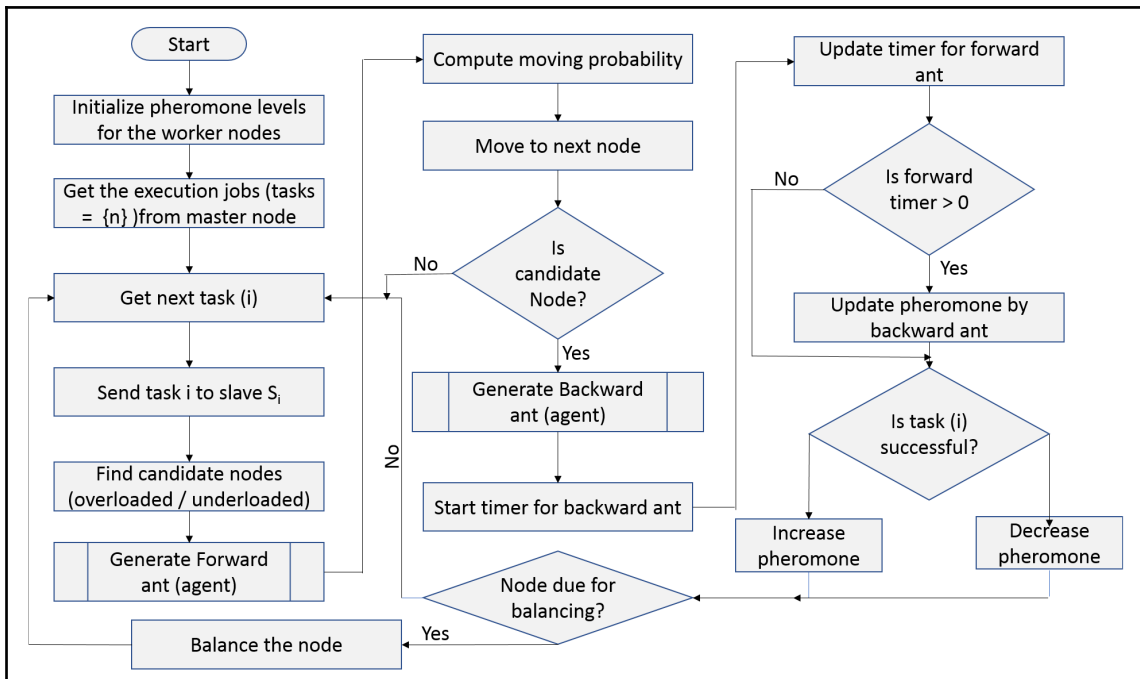


Chapter 9: Swarm Intelligence

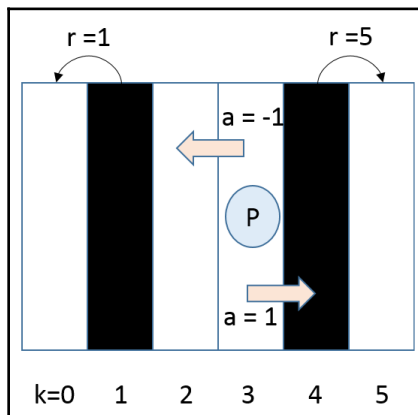
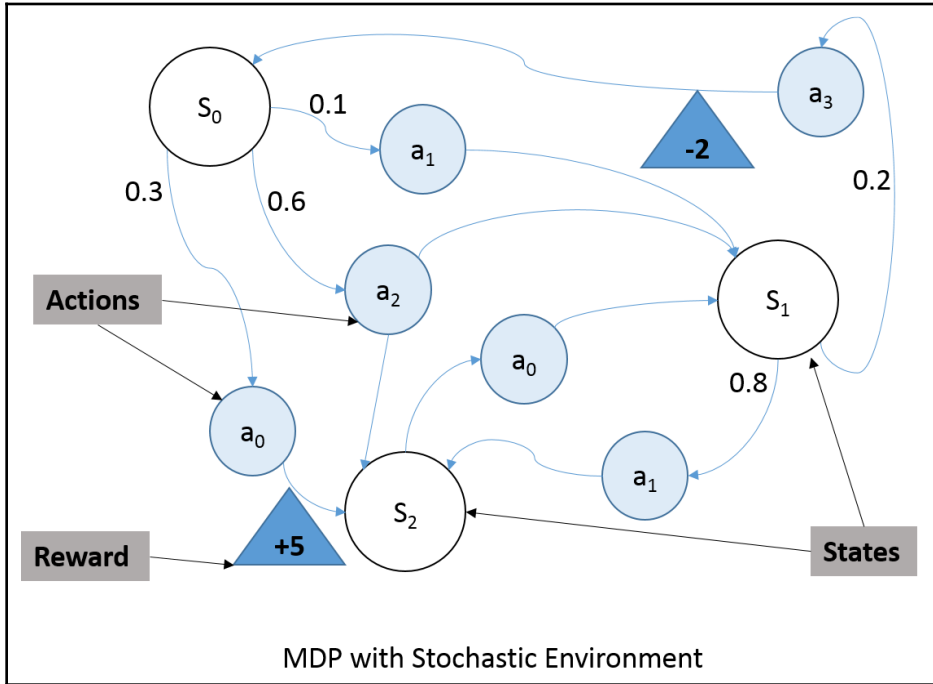




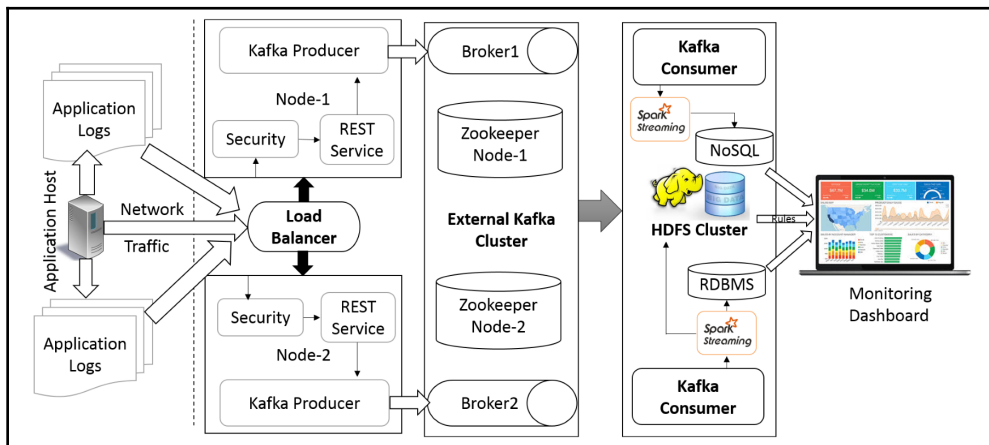
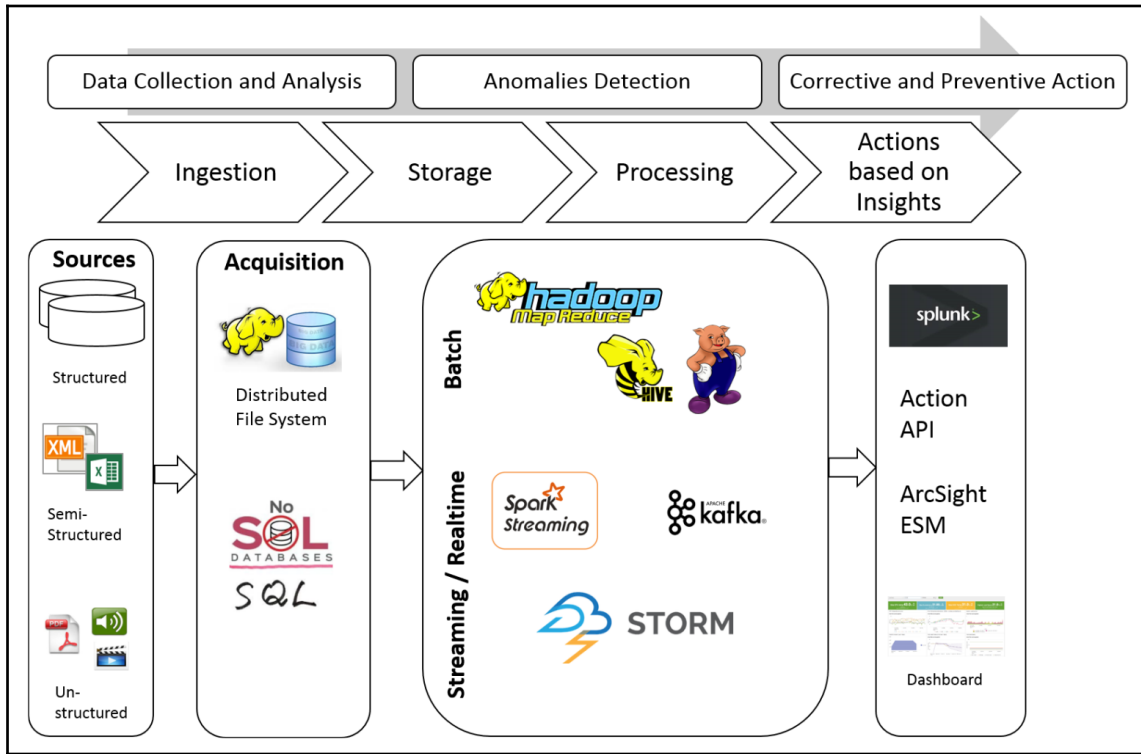


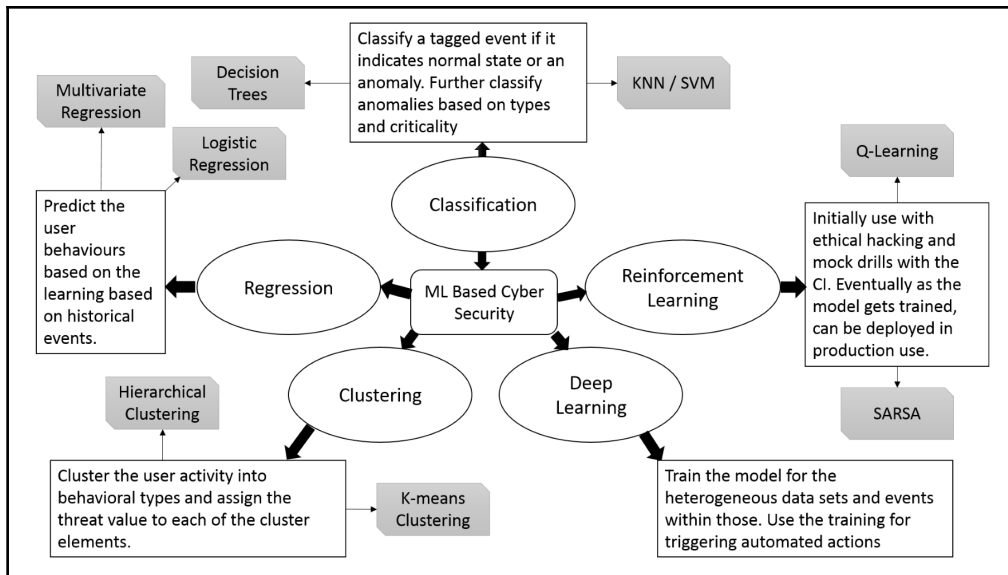
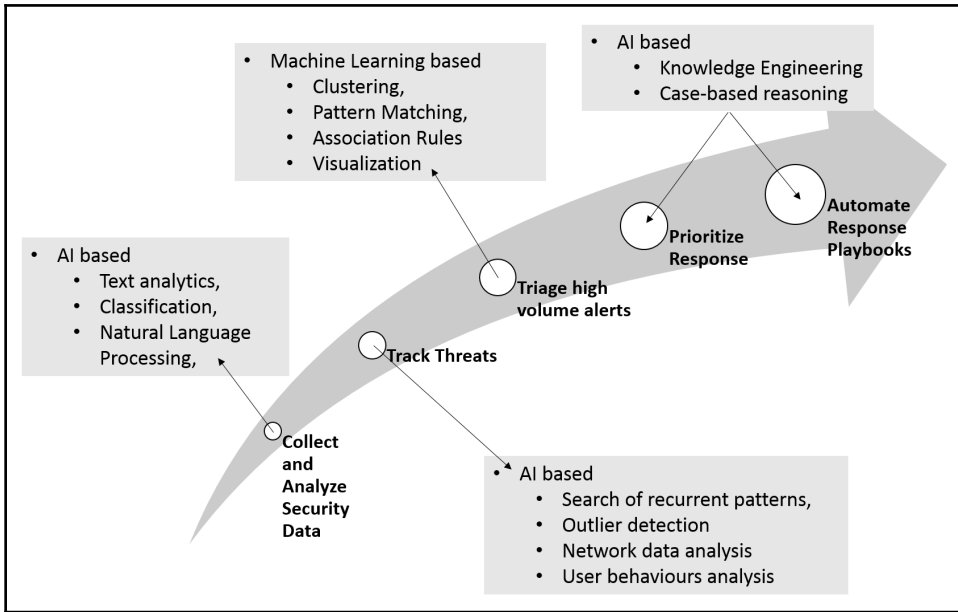


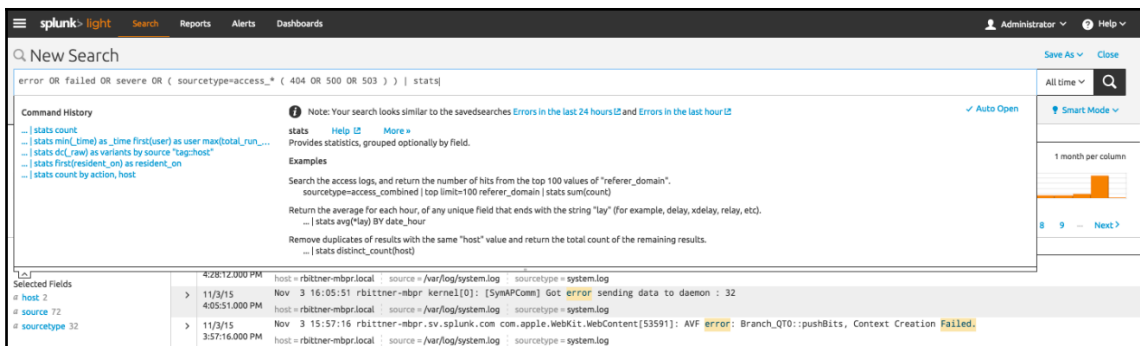
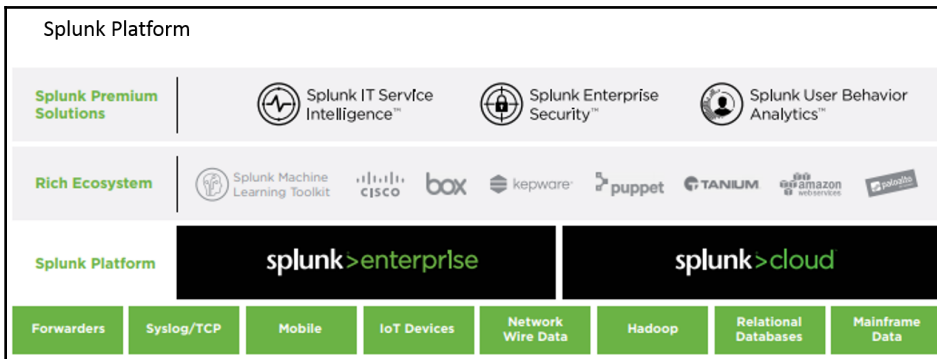
Chapter 10: Reinforcement Learning

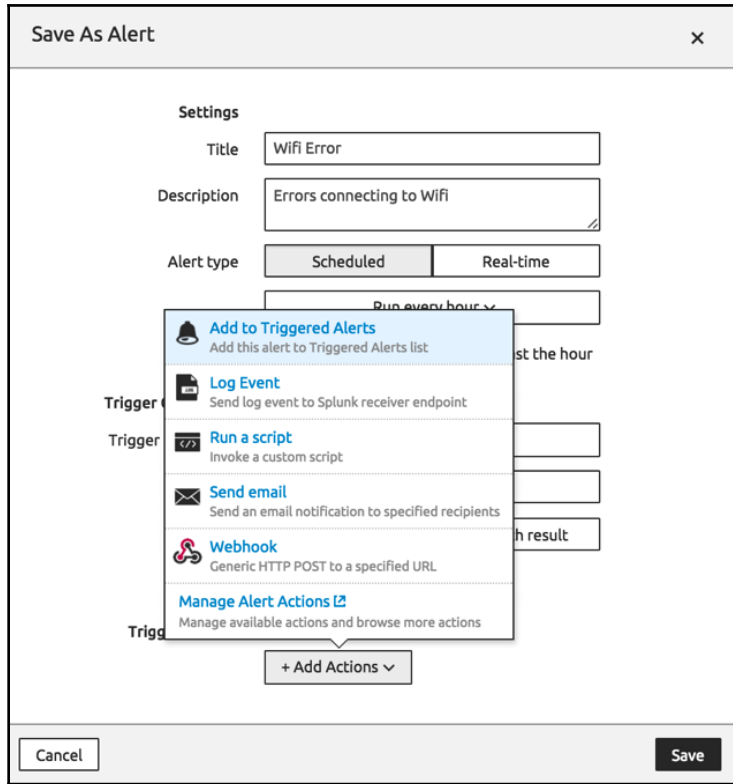


Chapter 11: Cyber Security

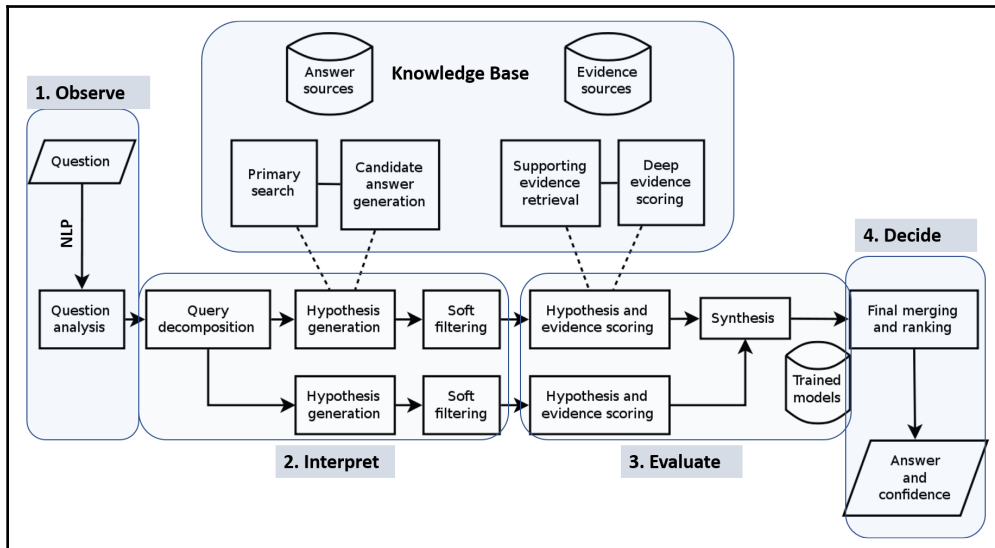
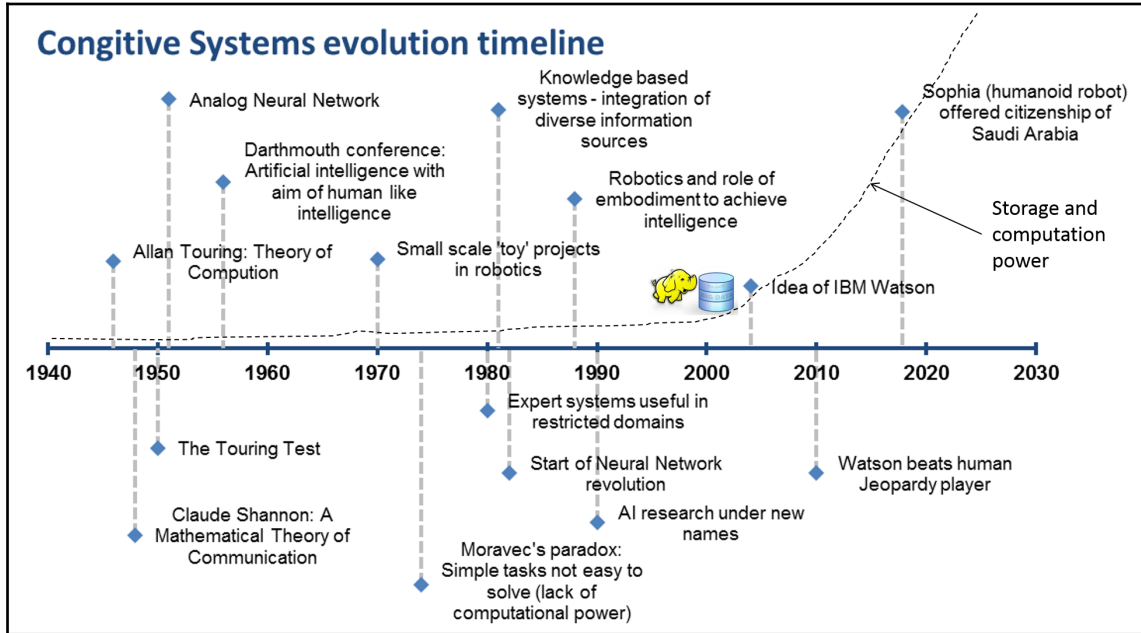


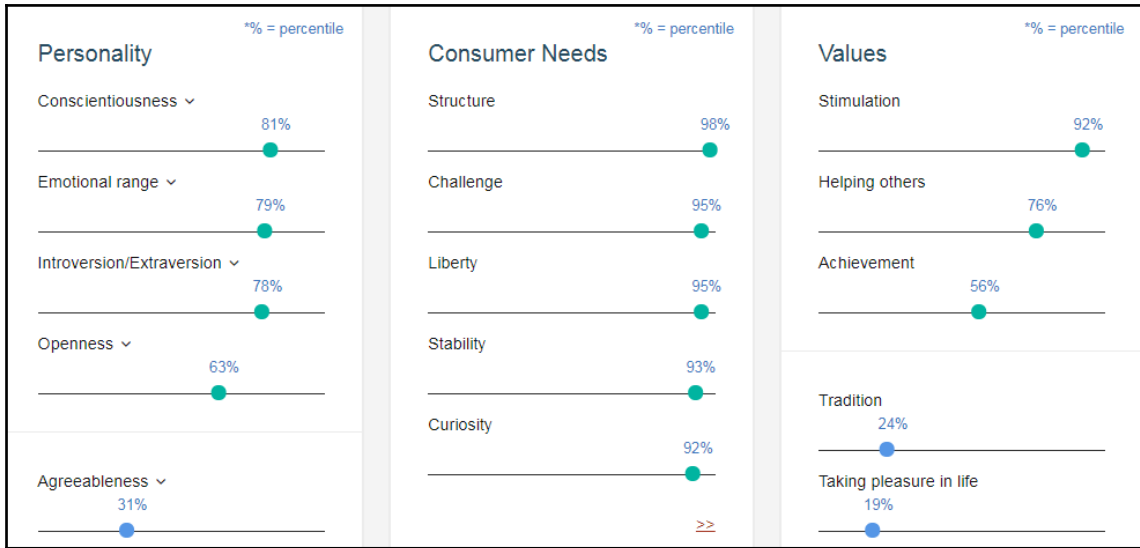






Chapter 12: Cognitive Computing





Build cognitive apps that help enhance, scale, and accelerate human expertise.

<p>Watson Assistant (formerly Conversation) Add a natural language interface to your application to automate</p> <p>Lite IBM</p>	<p>Discovery Add a cognitive search and content analytics engine to applications.</p> <p>Lite IBM</p>	<p>Knowledge Catalog Discover, catalog, and securely share enterprise data.</p> <p>Lite IBM</p>
<p>Language Translator Translate text from one language to another for specific domains.</p> <p>Lite IBM</p>	<p>Machine Learning IBM Watson Machine Learning - make smarter decisions, solve tough</p> <p>Lite IBM</p>	<p>Natural Language Understanding Analyze text to extract meta-data from content such as concepts, entities.</p> <p>Lite IBM</p>
<p>Personality Insights The Watson Personality Insights derives insights from transactional</p> <p>Lite IBM</p>	<p>Speech to Text Low-latency, streaming transcription</p> <p>Lite IBM</p>	<p>Text to Speech Synthesizes natural-sounding speech from text.</p> <p>Lite IBM</p>

The screenshot shows the IBM Watson dashboard for the 'Language Translator-j8' service. On the left is a navigation menu with options: 'Getting started', 'Manage', 'Service credentials', 'Plan', and 'Connections'. The main content area is titled 'Language Translator-j8' and shows 'Location: United Kingdom', 'Org: [redacted]', and 'Space: dev'. Below this is a 'Service credentials' section with a text box explaining that credentials are in JSON format and a 'View More' link. At the bottom right of this section is a 'New credential' button with a plus icon and a vertical ellipsis menu icon.