

Crime rate prediction using k-means

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Experiment No. 2: Classification

1. Prepare a sample data table to classify records as needed in your project
2. Define if then rules as decision tree branches
3. Justify the nodes to be placed with attributes from the relation
4. Sketch decision tree as expected using step 2 and step 3
5. Apply WEKA on table records
6. Adjust data records to obtain better tree
7. Draw the tree obtained using WEKA

1 Prepare a sample data table to classify records as needed in your project

The table of records shown in table 1 will represent the dataset used in our project.

Crime name	Area	Criminal Age	Guilty
Stealing	Ashulia	Adolescent	Misguided
Murder	Dhaka	Elderly	Self
Stealing	Dhaka	Adolescent	Self
Abuse	Savar	Middle-aged	Self
Stealing	Ashulia	Elderly	Self
Abuse	Savar	Adolescent	Misguided
Abuse	Ashulia	Elderly	Self
Cyber Crime	Ashulia	Middle-aged	Self
Abuse	Dhaka	Child	Misguided
Murder	Dhaka	Adolescent	Self
Stealing	Dhaka	Middle-aged	Self
Stealing	Ashulia	Adolescent	Misguided
Abuse	Savar	Child	Self
Abuse	Savar	Child	Self
Abuse	Ashulia	Elderly	Self
Abuse	Ashulia	Adolescent	Misguided
Cyber Crime	Ashulia	Middle-aged	Self
Cyber Crime	Dhaka	Child	Misguided
Murder	Savar	Elderly	Self
Abuse	Savar	Child	Self
Abuse	Ashulia	Adolescent	Misguided
Stealing	Savar	Middle-aged	Self
Cyber Crime	Savar	Child	Self
Murder	Ashulia	Adolescent	Misguided
Stealing	Savar	Middle-aged	Self
Murder	Ashulia	Middle-aged	Self
Murder	Dhaka	Middle-aged	Self
Drugs	Ashulia	Middle-aged	Self
Murder	Dhaka	Child	Misguided
Drugs	Ashulia	Child	Self

Table 1: Dataset used in the project

2 Define if then rules as decision tree branches

The if-then rules are defined in the pseudocode shown in algorithm 1.

Algorithm 1: If-then rules of decision tree

```
1 if age == "child" then
2   if crime == "stealing" then
3     self;
4   else
5     if area == "Dhaka" then
6       misguided;
7     else
8       self;
9     end
10  end
11 else
12   if age == "adolescent" then
13     if crime == "cybercrime" || crime == "abuse" then
14       misguided;
15     else
16       if area == "Dhaka" then
17         self;
18       else
19         misguided;
20       end
21     end
22   else
23     self;
24   end
25 end
```

- 3 Justify the nodes to be placed with attributes from the relation

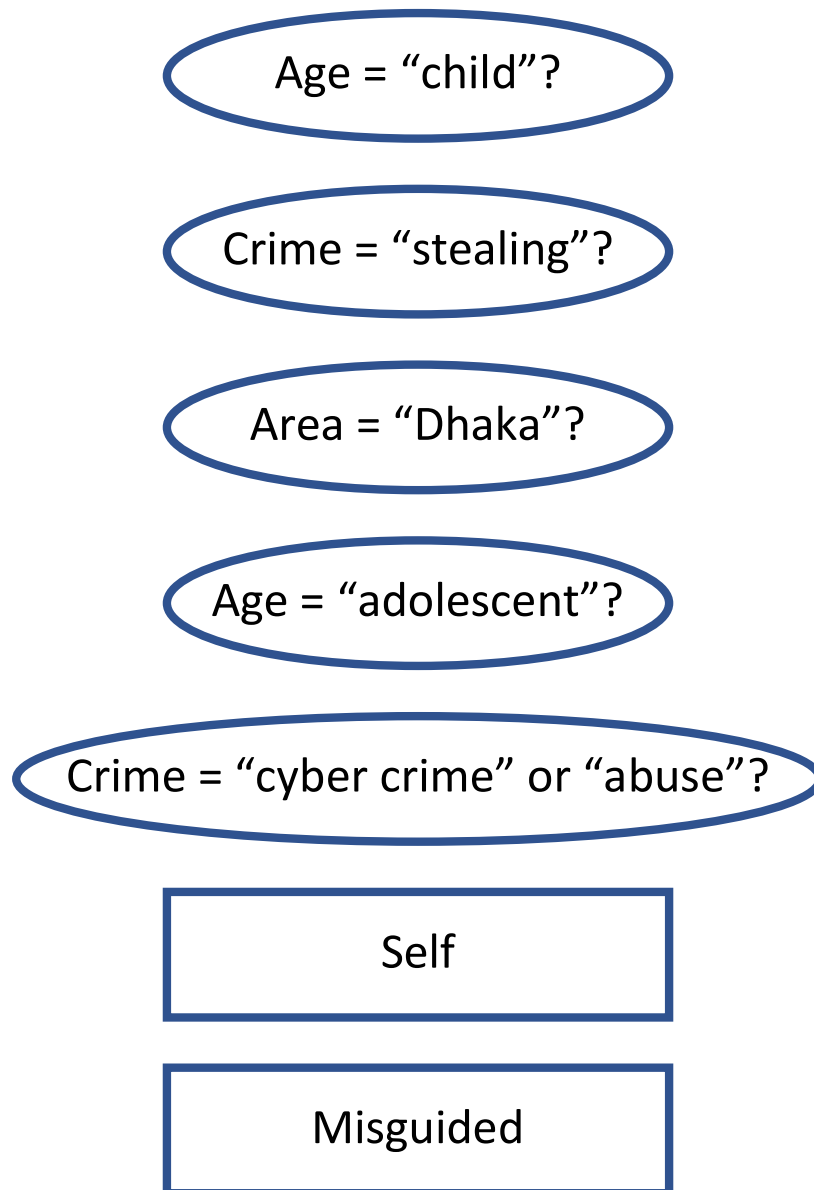


Figure 1: Nodes used in the decision tree

4 Sketch decision tree as expected using step 2 and step 3

We have sketched the decision tree in figure 2 based on the rules (algorithm 1) applied to our dataset (table 1).

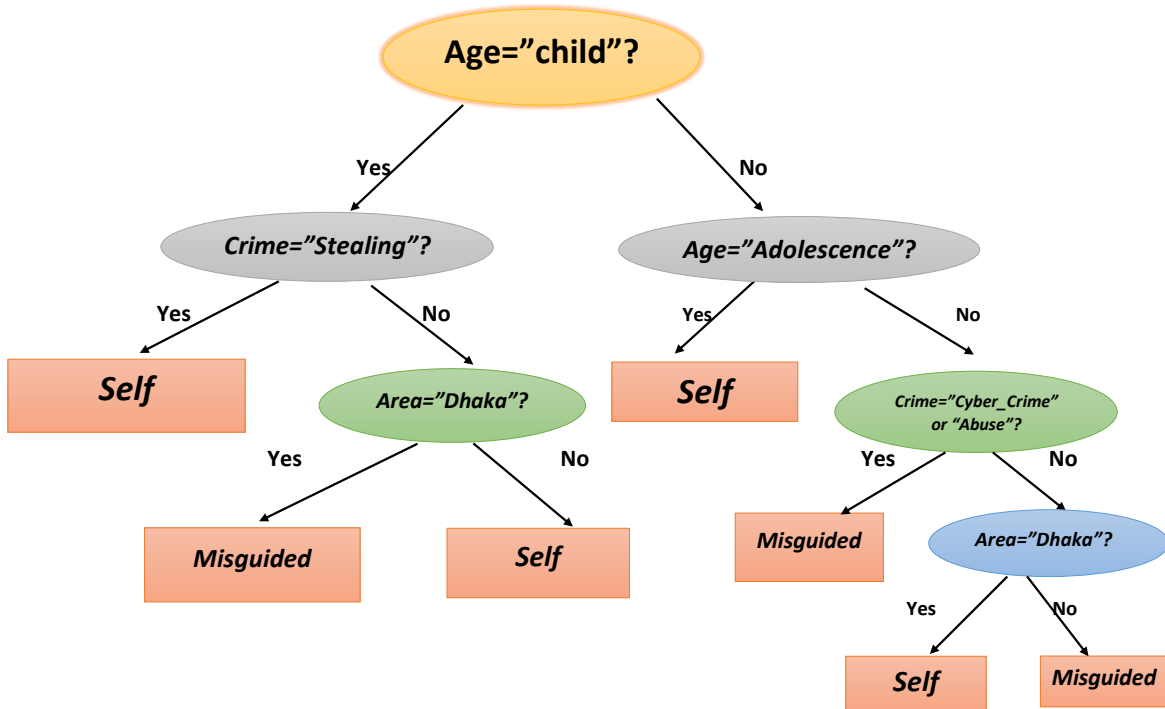


Figure 2: Sketched decision tree

5 Apply WEKA on table records

The data was converted to .csv and .arff and analysed in WEKA.

6 Adjust data records to obtain better tree

The data was appropriate to generate a proper decision tree. No records had to be modified.

7 Draw the tree obtained using WEKA

The tree shown in figure 3 was generated by WEKA as the optimal decision tree for our dataset.

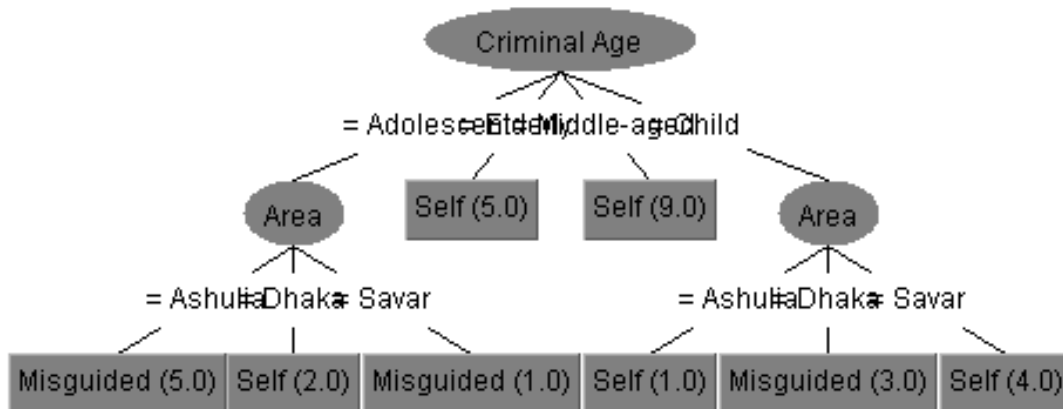


Figure 3: Optimal decision tree generated using WEKA