CS 180: Machine Problem II

Decision Tree Builder in C

Submitted by:

Dimaano, Aaron Diego I.

2013-68148

Lopez, Matthew S

2013-06417.

Introduction

Decision Tree learning is one of the methods on how Artificial Intelligence programs cognitively learn given a training set 'input', after which a test set is entered to see if the program learned from training. The algorithms under here utilizes mathematical functions which are a subset of the Information Theory domain, and that includes the Entropy and the Information Gain function. Given a training set of attributes and a target classification, the algorithms build an uneven tree by a top-down approach from which the Information Gain per attribute goes down in a descending order as the tree's levels are traversed. Entropy values, on the other hand, would be the basis for the tree's leaf nodes, which makes a tree that's optimally short and concise (shorter hypothesis is better, as by the Occam's Razor principle).

In this short Machine Problem Experiment, we utilized node structures under the C language in order to implement such a Decision Tree. A delimited text input of 50 entries would be the basis for the program's cognitive learning. There would be three experiments. The first experiment would constitute 30 random samples for the 'training set', while the remaining 20 would be associated for the 'test set', to see if the generated Decision Tree is accurate or not as much. A 5-fold cross-validation would be implemented as to test for further accuracy (averaging the percentages would be used). The second experiment would involve a much smaller data set; 15 random samples for the training set, and 10 for the testing set, all of which were derived from only the first iteration of Experiment 1's K-fold cross validation. The third experiment would involve introducing noise to Experiment 1's first iteration; that is, randomly changing five training sample data points.

Dataset

In line with the machine problem, we were also tasked to come up with a survey and provide a sample space from which both the training and test sets would be selected from. We opted to select the topic: "**Where would a DCS student eat?**", a cost efficient survey which allows us to gather respondents quickly.

The following attributes, description, and corresponding values compose the survey and our dataset:

- Budget
    - Indicates how much the student is willing to spend for that meal
    - High, Medium, Low
- Free Time
    - Indicates how free the students are to eat, regarding their schedule
    - Limited, Super Free, Just Enough
- Mode of Transportation
    - The student's preferred method of commuting to where they would like to eat
    - Public, Private, Walk
- Power to Go Far
    - The extent of ability or permission the student has to eat out
    - Far, Average, Near
- Workload
    - Indicates how free the students are to eat, regarding their work load
    - Busy, Manageable, None
- Company
    - How many people are accompanying the student out to eat
    - None, Few, Many

- Hunger
    - How hungry the student is at the time of the survey
    - Very. Not Really, Just Right
- Next Destination
    - Where the student's next destination after eating would be
    - Outside UP, Near or at DCS, A bit far from DCS, Far from DCS
- Food Place
    - The target attribute
    - Where the student would be eating
    - Katip or Technohub, Food Stalls or Canteen, New CASAA or Food Trucks, DCS, Area 2 or SC, Maginhawa

From the survey, we saw a trend that DCS students would much prefer to eat nearby, regardless of most of the survey questions, than to eat somewhere else. Based off the survey, we can assume that students from the department do not prefer eating at Maginhawa, with only one respondent answering Maginhawa.

We are also uncertain if the number of options of the target attribute affects the output, since most of the examples we found online were concerned with positive/negative target attributes.

Algorithm

The program is divided into three major segments: file reading, decision tree building or training, and testing. This section shall discuss all three segments in detail.

File Reading

File reading is the segment where the input file is read and converted into something that the program can understand and manipulate. The input file, "input.csv", is a comma-separated value file which stores the attributes and the entries for both the training and test data sets.

```
START
i ← 0
open input file
read line x from file
for all tokens t in line x
      store t as an attribute
      record t into the dictionary
rewind file
while not end of file
      read line x from file
      for all tokens t in line x
            store t as a value of line (attributes/entry) x
            if t is unique (i.e., it's the first time seeing t)
                  store t in the dictionary
END
```

The attributes are stored in the first-line, with the target attribute being the rightmost attribute of the row. The entries are stored in a similar manner, with an entry's values stored in the same order in the row as the corresponding attributes in the first row. To separate the values from the file, we read one line at a time. We then use the strtok() function, which separates the

read line into strings once they encounter the indicated tokens, which, in this case, are the commas.

Integer comparison is faster than string comparison; so, as the program reads line from the file, it also begins to assign a unique integer value to all unique read values and attributes, with all attributes listed before anything else. This is done by running the function assignUniqueID() and assigAttributeEntry(), with the said functions storing the one-to-one equivalence of the unique integers to their corresponding attributes and values into a dictionary structure.

File reading also produces an equivalentTable, often transformed (in name) to entrySet, which is essentially the input file with the converted integer values stored in a table in the form of a two-dimensional array.

```
START
curr ← linked-list of attributes/attribute structure head
attrArray ← i x j int array (i ← number of attributes, equivalent value of
attribute name; j ← number of possible values of attribute at attrArray[i])
while curr is not NULL
        for all attributes a in the structure A
              get j by counting the contents of attribute a in structure A
              attrArray[i][0] ← j
              for all attributeValues v for attribute a
                    add v to the end of attrArray[1]
END
```

Afterwards, we needed to create a dynamic array to easily track the possible values of each attribute. So, we created another two-dimensional array, attrArray, where attrArray[i][j] stores the jth possible value of the attribute with the equivalent integer value i.

It is important to note that, since the target attributes would always be at the rightmost column of the first row of entrySet, then the possible values for the target attribute would be stored in attrArray[attrCount - 1], where attrCount is the number of attributes in the case.

Also, we utilize the first element of each subarray, attrArray[i][0] to hold the number of possible values of attribute i. This procedure is very useful since it helps us know the size of the

subarray without creating a new variable, and this kind of storage makes it much easier to access the needed data compared to having another variable, which is most likely either a member of a struct or not coupled with the array itself, store the data.

```
START
considerArray[51] ← number of entries in equivalentTable + attribute row
for all entries e in equivalent table
        if entry e is to be considered
                considerArray[e] ← 1
        else
                considerArray[e] ← 0
END
```

Next is, we needed a way to note whether an entry is to be considered for training or testing. Although not explicitly in this order, this is how we select the entries we consider: we create an array, considerArray, that has the same size as the number of entries currently stored in the entrySet. The idea is, the status of considerArray[i] corresponds to the entry entrySet[i]; if considerArray[i] is set to 1, then the entry at entrySet[i] shall be considered for the testing or training process, otherwise, if considerArray[i] is set to 0, then the entry at entrySet[i] is not to be considered.

Decision Tree Building/Training

This is the segment of the program where the program constructs the decision trees based on the training sets.We do this by first constructing the considerArray for the training set, so that the program knows which entries are to be trained for. This considerArray, among a number of other parameters, are passed to a function logically based on the pseudocode from Wikipedia, found below.

```
START
ID3 (Examples, Target_Attribute, Attributes)
      create a root node Root
      if all examples are positive
            return Root with label +
      if all examples are negative
            return Root with label -
      if number of predicting attributes is empty
            return the single node tree Root with most common value of the
      target attribute in the examples as label
      else
            A ← The Attribute that best classifies examples.
            Decision Tree attribute for Root = A.
            for each possible value v of A
                  add a new tree branch below Root, corresponding to A = v
                  let Examples(v) be the subset of examples that have the value
                  v for A
                  if Examples(v) is empty
                        then below this new branch add a leaf node with label
                              = most common target value in the examples
                  Else below this new branch add the subtree ID3 (Examples(v),
                  Target_Attribute, Attributes – {A})
      End
      Return Root
END
```

The idea is to use a recursive function to build the decision tree. There are three base cases for the function which are: (1) if the current example set are all under one target attribute, in which the function creates a leaf node assigning to the said target attribute; (2) if the function has exhausted all available attributes in building the tree, then the function creates a leaf node assigning to the target attribute with the most examples; and (3) if there are no longer any examples in the example set, where the function creates a leaf node assigning to the target attribute with the most examples in the parent node's example set. However, it is important to note that the function would immediately return only in two of the three base cases: the base

cases (1) and (2). If the function fails to satisfy these two conditions, then the function only returns once all possible values in the current attribute has a node assigned to each, returning the complete node to the function call.

To detail our changes, we started by modifying the binary nature of the target attributes to accommodate the target attributes with more than two possible value. We did this by pigeonholing once a target attribute value holds all the given examples.

Calculation for the deciding attribute, decider, is done by applying the algorithm for acquiring information gain from the entropy values of all the attribute's possible values. It is also important to note that since we accommodate the plurality of values of the target attribute, we modified the base of the logarithmic functions used in solving for entropy from 2 to the number of values in the target attribute.

We also recursively use, modify, and pass the considerArray to help the function identify the examples available to it given a certain state.

Another important aspect of training is the central structure used in the recursive function: treeNode. This structure is composed of the following: attrib, an integer value which holds the attribute or target attribute integer equivalent value of the current node; terminalFlag, an integer value which acts as a tag which indicates whether the stored attrib is an attribute (terminalFlag = 0) or a target attribute value (terminalFlag = 1); numPaths, an integer value used to hold information on the number of paths a case can take from this node; pathChoice, an integer array with each array entry corresponding to the paths a case should take from this node, based on the attribute values held by the path array; and path, an array of treeNode pointers.

path and pathChoice are heavily coupled elements of this structure, especially when it comes to deciding what path to take from the current node. pathChoice[i] holds a value for an attribute value of attrib. If the tree needed to "take" the path corresponding to the value x of attribute x, then it will search for x among the values in path. Say, pathChoice[k] = x, then the tree goes to the node pointed to by path[k].

Testing

Testing is the phase where the decision tree is used to classify the test set. The algorithm is simple, it starts from the root node of the tree, checks the attribute in the case being tested, takes the corresponding path, and repeats until a terminal node/target attribute is reached.

Results

Experiment 1

Given 30 randomly selected data points for the training sample, a Decision Tree was built. The tree was printed in the console through a top-down approach and mostly, the tree was moderately large, ranging up to the 6th level. Afterwards, the tree was tested among the remaining 20 random samples. The training and testing portions were repeated five times for the K-fold cross validation approach. In general, the most common root nodes of the build Decision Tree, in line with our data samples, are **Budget, Workload,** and **Mode of Transportation**. The results (or the percentage of accuracies) of the individual iterations were slightly stable and within a definitive range; the lowest being 0% accurate, and the highest being 40% accurate. On average, the K-fold cross validation approach would yield a percentage in between 20% and 30%. Even if the executable program of this experiment were to be ran multiple times, and even if the partitioning of the sets were randomized every time the program is ran, the percentages all fall within those ranges mentioned above. We conclude that the built Decision Tree has a slightly below-average accuracy.

Experiment 2

The data partition done here was grabbed from the first iteration of the K-fold cross validation, but this time, the training and testing data sets were halved by randomly selecting data samples. This is to ensure balance in between samples. The test was run once only, and its basis would only come from Experiment 1. The results yielded similar looking trees in terms of breadth and depth, yet the results maintain almost a whopping 100% accuracy, even if the program were to be ran multiple times over random samples based off from Experiment 1. From the two experiments, we conclude so far that, most often than not, the smaller the training set, the slightly more accurate it gets, for a dataset with more than two classifications, that is. This is probably because of the nature of having more than two classifications from our selected topic. Again, there are 6 possible classifications (6 food places to choose from), which could be a major factor in determining the values of Entropy and Information Gain per attribute.

Experiment 3

      The data partition done here was also grabbed from the first iteration of the K-fold cross validation, and unlike Experiment 2's methodology, which was to randomly pick half of the training and testing data sets, Experiment 3 now deals with noise. 5 random samples from the training set were 'noised' a bit; that is, their classifications were randomly fluctuated into another classification. The test was also run only once. Upon the yielding of results, the percentages of accuracy were fairly fluctuating as well; it ranged from at least 10% accuracy to 45% accuracy as the executable file was run many times over. The results from Experiment 3 slightly differ from the previous two experiments; the results here are fairly much more accurate, yet unstable. From here we can conclude that, the introduction to noise, especially for a data set with more than two classifications (in our case, the six food places), may have an even higher chance of accuracy.

Conclusions

      Based off from the three experiments, and given the initial situations of the dataset, we now present three conclusions:

(1) Decision trees can be slightly accurate, depending on the number of classifications.

(2) For a large number of classifications, having a smaller training set may actually yield an even more accurate result.

(3) Introducing noise may or may not increase the accuracy of Decision Trees.

Sample Output

```
EXPERIMENT 1:

K-fold cross validation: K=1

Next Destination
|--> [Outside UP] Mode of Transportation
|--|--> [Private] TARGET: Katip or Technohub
|--|--> [Walk] TARGET: Area 2 or SC
|--|--> [Public] TARGET: Katip or Technohub
|--> [Near or at DCS] Power to go far
|--|--> [Far] Mode of Transportation
|--|--|--> [Private] TARGET: Katip or Technohub
|--|--|--> [Walk] TARGET: DCS
|--|--|--> [Public] TARGET: Katip or Technohub
|--|--> [Average] Company
|--|--|--> [None] Free Time
|--|--|--|--> [Limited] TARGET: Area 2 or SC
|--|--|--|--> [Super Free] Workload
|--|--|--|--|--> [Busy] TARGET: New CASAA or Food Trucks
|--|--|--|--|--> [Manageable] TARGET: Food Stalls or Canteen
|--|--|--|--|--> [None] TARGET: Food Stalls or Canteen
|--|--|--|--> [Just Enough] TARGET: Area 2 or SC
|--|--|--> [Few] Workload
|--|--|--|--> [Busy] TARGET: DCS
|--|--|--|--> [Manageable] Budget
|--|--|--|--|--> [High] TARGET: Food Stalls or Canteen
|--|--|--|--|--> [Low] TARGET: Food Stalls or Canteen
|--|--|--|--|--> [Med] Mode of Transportation
|--|--|--|--|--|--> [Private] TARGET: Food Stalls or Canteen
|--|--|--|--|--|--> [Walk] TARGET: New CASAA or Food Trucks
|--|--|--|--|--|--> [Public] TARGET: Food Stalls or Canteen
|--|--|--|--> [None] TARGET: Maginhawa
|--|--|--> [Many] TARGET: Area 2 or SC
|--|--> [Near] Company
|--|--|--> [None] TARGET: DCS
|--|--|--> [Few] TARGET: Food Stalls or Canteen
|--|--|--> [Many] TARGET: Food Stalls or Canteen
|--> [A bit far from DCS] Workload
|--|--> [Busy] TARGET: New CASAA or Food Trucks
|--|--> [Manageable] Free Time
|--|--|--> [Limited] TARGET: Katip or Technohub
|--|--|--> [Super Free] TARGET: Katip or Technohub
|--|--|--> [Just Enough] TARGET: Food Stalls or Canteen
|--|--> [None] TARGET: Food Stalls or Canteen
|--> [Far from DCS] TARGET: Area 2 or SC


ENTRY #  1
TEST CASE : [ High   Limited   Private   Far   Busy   None   Very   Outside UP   Katip or
Technohub ]
```

CONCLUSION: Katip or Technohub
HYPOTHESIS: Katip or Technohub

ENTRY # 2
TEST CASE : [Low Super Free Walk Far Busy None Not Really Outside UP Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Area 2 or SC

ENTRY # 5
TEST CASE : [Low Just Enough Public Average Busy Many Not Really Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: Area 2 or SC

ENTRY # 9
TEST CASE : [Med Just Enough Public Average Manageable Few Just Right Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 14
TEST CASE : [Med Limited Walk Near Busy None Just Right A bit far from DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 15
TEST CASE : [Low Limited Walk Near Manageable Few Just Right Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 22
TEST CASE : [Low Just Enough Walk Near Busy Few Not Really Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 25
TEST CASE : [Med Just Enough Public Far Busy Few Just Right A bit far from DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 26
TEST CASE : [Low Super Free Public Near Busy Few Very Far from DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Area 2 or SC

ENTRY # 27
TEST CASE : [Med Super Free Public Near Manageable Few Very Near or at DCS New CASAA or Food Trucks]

CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 28
TEST CASE : [High Super Free Public Far Manageable Few Just Right Outside UP Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Katip or Technohub

ENTRY # 32
TEST CASE : [Low Just Enough Walk Near Manageable Many Just Right Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 35
TEST CASE : [Med Super Free Walk Near Manageable Few Not Really Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 39
TEST CASE : [High Just Enough Walk Far Manageable None Very Near or at DCS Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: DCS

ENTRY # 41
TEST CASE : [Med Super Free Public Far Manageable Few Just Right Near or at DCS Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Katip or Technohub

ENTRY # 42
TEST CASE : [Med Limited Public Average Busy Few Just Right Far from DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Area 2 or SC

ENTRY # 43
TEST CASE : [Low Just Enough Public Average Manageable None Just Right Near or at DCS New CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: Area 2 or SC

ENTRY # 46
TEST CASE : [Med Just Enough Walk Near Busy None Just Right Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: DCS

ENTRY # 49
TEST CASE : [Med Just Enough Walk Far Manageable Many Just Right A bit far from DCS Area 2 or SC]

CONCLUSION: Area 2 or SC
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 50
TEST CASE : [Med Limited Public Near Busy Many Just Right A bit far from DCS
New CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: New CASAA or Food Trucks

Accuracy: 35.00 %

K-fold cross validation: K=2

Budget
|--> [High] Power to go far
|--|--> [Far] TARGET: Katip or Technohub
|--|--> [Average] TARGET: Katip or Technohub
|--|--> [Near] TARGET: Food Stalls or Canteen
|--> [Low] Company
|--|--> [None] Mode of Transportation
|--|--|--> [Private] TARGET: New CASAA or Food Trucks
|--|--|--> [Walk] TARGET: Food Stalls or Canteen
|--|--|--> [Public] Free Time
|--|--|--|--> [Limited] TARGET: Area 2 or SC
|--|--|--|--> [Super Free] TARGET: New CASAA or Food Trucks
|--|--|--|--> [Just Enough] TARGET: New CASAA or Food Trucks
|--|--> [Few] Hunger
|--|--|--> [Very] Free Time
|--|--|--|--> [Limited] TARGET: Food Stalls or Canteen
|--|--|--|--> [Super Free] TARGET: Food Stalls or Canteen
|--|--|--|--> [Just Enough] TARGET: Katip or Technohub
|--|--|--> [Not Really] TARGET: Food Stalls or Canteen
|--|--|--> [Just Right] TARGET: DCS
|--|--> [Many] TARGET: DCS
|--> [Med] Next Destination
|--|--> [Outside UP] TARGET: New CASAA or Food Trucks
|--|--> [Near or at DCS] Mode of Transportation
|--|--|--> [Private] TARGET: Maginhawa
|--|--|--> [Walk] Hunger
|--|--|--|--> [Very] TARGET: DCS
|--|--|--|--> [Not Really] TARGET: DCS
|--|--|--|--> [Just Right] TARGET: Food Stalls or Canteen
|--|--|--> [Public] Free Time
|--|--|--|--> [Limited] TARGET: Katip or Technohub
|--|--|--|--> [Super Free] TARGET: New CASAA or Food Trucks
|--|--|--|--> [Just Enough] TARGET: Katip or Technohub
|--|--> [A bit far from DCS] Company
|--|--|--> [None] TARGET: Food Stalls or Canteen
|--|--|--> [Few] Mode of Transportation
|--|--|--|--> [Private] TARGET: Food Stalls or Canteen
|--|--|--|--> [Walk] TARGET: Food Stalls or Canteen
|--|--|--|--> [Public] TARGET: Area 2 or SC
|--|--|--> [Many] TARGET: New CASAA or Food Trucks

|--|--> [Far from DCS] TARGET: Area 2 or SC

ENTRY # 6
TEST CASE : [Low Just Enough Walk Near Manageable None Just Right Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 8
TEST CASE : [Low Limited Public Average Busy Many Very Near or at DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: DCS

ENTRY # 9
TEST CASE : [Med Just Enough Public Average Manageable Few Just Right Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Katip or Technohub

ENTRY # 10
TEST CASE : [Low Super Free Walk Near Busy Few Just Right Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: DCS

ENTRY # 11
TEST CASE : [Low Just Enough Walk Far Busy Few Just Right Outside UP Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: DCS

ENTRY # 12
TEST CASE : [Low Just Enough Public Near Busy None Very Far from DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 13
TEST CASE : [Low Just Enough Public Average Busy Few Just Right Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: DCS

ENTRY # 19
TEST CASE : [Low Super Free Walk Average Busy Few Not Really Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 20
TEST CASE : [Low Super Free Walk Near Manageable Many Very Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen

HYPOTHESIS: DCS

ENTRY # 21
TEST CASE : [Med Just Enough Public Average Busy None Very Near or at DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Katip or Technohub

ENTRY # 23
TEST CASE : [Low Just Enough Public Near Busy Few Very Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Katip or Technohub

ENTRY # 29
TEST CASE : [Med Just Enough Walk Average Manageable Few Just Right Near or at DCS New CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 30
TEST CASE : [Med Just Enough Public Average Manageable Few Not Really Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Katip or Technohub

ENTRY # 31
TEST CASE : [Med Limited Walk Average Manageable Few Just Right A bit far from DCS Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 37
TEST CASE : [High Super Free Private Far None Few Very Near or at DCS Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Katip or Technohub

ENTRY # 38
TEST CASE : [Med Just Enough Walk Far Busy Many Just Right A bit far from DCS New CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 41
TEST CASE : [Med Super Free Public Far Manageable Few Just Right Near or at DCS Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 47
TEST CASE : [Low Super Free Public Average None None Very Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen

HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 48
TEST CASE : [Low Limited Walk Average Manageable Few Just Right Near or at DCS
Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: DCS

ENTRY # 49
TEST CASE : [Med Just Enough Walk Far Manageable Many Just Right A bit far from
DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: New CASAA or Food Trucks

Accuracy: 15.00 %

K-fold cross validation: K=3

Workload
|--> [Busy] Power to go far
|--|--> [Far] Company
|--|--|--> [None] Budget
|--|--|--|--> [High] TARGET: Food Stalls or Canteen
|--|--|--|--> [Low] TARGET: Food Stalls or Canteen
|--|--|--|--> [Med] TARGET: DCS
|--|--|--> [Few] TARGET: Area 2 or SC
|--|--|--> [Many] Mode of Transportation
|--|--|--|--> [Private] TARGET: New CASAA or Food Trucks
|--|--|--|--> [Walk] TARGET: New CASAA or Food Trucks
|--|--|--|--> [Public] TARGET: Katip or Technohub
|--|--> [Average] Free Time
|--|--|--> [Limited] TARGET: Area 2 or SC
|--|--|--> [Super Free] TARGET: New CASAA or Food Trucks
|--|--|--> [Just Enough] Budget
|--|--|--|--> [High] TARGET: DCS
|--|--|--|--> [Low] TARGET: DCS
|--|--|--|--> [Med] TARGET: Area 2 or SC
|--|--> [Near] TARGET: Food Stalls or Canteen
|--> [Manageable] Mode of Transportation
|--|--> [Private] TARGET: DCS
|--|--> [Walk] Next Destination
|--|--|--> [Outside UP] TARGET: DCS
|--|--|--> [Near or at DCS] Budget
|--|--|--|--> [High] TARGET: Katip or Technohub
|--|--|--|--> [Low] Power to go far
|--|--|--|--|--> [Far] TARGET: DCS
|--|--|--|--|--> [Average] TARGET: Food Stalls or Canteen
|--|--|--|--|--> [Near] Hunger
|--|--|--|--|--|--> [Very] TARGET: Food Stalls or Canteen
|--|--|--|--|--|--> [Not Really] TARGET: DCS
|--|--|--|--|--|--> [Just Right] TARGET: DCS
|--|--|--|--> [Med] TARGET: DCS
|--|--> [A bit far from DCS] Free Time

```
|--|--|--|--> [Limited] TARGET: Katip or Technohub
|--|--|--|--> [Super Free] TARGET: Katip or Technohub
|--|--|--|--> [Just Enough] TARGET: Area 2 or SC
|--|--|--> [Far from DCS] TARGET: DCS
|--|--> [Public] TARGET: Katip or Technohub
|--> [None] TARGET: Food Stalls or Canteen
```

ENTRY # 1
TEST CASE : [High Limited Private Far Busy None Very Outside UP Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 4
TEST CASE : [Med Just Enough Walk Average Manageable Few Just Right A bit far from DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Area 2 or SC

ENTRY # 9
TEST CASE : [Med Just Enough Public Average Manageable Few Just Right Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Katip or Technohub

ENTRY # 12
TEST CASE : [Low Just Enough Public Near Busy None Very Far from DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 13
TEST CASE : [Low Just Enough Public Average Busy Few Just Right Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: DCS

ENTRY # 16
TEST CASE : [Low Just Enough Public Near Busy Few Very Outside UP Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 19
TEST CASE : [Low Super Free Walk Average Busy Few Not Really Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 20
TEST CASE : [Low Super Free Walk Near Manageable Many Very Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 21
TEST CASE : [Med Just Enough Public Average Busy None Very Near or at DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Area 2 or SC

ENTRY # 24
TEST CASE : [Med Super Free Private Average None Few Not Really Near or at DCS Maginhawa]
CONCLUSION: Maginhawa
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 25
TEST CASE : [Med Just Enough Public Far Busy Few Just Right A bit far from DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Area 2 or SC

ENTRY # 27
TEST CASE : [Med Super Free Public Near Manageable Few Very Near or at DCS New CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: Katip or Technohub

ENTRY # 29
TEST CASE : [Med Just Enough Walk Average Manageable Few Just Right Near or at DCS New CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: DCS

ENTRY # 30
TEST CASE : [Med Just Enough Public Average Manageable Few Not Really Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Katip or Technohub

ENTRY # 33
TEST CASE : [Med Just Enough Private Average Busy Many Just Right A bit far from DCS New CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: Area 2 or SC

ENTRY # 37
TEST CASE : [High Super Free Private Far None Few Very Near or at DCS Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 42
TEST CASE : [Med Limited Public Average Busy Few Just Right Far from DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Area 2 or SC

```
ENTRY #  43
TEST CASE : [ Low  Just Enough  Public  Average  Manageable  None  Just Right  Near or
at DCS  New CASAA or Food Trucks ]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: Katip or Technohub

ENTRY #  45
TEST CASE : [ Low  Limited  Public  Average  Manageable  None  Just Right  Near or at
DCS  Area 2 or SC ]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Katip or Technohub

ENTRY #  50
TEST CASE : [ Med  Limited  Public  Near  Busy  Many  Just Right  A bit far from DCS
New CASAA or Food Trucks ]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: Food Stalls or Canteen

Accuracy: 25.00 %


K-fold cross validation: K=4

Hunger
|--> [Very] Next Destination
|--|--> [Outside UP] TARGET: Katip or Technohub
|--|--> [Near or at DCS] Free Time
|--|--|--> [Limited] TARGET: Area 2 or SC
|--|--|--> [Super Free] TARGET: Food Stalls or Canteen
|--|--|--> [Just Enough] TARGET: Food Stalls or Canteen
|--|--> [A bit far from DCS] TARGET: Food Stalls or Canteen
|--|--> [Far from DCS] TARGET: Food Stalls or Canteen
|--> [Not Really] Next Destination
|--|--> [Outside UP] TARGET: Food Stalls or Canteen
|--|--> [Near or at DCS] Mode of Transportation
|--|--|--> [Private] TARGET: Maginhawa
|--|--|--> [Walk] TARGET: DCS
|--|--|--> [Public] Budget
|--|--|--|--> [High] TARGET: Food Stalls or Canteen
|--|--|--|--> [Low] TARGET: DCS
|--|--|--|--> [Med] TARGET: Food Stalls or Canteen
|--|--> [A bit far from DCS] TARGET: Food Stalls or Canteen
|--|--> [Far from DCS] TARGET: Food Stalls or Canteen
|--> [Just Right] Budget
|--|--> [High] TARGET: Area 2 or SC
|--|--> [Low] Next Destination
|--|--|--> [Outside UP] TARGET: Area 2 or SC
|--|--|--> [Near or at DCS] Company
|--|--|--|--> [None] Free Time
|--|--|--|--|--> [Limited] TARGET: Area 2 or SC
|--|--|--|--|--> [Super Free] TARGET: New CASAA or Food Trucks
|--|--|--|--|--> [Just Enough] TARGET: New CASAA or Food Trucks
|--|--|--|--> [Few] Free Time
```

```
|--|--|--|--|--> [Limited] TARGET: DCS
|--|--|--|--|--> [Super Free] TARGET: Food Stalls or Canteen
|--|--|--|--|--> [Just Enough] TARGET: DCS
|--|--|--|--> [Many] TARGET: DCS
|--|--|--> [A bit far from DCS] TARGET: DCS
|--|--|--> [Far from DCS] TARGET: DCS
|--|--> [Med] Next Destination
|--|--|--> [Outside UP] TARGET: Food Stalls or Canteen
|--|--|--> [Near or at DCS] Power to go far
|--|--|--|--> [Far] TARGET: Katip or Technohub
|--|--|--|--> [Average] TARGET: Food Stalls or Canteen
|--|--|--|--> [Near] TARGET: Food Stalls or Canteen
|--|--|--> [A bit far from DCS] Company
|--|--|--|--> [None] TARGET: Food Stalls or Canteen
|--|--|--|--> [Few] TARGET: Katip or Technohub
|--|--|--|--> [Many] Mode of Transportation
|--|--|--|--|--> [Private] TARGET: New CASAA or Food Trucks
|--|--|--|--|--> [Walk] TARGET: Area 2 or SC
|--|--|--|--|--> [Public] TARGET: New CASAA or Food Trucks
|--|--|--> [Far from DCS] TARGET: Area 2 or SC
```

ENTRY # 4
TEST CASE : [Med Just Enough Walk Average Manageable Few Just Right A bit far
from DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Katip or Technohub

ENTRY # 6
TEST CASE : [Low Just Enough Walk Near Manageable None Just Right Near or at
DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 7
TEST CASE : [Low Limited Walk Near Manageable Few Very Near or at DCS Food
Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Area 2 or SC

ENTRY # 12
TEST CASE : [Low Just Enough Public Near Busy None Very Far from DCS Area 2 or
SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 18
TEST CASE : [Med Just Enough Walk Far Busy None Very Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 21
TEST CASE : [Med Just Enough Public Average Busy None Very Near or at DCS Area
2 or SC]
CONCLUSION: Area 2 or SC

HYPOTHESIS: Food Stalls or Canteen

ENTRY # 22
TEST CASE : [Low Just Enough Walk Near Busy Few Not Really Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: DCS

ENTRY # 25
TEST CASE : [Med Just Enough Public Far Busy Few Just Right A bit far from DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Katip or Technohub

ENTRY # 27
TEST CASE : [Med Super Free Public Near Manageable Few Very Near or at DCS New CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 28
TEST CASE : [High Super Free Public Far Manageable Few Just Right Outside UP Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Area 2 or SC

ENTRY # 29
TEST CASE : [Med Just Enough Walk Average Manageable Few Just Right Near or at DCS New CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 32
TEST CASE : [Low Just Enough Walk Near Manageable Many Just Right Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: DCS

ENTRY # 35
TEST CASE : [Med Super Free Walk Near Manageable Few Not Really Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: DCS

ENTRY # 37
TEST CASE : [High Super Free Private Far None Few Very Near or at DCS Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 38
TEST CASE : [Med Just Enough Walk Far Busy Many Just Right A bit far from DCS New CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks

HYPOTHESIS: Area 2 or SC

ENTRY # 39
TEST CASE : [High Just Enough Walk Far Manageable None Very Near or at DCS
Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 40
TEST CASE : [Med Limited Walk Far Busy Many Very A bit far from DCS New CASAA
or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 41
TEST CASE : [Med Super Free Public Far Manageable Few Just Right Near or at DCS
Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Katip or Technohub

ENTRY # 43
TEST CASE : [Low Just Enough Public Average Manageable None Just Right Near or
at DCS New CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 48
TEST CASE : [Low Limited Walk Average Manageable Few Just Right Near or at DCS
Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: DCS

Accuracy: 20.00 %

K-fold cross validation: K=5

Hunger
|--> [Very] Budget
|--|--> [High] TARGET: Katip or Technohub
|--|--> [Low] TARGET: Food Stalls or Canteen
|--|--> [Med] TARGET: New CASAA or Food Trucks
|--> [Not Really] Next Destination
|--|--> [Outside UP] TARGET: Food Stalls or Canteen
|--|--> [Near or at DCS] Company
|--|--|--> [None] TARGET: DCS
|--|--|--> [Few] Mode of Transportation
|--|--|--|--> [Private] TARGET: DCS
|--|--|--|--> [Walk] TARGET: DCS
|--|--|--|--> [Public] TARGET: Food Stalls or Canteen
|--|--|--> [Many] TARGET: DCS
|--|--> [A bit far from DCS] TARGET: Food Stalls or Canteen
|--|--> [Far from DCS] TARGET: DCS
|--> [Just Right] Budget

```
|--|--> [High] TARGET: New CASAA or Food Trucks
|--|--> [Low] Power to go far
|--|--|--> [Far] TARGET: Area 2 or SC
|--|--|--> [Average] Free Time
|--|--|--|--> [Limited] TARGET: Area 2 or SC
|--|--|--|--> [Super Free] TARGET: New CASAA or Food Trucks
|--|--|--|--> [Just Enough] TARGET: New CASAA or Food Trucks
|--|--|--> [Near] TARGET: DCS
|--|--> [Med] Free Time
|--|--|--> [Limited] TARGET: Food Stalls or Canteen
|--|--|--> [Super Free] TARGET: Katip or Technohub
|--|--|--> [Just Enough] Workload
|--|--|--|--> [Busy] Mode of Transportation
|--|--|--|--|--> [Private] TARGET: New CASAA or Food Trucks
|--|--|--|--|--> [Walk] TARGET: New CASAA or Food Trucks
|--|--|--|--|--> [Public] TARGET: Katip or Technohub
|--|--|--|--> [Manageable] Power to go far
|--|--|--|--|--> [Far] TARGET: Area 2 or SC
|--|--|--|--|--> [Average] Company
|--|--|--|--|--|--> [None] TARGET: Food Stalls or Canteen
|--|--|--|--|--|--> [Few] Mode of Transportation
|--|--|--|--|--|--|--> [Private] TARGET: Food Stalls or Canteen
|--|--|--|--|--|--|--> [Walk] Next Destination
|--|--|--|--|--|--|--|--> [Outside UP] TARGET: Food Stalls or Canteen
|--|--|--|--|--|--|--|--> [Near or at DCS] TARGET: New CASAA or Food Trucks
|--|--|--|--|--|--|--|--> [A bit far from DCS] TARGET: Food Stalls or Canteen
|--|--|--|--|--|--|--|--> [Far from DCS] TARGET: Food Stalls or Canteen
|--|--|--|--|--|--|--> [Public] TARGET: Food Stalls or Canteen
|--|--|--|--|--|--> [Many] TARGET: Food Stalls or Canteen
|--|--|--|--|--> [Near] TARGET: Food Stalls or Canteen
|--|--|--|--> [None] TARGET: New CASAA or Food Trucks
```

ENTRY # 6
TEST CASE : [Low Just Enough Walk Near Manageable None Just Right Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: DCS

ENTRY # 7
TEST CASE : [Low Limited Walk Near Manageable Few Very Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 8
TEST CASE : [Low Limited Public Average Busy Many Very Near or at DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 10
TEST CASE : [Low Super Free Walk Near Busy Few Just Right Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen

HYPOTHESIS: DCS

ENTRY # 12
TEST CASE : [Low Just Enough Public Near Busy None Very Far from DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 13
TEST CASE : [Low Just Enough Public Average Busy Few Just Right Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 16
TEST CASE : [Low Just Enough Public Near Busy Few Very Outside UP Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 18
TEST CASE : [Med Just Enough Walk Far Busy None Very Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 20
TEST CASE : [Low Super Free Walk Near Manageable Many Very Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 21
TEST CASE : [Med Just Enough Public Average Busy None Very Near or at DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 22
TEST CASE : [Low Just Enough Walk Near Busy Few Not Really Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: DCS

ENTRY # 24
TEST CASE : [Med Super Free Private Average None Few Not Really Near or at DCS Maginhawa]
CONCLUSION: Maginhawa
HYPOTHESIS: DCS

ENTRY # 25
TEST CASE : [Med Just Enough Public Far Busy Few Just Right A bit far from DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Katip or Technohub

```
ENTRY #  28
TEST CASE : [ High  Super Free  Public  Far  Manageable  Few  Just Right  Outside UP
Katip or Technohub ]
CONCLUSION: Katip or Technohub
HYPOTHESIS: New CASAA or Food Trucks


ENTRY #  31
TEST CASE : [ Med  Limited  Walk  Average  Manageable  Few  Just Right  A bit far from
DCS  Katip or Technohub ]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Food Stalls or Canteen


ENTRY #  36
TEST CASE : [ Med  Just Enough  Walk  Average  Busy  Few  Just Right  Far from DCS
Area 2 or SC ]
CONCLUSION: Area 2 or SC
HYPOTHESIS: New CASAA or Food Trucks


ENTRY #  42
TEST CASE : [ Med  Limited  Public  Average  Busy  Few  Just Right  Far from DCS  Area
2 or SC ]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Food Stalls or Canteen


ENTRY #  46
TEST CASE : [ Med  Just Enough  Walk  Near  Busy  None  Just Right  Near or at DCS
Food Stalls or Canteen ]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: New CASAA or Food Trucks


ENTRY #  48
TEST CASE : [ Low  Limited  Walk  Average  Manageable  Few  Just Right  Near or at DCS
Food Stalls or Canteen ]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Area 2 or SC


ENTRY #  50
TEST CASE : [ Med  Limited  Public  Near  Busy  Many  Just Right  A bit far from DCS
New CASAA or Food Trucks ]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: Food Stalls or Canteen


Accuracy: 15.00 %

Average accuracy of Decision Tree for Experiment 1: 22.00 %




EXPERIMENT 2:

Workload
|--> [Busy] Next Destination
|--|--> [Outside UP] TARGET: Area 2 or SC
```

```
|--|--> [Near or at DCS] Hunger
|--|--|--> [Very] TARGET: Area 2 or SC
|--|--|--> [Not Really] TARGET: DCS
|--|--|--> [Just Right] TARGET: New CASAA or Food Trucks
|--|--> [A bit far from DCS] TARGET: New CASAA or Food Trucks
|--|--> [Far from DCS] Budget
|--|--|--> [High] TARGET: Food Stalls or Canteen
|--|--|--> [Low] TARGET: Food Stalls or Canteen
|--|--|--> [Med] TARGET: Area 2 or SC
|--> [Manageable] Next Destination
|--|--> [Outside UP] TARGET: Katip or Technohub
|--|--> [Near or at DCS] Mode of Transportation
|--|--|--> [Private] TARGET: Food Stalls or Canteen
|--|--|--> [Walk] Power to go far
|--|--|--|--> [Far] TARGET: DCS
|--|--|--|--> [Average] TARGET: Food Stalls or Canteen
|--|--|--|--> [Near] Company
|--|--|--|--|--> [None] TARGET: DCS
|--|--|--|--|--> [Few] TARGET: DCS
|--|--|--|--|--> [Many] TARGET: Food Stalls or Canteen
|--|--|--> [Public] Power to go far
|--|--|--|--> [Far] TARGET: Katip or Technohub
|--|--|--|--> [Average] Budget
|--|--|--|--|--> [High] TARGET: Food Stalls or Canteen
|--|--|--|--|--> [Low] TARGET: New CASAA or Food Trucks
|--|--|--|--|--> [Med] TARGET: Food Stalls or Canteen
|--|--|--|--> [Near] TARGET: New CASAA or Food Trucks
|--|--> [A bit far from DCS] TARGET: Katip or Technohub
|--|--> [Far from DCS] TARGET: Food Stalls or Canteen
|--> [None] Mode of Transportation
|--|--> [Private] TARGET: Katip or Technohub
|--|--> [Walk] TARGET: Food Stalls or Canteen
|--|--> [Public] TARGET: Food Stalls or Canteen

ENTRY # 5
TEST CASE : [ Low  Just Enough  Public  Average  Busy  Many  Not Really  Near or at DCS
DCS ]
CONCLUSION: DCS
HYPOTHESIS: DCS


ENTRY # 9
TEST CASE : [ Med  Just Enough  Public  Average  Manageable  Few  Just Right  Near or
at DCS  Food Stalls or Canteen ]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Food Stalls or Canteen


ENTRY # 26
TEST CASE : [ Low  Super Free  Public  Near  Busy  Few  Very  Far from DCS  Food Stalls
or Canteen ]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Food Stalls or Canteen


ENTRY # 27
```

TEST CASE : [Med Super Free Public Near Manageable Few Very Near or at DCS New CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 28
TEST CASE : [High Super Free Public Far Manageable Few Just Right Outside UP Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Katip or Technohub

ENTRY # 35
TEST CASE : [Med Super Free Walk Near Manageable Few Not Really Near or at DCS DCS]
CONCLUSION: DCS
HYPOTHESIS: DCS

ENTRY # 41
TEST CASE : [Med Super Free Public Far Manageable Few Just Right Near or at DCS Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Katip or Technohub

ENTRY # 42
TEST CASE : [Med Limited Public Average Busy Few Just Right Far from DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Area 2 or SC

ENTRY # 43
TEST CASE : [Low Just Enough Public Average Manageable None Just Right Near or at DCS New CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 50
TEST CASE : [Med Limited Public Near Busy Many Just Right A bit far from DCS New CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: New CASAA or Food Trucks

Accuracy: 100.00 %

EXPERIMENT 3:

Next Destination
|--> [Outside UP] Mode of Transportation
|--|--> [Private] TARGET: Katip or Technohub
|--|--> [Walk] TARGET: Area 2 or SC
|--|--> [Public] TARGET: Katip or Technohub
|--> [Near or at DCS] Budget

```
|--|--> [High] TARGET: Katip or Technohub
|--|--> [Low] Hunger
|--|--|--> [Very] Mode of Transportation
|--|--|--|--> [Private] TARGET: Food Stalls or Canteen
|--|--|--|--> [Walk] TARGET: Food Stalls or Canteen
|--|--|--|--> [Public] Free Time
|--|--|--|--|--> [Limited] TARGET: Area 2 or SC
|--|--|--|--|--> [Super Free] TARGET: Food Stalls or Canteen
|--|--|--|--|--> [Just Enough] TARGET: Food Stalls or Canteen
|--|--|--> [Not Really] TARGET: DCS
|--|--|--> [Just Right] Free Time
|--|--|--|--> [Limited] Mode of Transportation
|--|--|--|--|--> [Private] TARGET: Food Stalls or Canteen
|--|--|--|--|--> [Walk] TARGET: Food Stalls or Canteen
|--|--|--|--|--> [Public] TARGET: Area 2 or SC
|--|--|--|--> [Super Free] Mode of Transportation
|--|--|--|--|--> [Private] TARGET: DCS
|--|--|--|--|--> [Walk] TARGET: Area 2 or SC
|--|--|--|--|--> [Public] TARGET: DCS
|--|--|--|--> [Just Enough] TARGET: DCS
|--|--> [Med] Free Time
|--|--|--> [Limited] TARGET: Food Stalls or Canteen
|--|--|--> [Super Free] TARGET: Maginhawa
|--|--|--> [Just Enough] Company
|--|--|--|--> [None] Mode of Transportation
|--|--|--|--|--> [Private] TARGET: Food Stalls or Canteen
|--|--|--|--|--> [Walk] TARGET: Food Stalls or Canteen
|--|--|--|--|--> [Public] TARGET: Area 2 or SC
|--|--|--|--> [Few] Mode of Transportation
|--|--|--|--|--> [Private] TARGET: Food Stalls or Canteen
|--|--|--|--|--> [Walk] Power to go far
|--|--|--|--|--|--> [Far] TARGET: DCS
|--|--|--|--|--|--> [Average] TARGET: New CASAA or Food Trucks
|--|--|--|--|--|--> [Near] TARGET: New CASAA or Food Trucks
|--|--|--|--|--> [Public] TARGET: Food Stalls or Canteen
|--|--|--|--> [Many] TARGET: Katip or Technohub
|--> [A bit far from DCS] Workload
|--|--> [Busy] TARGET: New CASAA or Food Trucks
|--|--> [Manageable] Free Time
|--|--|--> [Limited] TARGET: Maginhawa
|--|--|--> [Super Free] TARGET: Food Stalls or Canteen
|--|--|--> [Just Enough] TARGET: Food Stalls or Canteen
|--|--> [None] TARGET: Food Stalls or Canteen
|--> [Far from DCS] TARGET: Area 2 or SC


ENTRY #  1
TEST CASE : [ High  Limited  Private  Far  Busy  None  Very  Outside UP  Katip or
Technohub ]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Katip or Technohub

ENTRY #  2
TEST CASE : [ Low  Super Free  Walk  Far  Busy  None  Not Really  Outside UP  Food
Stalls or Canteen ]
```

CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Area 2 or SC

ENTRY # 5
TEST CASE : [Low Just Enough Public Average Busy Many Not Really Near or at DCS
DCS]
CONCLUSION: DCS
HYPOTHESIS: DCS

ENTRY # 9
TEST CASE : [Med Just Enough Public Average Manageable Few Just Right Near or
at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 14
TEST CASE : [Med Limited Walk Near Busy None Just Right A bit far from DCS
Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 15
TEST CASE : [Low Limited Walk Near Manageable Few Just Right Near or at DCS
DCS]
CONCLUSION: DCS
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 22
TEST CASE : [Low Just Enough Walk Near Busy Few Not Really Near or at DCS Food
Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: DCS

ENTRY # 25
TEST CASE : [Med Just Enough Public Far Busy Few Just Right A bit far from DCS
Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: New CASAA or Food Trucks

ENTRY # 26
TEST CASE : [Low Super Free Public Near Busy Few Very Far from DCS Food Stalls
or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Area 2 or SC

ENTRY # 27
TEST CASE : [Med Super Free Public Near Manageable Few Very Near or at DCS New
CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: Maginhawa

ENTRY # 28
TEST CASE : [High Super Free Public Far Manageable Few Just Right Outside UP
Katip or Technohub]

CONCLUSION: Katip or Technohub
HYPOTHESIS: Katip or Technohub

ENTRY # 32
TEST CASE : [Low Just Enough Walk Near Manageable Many Just Right Near or at DCS   DCS]
CONCLUSION: DCS
HYPOTHESIS: DCS

ENTRY # 35
TEST CASE : [Med Super Free Walk Near Manageable Few Not Really Near or at DCS   DCS]
CONCLUSION: DCS
HYPOTHESIS: Maginhawa

ENTRY # 39
TEST CASE : [High Just Enough Walk Far Manageable None Very Near or at DCS Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Katip or Technohub

ENTRY # 41
TEST CASE : [Med Super Free Public Far Manageable Few Just Right Near or at DCS Katip or Technohub]
CONCLUSION: Katip or Technohub
HYPOTHESIS: Maginhawa

ENTRY # 42
TEST CASE : [Med Limited Public Average Busy Few Just Right Far from DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Area 2 or SC

ENTRY # 43
TEST CASE : [Low Just Enough Public Average Manageable None Just Right Near or at DCS New CASAA or Food Trucks]
CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: DCS

ENTRY # 46
TEST CASE : [Med Just Enough Walk Near Busy None Just Right Near or at DCS Food Stalls or Canteen]
CONCLUSION: Food Stalls or Canteen
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 49
TEST CASE : [Med Just Enough Walk Far Manageable Many Just Right A bit far from DCS Area 2 or SC]
CONCLUSION: Area 2 or SC
HYPOTHESIS: Food Stalls or Canteen

ENTRY # 50
TEST CASE : [Med Limited Public Near Busy Many Just Right A bit far from DCS New CASAA or Food Trucks]

CONCLUSION: New CASAA or Food Trucks
HYPOTHESIS: New CASAA or Food Trucks

Accuracy: 45.00 %