**Week 4 Session 2 Lab**

**Decision Table testing**

**This lab should take you approx. 30 -50 minutes**

# OBJECTIVES

* Learn about decision tables
* Practice using decision tables

# Decision Table Testing:

“A Black-Box test design technique in which test cases are designed to execute the combinations of inputs and/or stimuli (causes) shown in a decision table. “

A decision table is a table showing combinations of inputs and/or stimuli (causes) with their associated outputs and/or actions (effects) which can be used to design test cases.

A decision table is an excellent tool to use in both testing and requirements management. Essentially it is **a structured exercise to formulate requirements when dealing with complex business rules**. Decision tables are used to model complicated logic. They can make it easy to see that all possible combinations of conditions have been considered and when conditions are missed, it is easy to see this.

<http://reqtest.com/requirements-blog/a-guide-to-using-decision-tables/>

## Business Rules

Business logic or rules are usually defined as a series of causes and associated effects.

For example: Once a life insurance policy has been raised, and the client has not asked for the policy to be rescinded, an authorized person may authorize the policy and collect the first premium.

Decision tables are a good way of documenting the various Boolean causes (yes or no) and the effects associated with each combination of those causes.

A two-step approach is adopted**, the first step** being to identify the causes (the **input conditions**) to be taken into account.

**The second step** is to inspect each combination of conditions and determine the associated effect or **action**.

The input conditions and system actions are most often stated in such a way that they can be either true or false (Boolean). For example, the light in a room is either on or off.

The decision table contains:

* The triggering conditions, often combinations of the true and false for all input combinations.
* The resulting actions for each combination of conditions.

The number of rules or columns in the decision table may be calculated by two to the power of n, where n is the number of conditions, hence:

* 2 conditions = 4 rules
* 3 conditions = 8 rules
* 4 conditions = 16 rules
* 5 conditions = 32 rules
* 6 conditions = 64 rules
* 7 conditions = 128 rules
* 8 conditions = 256 rules

That’s a lot of testing!

**Worked Example**

The business rules (requirements) list a number of conditions and associated actions:

* If it is raining then take an umbrella.
* If it is cold then wear a coat.
* If it is not raining or cold then wear your sunglasses.

The first step is to pinpoint the conditions that can have a simple true or false result:

* The first condition is - it is raining. This is a Boolean condition that requires either a true or false answer.
* The second condition is - it is cold. Again this is a Boolean condition that requires either a true or false answer.

There are no other conditions as the remaining requirements involve negative answers to the two identified conditions.

Hence the next step is to identify the actions:

* The first action is - take an umbrella. Again this is a Boolean action that is either true or false.
* The second action is - wear a coat. Again this is a Boolean action that is either true or false.
* The third action is - wear your sunglasses. Again this is a Boolean action that is either true or false.

Now we must identify which combination of conditions gives which combination of actions using a table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Business rules** | | | |
| **Conditions** | **1** | **2** | **3** | **4** |
| Raining | True | False |  |  |
| Cold | True | False |  |  |
| **Actions** |  |  |  |  |
| Umbrella | True | False |  |  |
| Coat | True | False |  |  |
| Sunglasses | False | True |  |  |

**Create a Decision Table for the following scenario:**

*All standard bus fares are a fixed charge of $4. Passengers under 15 travel half fare. Passengers over 65 travel free. Passengers travelling off-peak get a 25% discount. The off-peak discount is applied before any others.*

How many conditions can you identify? Circle them above.

How many actions can you identify? Underline them above.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Conditions*** | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* |
| ***Standard Pass*** | *True* | *False* | *False* | *True*  *offpeak* | *False* | *False* |  |  |
| ***Pass under 15*** | *False* | *True* | *False* | *False* | *True*  *offpeak* | *False* |  |  |
| ***Pass over 65*** | *False* | *False* | *True* | *False* | *False* | *True*  *offpeak* |  |  |
| ***Actions*** |  | | | | | | | |
| $4 | *$4* | *-* | *-* | *$4* | *-* | *-* |  |  |
| $2 | *-* | *$2* | *-* | *-* | *$2* | *-* |  |  |
| Free | *-* | *-* | *Free* | *-* | *-* | *Free* |  |  |
| 25% Discount | *-* | *-* | *-* | *15%* | *15%* | *15%* |  |  |
| Expected Result: | *$4* | *$2* | *Free* | *$4* | *$1.5* | *Free* |  |  |

Are there any conditions/tests that are not feasible? \_\_\_\_\_\_

Explain:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Create a Decision Table for the scenario in the brochure in the assignments section:**