

Decision Table Based Testing

Introduction

- Deal with a combination of input
- Different combinations of inputs results in different actions being taken
- Decision Table has four parts

Conditions	Condition entries
Actions	Actions Entries

Decision Table Example

Limited entry table: Condition entries restricted to binary

Extended entry table: Condition entries have more than two.

Conditions	Printer does not print	Y	Y	Y	Y	N	N	N	N
	A red light is flashing	Y	Y	N	N	Y	Y	N	N
	Printer is unrecognized	Y	N	Y	N	Y	N	Y	N
Actions	Check the power cable			X					
	Check the printer-computer cable	X		X					
	Ensure printer software is installed	X		X		X		X	
	Check/replace ink	X	X			X	X		
	Check for paper jam		X		X				

Steps in Forming Decision Table

- Identify the decision variables.
- Identify the possible values for each decision variable
- Form a table, list all variables and actions and enumerate the allowed combinations of each of the variables.
- Identify the cases when values assumed by a variable are immaterial for a given combination of other input variables. Represent such variables by don't care symbol.
- For each combination of decision variables, list out the expected result or action.

Generate the decision table for triangle problem

- **STEP 1:** identify the decision variables
 - C1: $a < b+c$
 - C2: $b < a+c$
 - C3: $c < a+b$
 - C4: $a=b?$
 - C5: $a=c?$
 - C6: $b=c?$

Generate the decision table for triangle problem

- **Step 2:** Identify the possible values for each decision variable
 - All are Conditional hence T or F

Generate the decision table for triangle problem

- **Step 3:** Form a table, list all variables and actions and enumerate the allowed combinations of each of the variables.

	rules																							
C1: a<b+c?	32F										32T													
C2: b<a+c?	16F					16T					16F					16T								
C3: c<a+b?	8F			8T			8F			8T			8F			8T			8F			8T		
C4: a=b?	4T	4F		4T	4F		4T	4F		4T	4F		4T	4F		4T	4F		4T	4F		4T	4F	
C5: a=c?	2	2																						
	F	T																						
C6: b=c?																							
A1:Equilateral																								
A2:Isosceles																								
A3: Scalene																								
A4: Not a Triangle																								

Generate the decision table for triangle problem

- **Step 4:** Identify the cases when values assumed by a variable are immaterial for a given combination of other input variables.

[illegible]

Generate the decision table for triangle problem

- **Step 5: Generate Test Cases**

Case ID	a	b	c	Expected Output
1	4	1	2	Not a Triangle
2	1	4	2	Not a Triangle
3	1	2	4	Not a Triangle
4	5	5	5	Equilateral
5	???	???	???	Impossible
6	???	???	???	Impossible
7	2	2	3	Isosceles
8	???	???	???	Impossible
9	2	3	2	Isosceles
10	3	2	2	Isosceles
11	3	4	5	Scalene

Next Date Function

- Step 1: Identify the decision variables: 3 variables – month, day, year
 - C1: month in?
 - C2: day in?
 - C3: year in?
- A1: Impossible date
- A2: Increment day
- A3: Reset day
- A4: Increment Month
- A5: Reset month
- A6: Increment year

Next Date Function

- Step 2: Identify the possible values for each variables
 - M1: {month has 30 days}
 - M2: {month has 31 days}
 - M3: {month is feb}
 - D1={ $1 \leq d \leq 28$ }
 - D2={ $d=29$ }
 - D3={ $d=30$ }
 - D4={ $d=31$ }
 - Y1={y is leap year}
 - Y2={y is common year}

Next Date Function

- Step 3: Form a table, list various decision variables, actions and enumerate all possible combinations of each variable

Rule	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
C1	M1	M1	M1	M1	M1	M1	M1	M1	M2	M2	M2	M2	M2	M2	M2	M2	M3	M3	M3	M3	M3	M3	M3	M3
C2	D1	D1	D2	D2	D3	D3	D4	D4	D1	D1	D2	D2	D3	D3	D4	D4	D1	D1	D2	D2	D3	D3	D4	D4
C3	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
A1							x	x												x	x	x	X	x
A2	x	x	x	x					x	x	x	x	x	x			x	?						
A3					x	X									X	x		?	x					
A4					x	x									?	?		?	x					
A5															?	?								
A6															?	?								

Next Date Function

- Step 4: Identify the cases when the values assumed by a variable (or set of variables) are immaterial for a given combination of other input variables. Represent such variables using don't care symbol.

C1:month in	M1	M1	M1	M1	M2	M2	M2	M2	M3	M3	M3	M3	M3	M3
C2: day in	D1	D2	D3	D4	D1	D2	D3	D4	D1	D1	D2	D2	D3	D4
C3: year in	-	-	-	-	-	-	-	-	Y1	Y2	Y1	Y2	-	-
A1:Impossible				x								x	x	x
A2:Inc day	x	x			x	x	x		X	?				
A3:Reset day			x					X		?	X			
A4: Increment month			x					?		?	x			
A5: Reset Month								?						
A6:Increment year								?						

Next Date Function

- The decision table produced above doesn't help us in the case where month in M2 and day in D4
 - M1: {month has 30 days}
 - M2: {month has 31 days}
 - M3: {month is February}
 - M4: {month is December}
 - D1={ $1 \leq d \leq 27$ }
 - D2={ $d=28$ }
 - D3={ $d=29$ }
 - D4={ $d=30$ }
 - D5={ $d=31$ }
 -
 - Y1={y is leap year}
 - Y2={y is common year}

Next Date Function

[illegible]

Example

- Assume your local baseball squadron offers free tickets to kids (<5) and discounted tickets (>65) to senior citizens. Free hats are given to all fans. (Note: If male then blue hat else pink hat)

Solution

c1 Age	age < 5	age < 5	age between 5 to 65	age between 5 to 65	age above 65	age above 65
C2 Gender	M	F	M	F	M	F
A1 Free Ticket	X	X				
A2 Discounted Ticket					X	X
A3 Normal Ticket			X	X		
A4 Blue Hat	X		X		X	
A5 Pink Hat		X		X		X

Test cases

id	age	gender	expected o/p
1	3	M	free ticket with blue hat
2	3	F	free ticket with pink hat
3	20	M	normal ticket with blue ha
4	20	F	normal ticket with pink hat
5	70	M	discounted ticket with blue hat
6	70	F	discounted ticket with pink hat

Example

Generate test cases using decision table to test transferring money online to an account which is already added and approved.