HW 03 - Decision Table and State Diagram

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SSW 567 - Software Testing & Quality Assurance

Professor Kempinski

Summary:

The assignment shown below was broken into two parts, each a unique question with its own data and proof. After the completion of the assignment, I have gained a solid knowledge of decision tables, state diagrams, and tabulating test cases. All of this can provide a better overview of a project or any individual pieces of a project.

Part 1:

"The retirement pension salary of a Michigan public school teacher is a percentage of the average of their last 3 years of teaching Normally, the number of years of teaching service is the percentage multiplier. To encourage senior teachers to retire early, the Michigan legislature enacted the following incentive in May of 2010:

Teachers must apply for the incentive before June 11, 2010. Teachers who are currently eligible to retire (age >= 63 years) shall have a multiplier of 1.6% on their salary up to, and including, $90,000, and 1.5% on compensation in excess of $90,000.   Teacher who meet the 80 total years of age plus years of teaching shall have a multiplier of 1.55% on their salary up to, and including, $90,000 and 1.5% on compensation in excess of $90,000.

Make a decision table to describe the retirement pension policy; be sure to consider the retirement eligibility criteria carefully. What are the compensation multiplier for a person who is currently 64 with 20 years of teaching whose salary is $95,000?"

Assumptions:

- Every teacher in consideration is eligible for retirement (above the age of 63)

- Every employee in question applied for incentive

Inputs

Applied for incentive: {Y, N}
Age above 80: {Y, N}
Salary $90,000+: {Y, N}

Outputs

Compensation Multiplier %: {1.5, 1.55, 1.6, # Yrs teaching}

Combinations: 2 * 2 * 2 = 8 **Combinations**

Inputs	Values	Combinations							
		1	2	3	4	5	6	7	8
Applied for Incentive	Y, N	Y	Y	Y	Y	N	N	N	N
Age above 80	Y, N	Y	Y	N	N	Y	Y	N	N
Salary above $90,000	Y, N	Y	N	Y	N	Y	N	Y	N

Results (%)		1	2	3	4	5	6	7	8
1.50		Y	Y	Y					
1.55		Y							
1.60				Y	Y				
# Yrs teaching						Y	Y	Y	Y

After eliminating scenarios that share the same outcome:

Inputs	Values	Combinations				
		1	2	3	4	5
Applied for Incentive	Y, N	Y	Y	Y	Y	N
Age above 80	Y, N	Y	Y	N	N	Y
Salary above $90,000	Y, N	Y	N	Y	N	Y

Results (%)		1	2	3	4	5
1.50		Y	Y	Y		
1.55		Y				
1.60				Y	Y	
# Yrs teaching						Y

Since two different compensation multipliers can apply to one salary, as stated in the problem statement, some combinations indicate two compensation multipliers. Otherwise, every result adheres to the restraints states by the assumptions above. Everything displayed in the table is consistent with what was expected before the creation of the table.

Part 2:

Create a complete set of test cases for the microwave oven state diagram (follow the link for the diagram).   You may assume that the only possible combinations of states and events are included in the state diagram. Be sure to cover all possibilities. Include your state table and test cases in your answer. How many tests are required to fully test the solution?

State Table:

	Full Power	Half Power	Timer	Number	Door Open	Door Closed	Start	Cancel	Timeout
Waiting	Full Power: Power = 600	Half Power: Power = 300							
Full Power		Half Power: Power = 300	Set Time: get number exit: set time						
Half Power	Full Power: set power = 600		Set Time: get number exit: set time						
Set Time				Set Time: get number exit: set time	Disabled: display 'Waiting'	Enabled: display 'Ready'			
Disabled						Enabled: display 'Ready'			
Enabled							Operation: operate oven		
Operation					Disabled: display 'Waiting'			Waiting: display time	Waiting: display time

Test Cases:

Test Case ID	Current State	Event	Action	Next State
T-001	Waiting	Full Power	do Set power = 600	Full Power
T-002	Waiting	Half Power	do Set power = 300	Half Power
T-003	Full Power	Half Power	do Set power = 300	Half Power
T-004	Full Power	Timer	do get number	Set Time
T-005	Half Power	Full Power	do Set Power = 600	Full Power
T-006	Half Power	Timer	do get number exit: set time	Set Time
T-007	Set Time	Number	do get number exit: set time	Set Time
T-008	Set Time	Door Open	do display 'Waiting'	Disabled
T-009	Set Time	Door Closed	do display 'Ready'	Enabled
T-010	Disabled	Door Closed	do display 'Ready'	Enabled
T-011	Enabled	Start		Enabled
T-012	Operation	Door Open	do display 'Waiting'	Disabled
T-013	Operation	Cancel	do display time	Waiting
T-014	Operation	Timeout	do display time	Waiting
T-015	Waiting	End	End	End

I pledge my honor that I have abided by the Stevens Honor System.

- Tarik Kdiry