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SSW 567

HW 03 - Decision Table and State Diagram

Description:

Part 1: Do Problem 8 on page 131 of Jorgensen's Software Testing. You must include a decision table as part of your submission. See the syllabus for a link to the online version of this book.

For your reference, I've included the problem here:

"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?"

Be sure to include your assumptions and complete decision table plus any reductions that simplify the table to reach your final answer.

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?

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Honor Pledge:

“I pledge on my honor that I have not given or received any unauthorized assistance on this assignment/examination. I further pledge that I have not copied any material from a book, article, the Internet, or any other source except where I have expressly cited the source.”

Things Learned:

- Learned to create Optimized Decision table and FSM
- Planning and Structuring testcases based on models

Assumptions made:

In the part 1 question statement: “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.” The “80 total years of age plus years of teaching” is assumed as Age > 80.

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Solution:

Part 1:

Inputs –

Inputs	Values
Age	<63, >=63, >80
Date < 11 June 2010	Y, N
Salary > $ 90,000	Y, N

Outputs – 1.5%, 1.55%, 1.6%

No of columns - 3*2*2 = 12

Decision Table:

Inputs												
Age	<63	<63	<63	<63	>=63	>=63	>=63	>=63	>80	>80	>80	>80
Date < 11 June 2010	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N
Salary > $90,000	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Outputs												
1.5%					X				X			
1.55%										X		
1.6%						X						
Not Eligible	X	X	X	X			X	X			X	X

Reduction Level 1:

Inputs							
Age	<63	>=63	>=63	>=63	>80	>80	>80
Date < 11 June 2010	-	Y	Y	N	Y	Y	N
Salary > $90,000	-	Y	N	-	Y	N	-
Outputs							
1.5%		X			X		
1.55%						X	
1.6%			X				
Not Eligible	X			X			X

Final Reduced Decision Table: Reduction Level 2:

Inputs						
Age	<63	>=63	>=63	>80	>80	<=64,>80
Date < 11 June 2010	-	Y	Y	Y	Y	N
Salary > $90,000	-	Y	N	Y	N	-
Outputs						
1.5%		X		X		
1.55%					X	
1.6%			X			
Not Eligible	X					X

What are the compensation multiplier for a person who is currently 64 with 20 years of teaching whose salary is $95,000?

- Based on the decision table, Age >=63 and Salary > $90,000 is compensation multiplier is 1.5%

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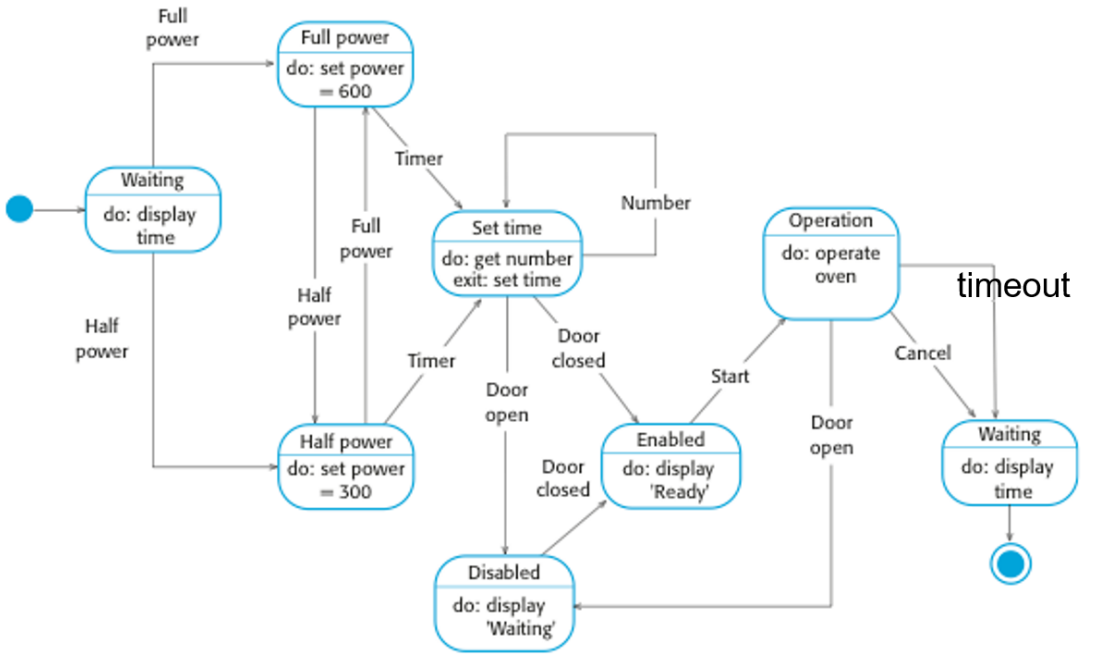
Part 2:



Number of Inputs: 9

Number of States: 7

Total Test Cases: 63

State Table:

States\Input	**Full Power**	**Half Power**	**Timer**	**Number**	**Door Open**	**Door Closed**	**Start**	**Cancel**	**Timeout**
Waiting	Full Power	Half Power							
Full Power		Half Power	Set Time						
Half Power	Full Power		Set Time						
Set Time				Set Time	Disabled	Enabled			
Disabled						Enabled			
Enabled							Operation		
Operation					Disabled			Waiting	Waiting

Test Cases:

Test Case id	**Current State**	**Input Status**	**Action**	**Next State**
T1001	Waiting	Full Power	do: set power = 600	Full Power
T1002	Waiting	Half Power	do: set power = 300	Half Power
T1003	Waiting	Timer	nothing	Waiting
T1004	Waiting	Number	nothing	Waiting
T1005	Waiting	Door Open	nothing	Waiting

T1006	Waiting	Door Closed	nothing	Waiting
T1007	Waiting	Start	nothing	Waiting
T1008	Waiting	Cancel	nothing	Waiting
T1009	Waiting	Timeout	nothing	Waiting
T1010	Full Power	Full Power	nothing	Waiting
T1011	Full Power	Half Power	do: set power = 300	Half Power
T1012	Full Power	Timer	do: get number, exit set time	Set Time
T1013	Full Power	Number	nothing	Full Power
T1014	Full Power	Door Open	nothing	Full Power
T1015	Full Power	Door Closed	nothing	Full Power
T1016	Full Power	Start	Error	Full Power?
T1017	Full Power	Cancel	Error	Waiting?
T1018	Full Power	Timeout	Error	Waiting?
T1019	Half Power	Full Power	do: set power = 600	Full Power
T1020	Half Power	Half Power	nothing	Half Power
T1021	Half Power	Timer	do: get number, exit set time	Set Time
T1022	Half Power	Number	nothing	Half Power
T1023	Half Power	Door Open	nothing	Half Power
T1024	Half Power	Door Closed	nothing	Half Power
T1025	Half Power	Start	Error	Half Power?
T1026	Half Power	Cancel	Error	Waiting?
T1027	Half Power	Timeout	Error	Waiting?
T1028	Set Time	Full Power	nothing	Set Time
T1029	Set Time	Half Power	nothing	Set Time
T1030	Set Time	Timer	nothing	Set Time
T1031	Set Time	Number	do: get number, exit set time	Set Time
T1032	Set Time	Door Open	do: display 'Waiting'	Disabled
T1033	Set Time	Door Closed	do: display 'Ready'	Enabled
T1034	Set Time	Start	Error	Set Time?
T1035	Set Time	Cancel	Error	Waiting?
T1036	Set Time	Timeout	Error	Waiting?
T1037	Enabled	Full Power	nothing	Enabled
T1038	Enabled	Half Power	nothing	Enabled
T1039	Enabled	Timer	Error	Set Time?
T1040	Enabled	Number	Error	Set Time?

T1041	Enabled	Door Open	Error	Disabled?
T1042	Enabled	Door Closed	nothing	Enabled
T1043	Enabled	Start	do: operate oven	Operation
T1044	Enabled	Cancel	Error	Waiting?
T1045	Enabled	Timeout	Error	Waiting?
T1046	Disabled	Full Power	nothing	Disabled
T1047	Disabled	Half Power	nothing	Disabled
T1048	Disabled	Timer	Error	Set Time?
T1049	Disabled	Number	Error	Set Time?
T1050	Disabled	Door Open	nothing	Disabled
T1051	Disabled	Door Closed	do: display 'Ready'	Enabled
T1052	Disabled	Start	Error	Disabled?
T1053	Disabled	Cancel	Error	Waiting?
T1054	Disabled	Timeout	Error	Waiting?
T1055	Operation	Full Power	nothing	Operation
T1056	Operation	Half Power	nothing	Operation
T1057	Operation	Timer	Error	Set Time?
T1058	Operation	Number	nothing	Operation
T1059	Operation	Door Open	do: display 'Waiting'	Disabled
T1060	Operation	Door Closed	nothing	Operation
T1061	Operation	Start	nothing	Operation
T1062	Operation	Cancel	do: display time	Waiting
T1063	Operation	Timeout	do: display time	Waiting