

HW 03 - Decision Table and State Diagram

1. Assignment Description:

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?"

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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3. Summary:

Part 1:

Decision Table:

Input	values	1	2	3	4	5	6
age ≥ 63 years	Y,N	Y	Y	Y	Y	Y	N
Before June 11, 2010	Y,N	Y	Y	Y	Y	N	-

<i>the 80 total years of age plus years of teaching</i>	Y,N	N	Y	N	Y	-	-
Salary	<=\$90k >\$90k	<=90K	>90K	>90K	<=90k	-	-
RESULTS							
Not eligible						Y	Y
1.5%			>90K	>90K			
1.55%			<=90k		Y		
1.6%		Y		<=90K			

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

Total year is $64 + 20 = 84$ years, so:

1.55% of the average of their last 3 years of teaching salary, up to a maximum of \$90,000

1.5% of any amount of their salary that exceeds \$90,000

Part 2:

State Tables:

States/Inputs	Command: Half	Command: Full	Set Time: Number
Waiting	Half Power	Full Power	
Half Power		Full Power	
Full Power	Half Power		
Set time			Set time

Set time state table

States/Inputs	Command: Door Open	Command: Door Closed	Command: Start	Command: Timeout	Command: Cancel
Set Time	Disabled	Enabled			
Enabled		Enabled	Operation		
Disabled					
Operation	Disabled			waiting	waiting

Test Cases:

Test Case ID	Current State	Power/Command	Action	Next State
T-101	waiting	Half Power	Do: set power =300	Half Power
T-102	waiting	Full Power	Do: set power = 600	Full Power
T-103	Full Power	Half Power	Do: set power =300	Half Power
T-104	Full Power	Timer	Do: get number, exit, set time	Set time
T-105	Set time	Number	Do: get number, exit, set time	Set time
T-106	Set time	Door open	Do: display 'waiting'	Disabled
T-107	Set time	Door closed	Do: display 'Ready'	Enabled
T-108	Set time	Start	Error	Set time??
T-109	Set time	Cancel	Error	Waiting??
T-110	Set time	Time out	Error	Waiting??
T-111	Half Power	Full Power	Do: Set power = 600	Full Power
T-112	Half Power	Timer	Do: get number, exit, set time	Set time
T-113	Enabled	Start	Do: operate oven	Operation
T-114	Enabled	Cancel	Error	Waiting??
T-115	Enabled	Time out	Error	Waiting??
T-116	Disabled	Door closed	Do: display 'Ready'	Enabled
T-117	Disabled	Cancel	Error	Waiting??
T-118	Disabled	Time out	Error	Waiting??
T-119	Operation	Cancel	Do: display time	Waiting
T-120	Operation	Timeout	Do: display time	Waiting
T-121	Operation	Door open	Do: display 'Waiting'	Disabled

4. Reflection: I learned how to draw decision table and how to draw state tables. But it is not that easy to totally understand state diagram though, it takes time.

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