HW-03 – Decision Table and State Diagram

Author: Syed Zain Raza

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.

Answer:

Retirement Pension Policy:

Inputs	**Values**		**Combinations**			
Age >=63	**(Y)**		Y	Y	Y	Y
Age + Teaching = 80	**(Y, N)**		Y	N	N	Y
Salary <= 90K	**(Y, N)**		Y	Y	N	N

Results						
Compensation Multiplier %			**1.5**	**1.6**	**1.5**	**1.55**

A person who is currently 64 years of age with 20 years of teaching and has a salary of $95K will have a compensation multiplier of **1.5%**

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?

Answer:

As there are 7 different states in the microwave oven state diagram and we can go to the final state through 9 ways so there will be in total 63 test cases.

Test Case 1:

Current State – Waiting

Status – Full Power

Action – do: set Power = 600

Next State – Full Power

Test Case 2:

Current State – Waiting

Status – Half Power

Action – do: set power = 300

Next State – Half Power

Test Case 3:

Current State – Waiting

Status – Timer

Action – nothing

Next State – Waiting

Test Case 4:

Current State – Waiting

Status – Number

Action – nothing

Next State – Waiting

Test Case 5:

Current State – Waiting

Status – Door Open

Action – nothing

Next State – Waiting

Test Case 6:

Current State – Waiting

Status – Door Closed

Action – nothing

Next State – Waiting

Test Case 7:

Current State – Waiting

Status – Start

Action – nothing

Next State – Waiting

Test Case 8:

Current State – Waiting

Status – Cancel

Action – nothing

Next State – Waiting

Test Case 9:

Current State – Waiting

Status – Timeout

Action – nothing

Next State – Waiting

Test Case 10:

Current State – Full Power

Status – Full Power

Action – nothing

Next State – Full Power

Test Case 11:

Current State – Full Power

Status – Half Power

Action – do: set Power = 300

Next State – Half Power

Test Case 12:

Current State – Full Power

Status – Timer

Action – do: get number, exit: set time

Next State – Set Time

Test Case 13:

Current State – Full Power

Status – Number

Action – nothing

Next State – Full Power

Test Case 14:

Current State – Full Power

Status – Door Open

Action – nothing

Next State – Full Power

Test Case 15:

Current State – Full Power

Status – Door Closed

Action – nothing

Next State – Full Power

Test Case 16:

Current State – Full Power

Status – Start

Action – Error

Next State – Full Power

Test Case 17:

Current State – Full Power

Status – Cancel

Action – Error

Next State – Full Power

Test Case 18:

Current State – Full Power

Status – Timeout

Action – Error

Next State – Full Power

Test Case 19:

Current State – Half Power

Status – Full Power

Action – do: set Power = 600

Next State – Full Power

Test Case 20:

Current State – Half Power

Status – Half Power

Action – nothing

Next State – Half Power

Test Case 21:

Current State – Half Power

Status – Timer

Action – do: get number, exit: set time

Next State – Set Time

Test Case 22:

Current State – Half Power

Status – Number

Action – nothing

Next State – Half Power

Test Case 23:

Current State – Half Power

Status – Door Open

Action – nothing

Next State – Half Power

Test Case 24:

Current State – Half Power

Status – Door Closed

Action – nothing

Next State – Half Power

Test Case 25:

Current State – Half Power

Status – Start

Action – Error

Next State – Half Power

Test Case 26:

Current State – Half Power

Status – Cancel

Action – Error

Next State – Half Power

Test Case 27:

Current State – Half Power

Status – Timeout

Action – Error

Next State – Half Power

Test Case 28:

Current State – Set Time

Status – Full Power

Action – nothing

Next State – Set Time

Test Case 29:

Current State – Set Time

Status – Half Power

Action – nothing

Next State – Set Time

Test Case 30:

Current State – Set Time

Status – Timer

Action – nothing

Next State – Set Time

Test Case 31:

Current State – Set Time

Status – Number

Action – do: get number, exit: set time

Next State – Set Time

Test Case 32:

Current State – Set Time

Status – Door Open

Action – do: display Waiting

Next State – Disabled

Test Case 33:

Current State – Set Time

Status – Door Closed

Action – do: display Ready

Next State – Enabled

Test Case 34:

Current State – Set Time

Status – Start

Action – nothing

Next State – Set Time

Test Case 35:

Current State – Set Time

Status – Cancel

Action – nothing

Next State – Set Time

Test Case 36:

Current State – Set Time

Status – Timeout

Action – nothing

Next State – Set Time

Test Case 37:

Current State – Enabled

Status – Full Power

Action – nothing

Next State – Enabled

Test Case 38:

Current State – Enabled

Status – Half Power

Action – nothing

Next State – Enabled

Test Case 39:

Current State – Enabled

Status – Timer

Action – Error

Next State – Enabled

Test Case 40:

Current State – Enabled

Status – Number

Action – Error

Next State – Enabled

Test Case 41:

Current State – Enabled

Status – Door Open

Action – Error

Next State – Enabled

Test Case 42:

Current State – Enabled

Status – Door Closed

Action – nothing

Next State – Enabled

Test Case 43:

Current State – Enabled

Status – Start

Action – do: operate oven

Next State – Operation

Test Case 44:

Current State – Enabled

Status – Cancel

Action – nothing

Next State – Enabled

Test Case 45:

Current State – Enabled

Status – Timeout

Action – nothing

Next State – Enabled

Test Case 46:

Current State – Disabled

Status – Full Power

Action – nothing

Next State – Disabled

Test Case 47:

Current State – Disabled

Status – Half Power

Action – nothing

Next State – Disabled

Test Case 48:

Current State – Disabled

Status – Timer

Action – Error

Next State – Disabled

Test Case 49:

Current State – Disabled

Status – Number

Action – Error

Next State – Disabled

Test Case 50:

Current State – Disabled

Status – Door Open

Action – nothing

Next State – Disabled

Test Case 51:

Current State – Disabled

Status – Door Closed

Action – do: display Ready

Next State – Enabled

Test Case 52:

Current State – Disabled

Status – Start

Action – nothing

Next State – Disbaled

Test Case 53:

Current State – Disabled

Status – Cancel

Action – Error

Next State – Disabled

Test Case 54:

Current State – Disabled

Status – Timeout

Action – Error

Next State – Disabled

Test Case 55:

Current State – Operation

Status – Full Power

Action – nothing

Next State – Operation

Test Case 56:

Current State – Operation

Status – Half Power

Action – nothing

Next State – Operation

Test Case 57:

Current State – Operation

Status – Timer

Action – nothing

Next State – Opeartion

Test Case 58:

Current State – Operation

Status – Number

Action – nothing

Next State – Operation

Test Case 59:

Current State – Operation

Status – Door Open

Action – do: display Warning

Next State – Disabled

Test Case 60:

Current State – Operation

Status – Door Closed

Action – nothing

Next State – Operation

Test Case 61:

Current State – Operation

Status – Start

Action – nothing

Next State – Operation

Test Case 62:

Current State – Operation

Status – Cancel

Action – do: display time

Next State – Waiting

Test Case 63:

Current State – Operation

Status – Cancel

Action – do: display time

Next State – Waiting

These are all the 63 test cases that can be written from the state diagram.

Reflections:

In this assignment I went into depth of how to make decision tables. For the second part I also read a lot of material online about how to write test cases from a given state diagram. This assignment was fun and I really enjoyed doing it.

Honor Pledge:

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