

Software Testing, Quality Assurance and
Maintenance (SSW 567)

Homework 3

Prof. Andre Bondi

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Assignment 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.

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

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Summary:

Make a decision table to describe the retirement pension policy; be sure to consider the retirement eligibility criteria carefully

Part 1:

Decision Table:

Input	Values	1	2	3	4	5	6
Age >= 63	Y, N	Y	Y	Y	Y	N	N
Before June 11 2010	Y, N	Y	Y	Y	N	Y	N
SALARY > 90K	Y, N	Y	N	N	-	-	-
TOTAL AGE >= 80	Y, N	-	Y	N	-	-	-
RESULTS							
1.5%	Y, N	X					
1.55%	Y, N		X				
1.6%	Y, N			X			
NOT ELIGIBLE	Y, N				X	X	X

Input	Values	1	2	3	4	5
Age >= 63	Y, N	Y	Y	Y	Y	N
Before June 11 2010	Y, N	Y	Y	Y	N	-
SALARY > 90K	Y, N	Y	N	N	-	-
TOTAL AGE >= 80	Y, N	-	Y	N	-	-
RESULTS						
1.5%	Y, N	X				
1.55%	Y, N		X			
1.6%	Y, N			X		
NOT ELIGIBLE	Y, N				X	X

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

Salary = 75,000 (given)

no. of years of teaching = 20

$$\text{upto } 70,000 \$ = 1.6\% \times 20 \text{ years} \\ = 32\%$$

$$\text{on balance } 5,000 \$ = 20 \times 1.5\% \\ = 30\%$$

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?

Part 2: State Tables:

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			
Enabled							Operation		
Disabled						Enabled			
Operation					Disabled			Waiting	Waiting

Test Cases:

Test Case ID	Current State	Power/Input/Status	Action	Next State
T-100	Waiting	Full Power	Do: set power = 600	Full Power
T-101	Waiting	Half power	Do; set power = 300	Half power
T-102	Waiting	Timer	Nothing	Waiting
T-103	Waiting	Number	Nothing	Waiting
T-104	Waiting	Door open	Nothing	Waiting
T-105	Waiting	Door closed	Nothing	Waiting
T-106	Waiting	Start	Nothing	Waiting
T-108	Waiting	Cancel	Nothing	Waiting
T-109	Full power	Full power	Nothing	Full power
T-110	Full power	Half power	Nothing	Half power
T-111	Full power	Timer	Do; get number, exit set timer	Set timer
T-112	Full power	Number	Nothing	Full power
T-113	Full power	Door open	Nothing	Full power
T-114	Full power	Door closed	Nothing	Full power
T-115	Full power	Start	Error	Full Power?
T-116	Full power	Cancel	Error	Waiting?
T-117	Full power	Time out	Error	Waiting?
T-118	Half power	Full power	Do; set power = 600	Full power
T-119	Half power	Half power	Nothing	Half power
T-120	Half power	Timer	Do; get number, exit set timer	Set timer

T-121	Half power	Number	Nothing	Half power
T-122	Half Power	Door open	Nothing	Half power
T-123	Half power	Door closed	Nothing	Half power
T-124	Half power	Start	Error	Half power
T-125	Half power	Cancel	Error	Waiting?
T-126	Half Power	Timeout	Error	Waiting?
T-127	Set Time	Full power	Nothing	Set Time
T-128	Set time	Half power	Nothing	Set time
T-129	Set time	Timer	Nothing	Set time
T-130	Set time	Number	Do; get number, exit set time	Set time
T-131	Set time	Door open	Do; display 'waiting'	Disabled
T-132	Set time	Door closed	Do; display 'ready'	Enabled
T-133	Set time	Start	Error	Set time?
T-134	Set time	Cancel	Error	Waiting?
T-135	Set time	Time out	Error	Waiting?
T-136	Enabled	Full power	Nothing	Enabled
T-137	Enabled	Half power	Nothing	Enabled
T-138	Enabled	Timer	Error	Set time?
T-139	Enabled	Number	Error	Set time?
T-140	Enabled	Door open	Error	Set time?
T-141	Enabled	Door closed	Nothing	Enabled
T-142	Enabled	Start	Do; operate oven	Operation
T-143	Enabled	Cancel	Error	Waiting?
T-144	Enabled	Time out	Error	Waiting?
T-145	Disabled	Full power	Nothing	Disabled
T-146	Disabled	Half power	Nothing	Disabled
T-147	Disabled	Timer	Error	Set time?
T-148	Disabled	Number	Error	Set time?
T-149	Disabled	Door open	Nothing	Disabled
T-150	Disabled	Door closed	Do; display 'Ready'	Enabled

T-151	Disabled	Start	Nothing	Disabled
T-152	Disabled	Cancel	Error	Waiting?
T-153	Disabled	Time out	Error	Waiting?
T-154	Operation	Full power	Nothing	Operation
T-155	Operation	Half power	Nothing	Operation
T-156	Operation	Timer	Nothing	Operation
T-157	Operation	Number	Nothing	Operation
T-158	Operation	Door open	Do; display 'waring'	Disabled
T-159	Operation	Door closed	Nothing	Operation
T-160	Operation	Start	Nothing	Operation
T-161	Operation	Cancel	Do; display time	Waiting
T-162	Operation	Time out	Do; display time	waiting

Reflection: I learnt how to utilize decision tables and compute the best number of test cases needed for a product. These are intriguing and enjoyable activities.

Honor Pledge: I pledge my honor that I have abided by the stevens honor system