White Box Test Techniques - Answers

1	Statement Coverage	3	Branch Coverage	3
2	Statement Coverage	1	Branch Coverage	3
3	Statement Coverage	2	Branch Coverage	4
4	Statement Coverage	2	Branch Coverage	2
5	Statement Coverage	1	Branch Coverage	2
6	Statement Coverage	1	Branch Coverage	2

Black-Box Test Techniques - Answers

Question 1

To be eligible for a mortgage you must be between the ages of 18 and 64 (inclusive). The age input field will only accept two digits and will not accept minus figures ("-"). What are the valid and invalid values for Equivalence Partitioning and Boundary Value Analysis?

Answer
Mortgage Ages

Equivalence Partitioning

Classification	Invalid	Valid	Invalid
Partition	Up to 17	18 – 64	65 – 100
Value	9	42	82
Expected Result	Rejected	Accepted	Rejected

Boundary Value Analysis

Classification	I	V	V	V	V	I
Boundary	18			64		
Value	17	18	19	63	64	65
Exp. Result	R	A	A	A	A	R

Question 2

An input field on a mortgage calculator requires a value between 15,000 and 2,000,000. The field only allows numerical values to be entered and has a maximum length of 9 digits. What are the valid and invalid values for Equivalence Partitioning and Boundary Value Analysis?

Answer
Mortgage Value

Equivalence Partitioning

Classification	Invalid	Valid	Invalid
Partition	Up to 15,000	15,000 – 2,000,000	2,000,000 – 999,999,999
Value	7,500	1,007,500	500,100,000

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Expected Result	Rejected	Accepted	Rejected

Boundary Value Analysis

Classification	I	V	V	V	V	I
Boundary	15,000			2,000,000		
Value	14,999	15,000	15,001	1,999,999	2,000,000	2,000,001
Exp. Result	R	A	A	A	A	R

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Question 3

The term of a mortgage can be between 5 and 30 years, identify the valid values for Equivalence Partitioning and Boundary Value Analysis?

Answer
Mortgage Term

Equivalence Partitioning

Classification	Valid
Partition	5 – 30
Value	17
Expected Result	Accepted

Boundary Value Analysis

Classification	V	V	V	V
Boundary	5		30	
Value	5	6	29	30
Exp. Result	A	A	A	A

Question 4

The font formatting box in a word processing package allows the user to select the size of the font – ranging from 6 point to 72 point (in 0.5 steps).

What are the valid and invalid values for Equivalence Partitioning and Boundary Value Analysis?

Answer
Font Size

Equivalence Partitioning

Classification	Invalid	Valid	Invalid
Partition	Up to 5.5	6 – 72	72.5 – ∞
Value	3	39	92
Expected Result	Rejected	Accepted	Rejected

Boundary Value Analysis

Classification	I	V	V	V	V	I
Boundary	6			72		
Value	5.5	6	6.5	71.5	72	72.5
Exp. Result	R	A	A	A	A	R

Question 5

A screen for entering mortgage applications requires information on both peoples wages and will generate the maximum amount available for the mortgage (based on 3¼ times larger wage, 1¼ times lower wage). If the mortgage is less than £250,000 then the interest rate is 4.5%, if the amount is £250,000 to £1,000,000 then the interest rate is 4%.

What are the valid and invalid values for Equivalence Partitioning and Boundary Value Analysis necessary to test the output (i.e. the interest rate)?

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Answer
Mortgage Application

Equivalence Partitioning

Classification	Invalid	Valid	Valid	Invalid
Partition	Up to 0	1 – 250,000	250,000 – 1,000,000	1,000,001 and above
Value	-5	125,000	625,000	2,000,000
Expected Result	Rejected	Accepted (4.5%)	Accepted (4%)	Rejected

Boundary Value Analysis

Classification	I	V	V
Boundary		1	
Value	0	1	2
Exp. Result	Rejected (Error)	Accepted (4.5%)	Accepted (4.5%)

Classification	V	V	I
Boundary		250,000	
Value	249,999	250,000	250,001
Exp. Result	Accepted (4.5%)	Accepted (4.5%)	Rejected (4%)

Classification	I	V	V
Boundary		250,001	
Value	250,000	250,001	250,002
Exp. Result	Rejected (4.5%)	Accepted (4%)	Accepted (4%)

Classification	V	V	I
Boundary		1,000,000	
Value	999,999	1,000,000	1,000,001
Exp. Result	Accepted (4%)	Accepted (4%)	Rejected (Error)

Question 6

Personal loan of between £1000 to £25000. For loans between £1,000 and £10,000 there is an interest rate of 8.5%, loans between £10,001 and £25,000 have an interest rate of 8%.

What are the valid and invalid values for Equivalence Partitioning and Boundary Value Analysis?

Answer
Loan Interest Rates

Equivalence Partitioning

Classification	Invalid	Valid	Valid	Invalid
Partition	Up to 999	1,000 – 10,000	10,001 – 25,000	25,000+
Value	500	5,500	17,500	50,000
Expected Result	Rejected	Accepted	Accepted	Rejected

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	(Error)	(8.5)	(8%)	(Error)

Boundary Value Analysis

Classification	I	V	V
Boundary		1,000	
Value	999	1,000	1,001
Exp. Result	Rejected (Error)	Accepted (8.5%)	Accepted (8.5%)

Classification	V	V	I
Boundary		10,000	
Value	9,999	10,000	10,001
Exp. Result	Accepted (8.5%)	Accepted (8.5%)	Rejected (8%)

Classification	I	V	V
Boundary		10,001	
Value	10,000	10,001	10,002
Exp. Result	Rejected (8.5%)	Accepted (8%)	Accepted (8%)

Classification	V	V	I
Boundary		25,000	
Value	24,999	25,000	25,001
Exp. Result	Accepted (8%)	Accepted (8%)	Rejected (Error)

Question 7

A grading system takes student marks (coursework 0 – 75 and exam 0 – 25) and generates a grade based on those marks (0 – 40 Fail, 41 – 60 C, 61 – 80 B and 81 – 100 A).

Identify the valid and invalid values for Equivalence Partitioning and Boundary Value Analysis necessary to test the output (i.e. the grade)?

Answer

Equivalence Partitioning

Exam Mark	-1	5	10	15	20	30
Coursework	-1	15	40	55	70	90
Total Mark	-2	20	50	70	90	120
Partition	Total<0	0 – 40	41 – 60	61 – 80	81 – 100	100+
Exp. Output	Error	F	C	B	A	Error
Classification	I	V	V	V	V	I

Boundary Value Analysis

Exam Mark	-1	0	1	9	10	11	10	11	12	9	10	11
Coursework	0	0	0	30	30	30	30	30	30	50	50	50
Total Mark	-1	0	1	39	40	41	40	41	42	59	60	61
Boundary	0			40			41			60		
Exp. Output	Error	F	F	F	F	C	F	C	C	C	C	B
Classification	I	V	V	V	V	V	V	V	V	V	V	V

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Exam Mark	10	11	12	19	20	21	20	21	22	24	25	26
Coursework	50	50	50	60	60	60	60	60	60	75	75	75
Total Mark	60	61	62	79	80	81	80	81	82	99	100	101
Boundary		61			80			81			100	
Exp. Output	C	B	B	B	B	A	B	A	A	A	A	Error
Classification	V	V	V	V	V	V	V	V	V	V	V	I

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