

DOMAIN TESTING

USE CASE EQUIVALANCE ANALYSIS

Main Scenario

1. The teller enters the customer's account number
2. The system displays the customer's account details
3. The teller enters the withdrawal amount
4. The system subtracts the amount to be withdrawn from the customer's account balance
5. The system prints a transaction receipt

Alternate scenarios

- A) The customer's account details cannot be found at step 2
 - A1) The system displays the message **"Account not found"** and allows the teller to re-enter the account code
- B) The withdrawal amount > the customer's account balance at step 3
 - B1) The system displays the message "Insufficient Funds" and allows the teller to change the amount
 - B2) The use case resumes at step 4

Alternate scenarios (cont)

- C) The withdrawal amount $>$ the customer's account balance + customer's credit limit at step 3
 - C1) The system displays the message "Insufficient Funds" and allows the teller to change the amount
 - C2) The use case resumes at step 4

Supplementary Requirements

- ❑ When any input value falls outside its expected range the message “Invalid Input” will be displayed.
- ❑ If the account is overdrawn (negative balance), the system will display the customer’s account balance in red.
- ❑ The system can handle two decimal places

Look for ?

- ☐ Describe
 - the inputs to the program
 - The outputs
- ☐ Equivalence analysis
- ☐ Design TestCase

Solution

- The specification describes three inputs to the program:
 - Account balance
 - Withdrawal amount
 - Account credit limit
- The output are:
 - Updated account balance
 - 'Insufficient Funds' message
 - 'Invalid Input' message

Equivalence Partitions

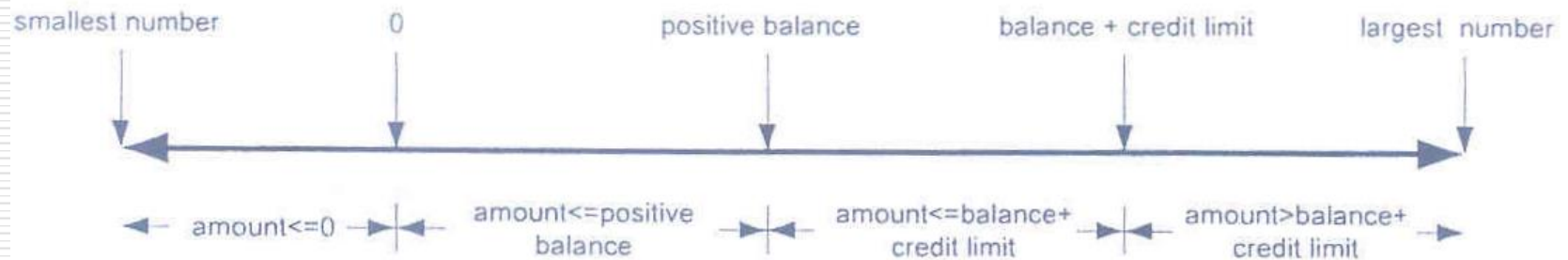


Figure 6: Equivalence Partitions for Withdrawal Amount

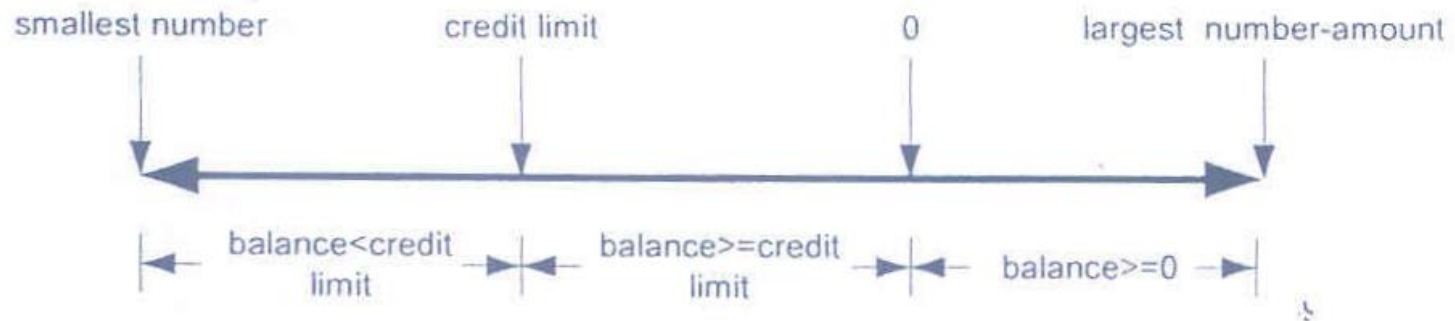


Figure 7: Output Equivalence Partitions for Account Balance



Complete Set of Partitions

Partition	Value	Lower Boundary	Upper Boundary
1	input balance	\geq smallest number	<0
2		≥ 0	\leq largest number
3		alphabetic string	
4		three decimal places	
5	credit limit	\geq smallest number	≤ 0
6		>0	\leq largest number
7		alphabetic string	
8		three decimal places	
9	Amount	\geq smallest number	≤ 0
10		>0	\leq positive balance
11		$>$ positive balance	\leq balance+credit limit
12		$>$ balance+credit limit	\leq largest number
13		alphabetic string	
14		three decimal places	
15	output balance	\geq smallest number	$<$ credit limit
16		\geq credit limit	<0
17		≥ 0	\leq largest number – amount
18	balance increased		
19	unable to withdraw		
20	'Insufficient Funds'		
21	'Invalid Input'		

Table 3: Complete Set of Partitions for Account Withdrawals

Test Cases Providing Coverage of Partitions

Partition Tested	Input			Expected Output
	Balance	Credit Limit	Amount	
1	-1000.10	+3000.00	+500.05	-1500.15
2	+1000.10	+3000.00	+500.05	+500.05
3	'a'	+3000.00	+500.05	'Invalid Input'
4	+1000.105	+3000.00	+500.05	'Invalid input'
5	+1000.10	-2000.00	+500.05	'Invalid Input'
6	-1000.10	+3000.00	+500.05	-1500.15
7	-1000.10	'a'	+500.05	'Invalid Input'
8	-1000.10	+3000.005	+500.05	'Invalid Input'
9	+1000.10	+3000.00	-500.05	'Invalid Input'
10	+1000.10	+3000.00	+500.05	500.05
11	+1000.10	+3000.00	+2000.05	-999.95
12	+1000.10	+3000.00	+5000.05	'Insufficient' Funds'
13	+1000.10	+3000.00	'a'	'Invalid Input'
14	+1000.10	+3000.00	+500.055	'Invalid Input'
15	+1000.10	+3000.00	+5000.05	'Insufficient'
16	-1000.10	+3000.00	+500.05	-1500.15
17	+1000.10	+3000.00	+500.05	+500.05
18	+1000.10	+3000.00	-500.05	'Invalid Input'
19	+1000.10	-2000.00	+500.05	'Invalid Input'
20	+1000.10	+3000.00	+5000.05	'Insufficient Funds'
21	+1000.10	+3000.00	-500.05	'Invalid Input'

Table 4: Test Cases Providing Coverage of Partitions

Minimum Set of Test Cases

Test Case	Partition Tested	Input			Expected Output
		Balance	Credit Limit	Amount	
1	1,6,16	-1000.10	+3000.00	+500.05	-1500.15
2	2,10,17	+1000.10	+3000.00	+500.05	+500.05
3	3	'a'	+3000.00	+500.05	'Invalid Input'
4	4	1000.105	+3000.00	+500.05	'Invalid input'
5	5,19	+1000.10	-2000.00	+500.05	'Invalid Input'
6	7	-1000.10	'a'	+500.05	'Invalid Input'
7	8	-1000.10	+3000.005	+500.05	'Invalid Input'
8	9,18,21	+1000.10	+3000.00	-500.05	'Invalid Input'
9	11	+1000.10	+3000.00	+2000.05	-999.95
10	12,15,20	+1000.10	+3000.00	+5000.05	'Insufficient'
11	13	+1000.10	+3000.00	'a'	'Invalid Input'
12	14	+1000.10	+3000.00	+500.055	'Invalid Input'

Table 5: Minimum Set of Test Cases

Boundary Value Test Cases

Partition Tested	Input			Expected Output
	Balance	Credit Limit	Amount	
9	+1000.10	+3000.00	-100,000,000.01	'Invalid Input'
9	+1000.10	+3000.00	-100,000,000.00	'Invalid Input'
9	+1000.10	+3000.00	-99,999,999.99	'Invalid Input'
9/10	+1000.10	+3000.00	-.01	'Invalid Input'
9/10	+1000.10	+3000.00	0	'Invalid Input'
9/10	+1000.10	+3000.00	+.01	+1000.09
10/11	+1000.10	+3000.00	+1000.09	0.01
10/11	+1000.10	+3000.00	+1000.10	0.00
10/11	+1000.10	+3000.00	+1000.11	-0.01
11	+1000.10	+3000.00	+4000.09	+2999.99
11	+1000.10	+3000.00	+4000.10	-3000
11	+1000.10	+3000.00	+4000.11	Insufficient Funds

Table 6: Boundary Value Test Cases