Date: 24 Jun 2020

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Q2

Assumption: Card is valid unless explicitly mentioned so i.e. in the use case description, card is valid in first 4 points.

The number of test cases would be 6.

	Rules					
Conditions	1	2	3	4	5	6
Valid pin entered ?	N	Y	Y	Y	-	-
Bank online ?	-	N	Y	Y	Y	N
Account open ?	-	-	N	Y	-	-
Card valid?	Y	Y	Y	Y	N	N
Actions	**1**	**2**	**3**	**4**	**5**	**6**
System displays 'Re-enter pin'	1					
System displays 'Try later'		1				

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System displays 'Account closed, call your branch'			1			
System opens ~~and displays~~ Screen 2 and displays 'Select a service'				1		
System displays 'card is revoked'					1	
System displays 'invalid card'						1
System ejects the card		2	2			2
System retains the card					2	

Test cases on next page.

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Test case ID	Test case purpose	Input				Expected outcome
		Pin	Account	Bank	Card	
1	To test invalid pin	Invalid pin entered	Open	Online	Valid	System displays 'Re-enter pin'
2	To test bank being offline	Valid 4 digit pin entered	Open	Offline	Valid	System displays 'Try later' and ejects card
3	To test bank closed	//	Closed	Online	Valid	System displays 'Account closed, call*'
4	To test all valid options	//	Open	Online	Valid	System opens Screen 2** and
5	To test ~~when~~ invalid card when bank is online	Valid 4 digit pin entered	Open	Online	Invalid	System displays 'card is revoked' and retains card.
6	To test invalid card when bank is offline	Valid 4 digit pin entered	Open	Offline	Invalid	System displays 'invalid card' and ejects card

* your branch!' and ejects card

** displays 'Select a service'

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Q3

Time (Day)	SLOC	Faults	Failures	Failures/KLOC
1	1705	64	5	2.93
2	1798	68	6	3.34
3	1776	98	11	6.19
4	1843	80	15	8.14
5	1925	68	13	6.75
6	1890	47	9	4.76
7	1875	52	17	9.07
8	2000	42	12	6
9	2080	57	6	2.88
10	2000	54	8	4.00

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KLOC is calculated by dividing SLOC by 1000.

Average of failures/KLOC = $\mu = \frac{(2.93 + 3.34 + \ldots + 4)}{10}$

$= 5.41$

Std dev of failures/KLOC = stdev = $\sqrt{\frac{\Sigma (x_i - \mu)^2}{N}}$

$= \sqrt{\frac{(2.93-5.41)^2 + \ldots + (4-5.41)^2}{10}}$

$= \sqrt{4.28}$

$= 2.07$

$UCL = \mu + 3\sqrt{stdev}$

$= 5.41 + 3\sqrt{2.07}$

$= 5.41 + 4.31$

$= 9.72$

$LCL = \mu - 3\sqrt{stdev}$

$= 5.41 - 4.31$

$= 1.1$

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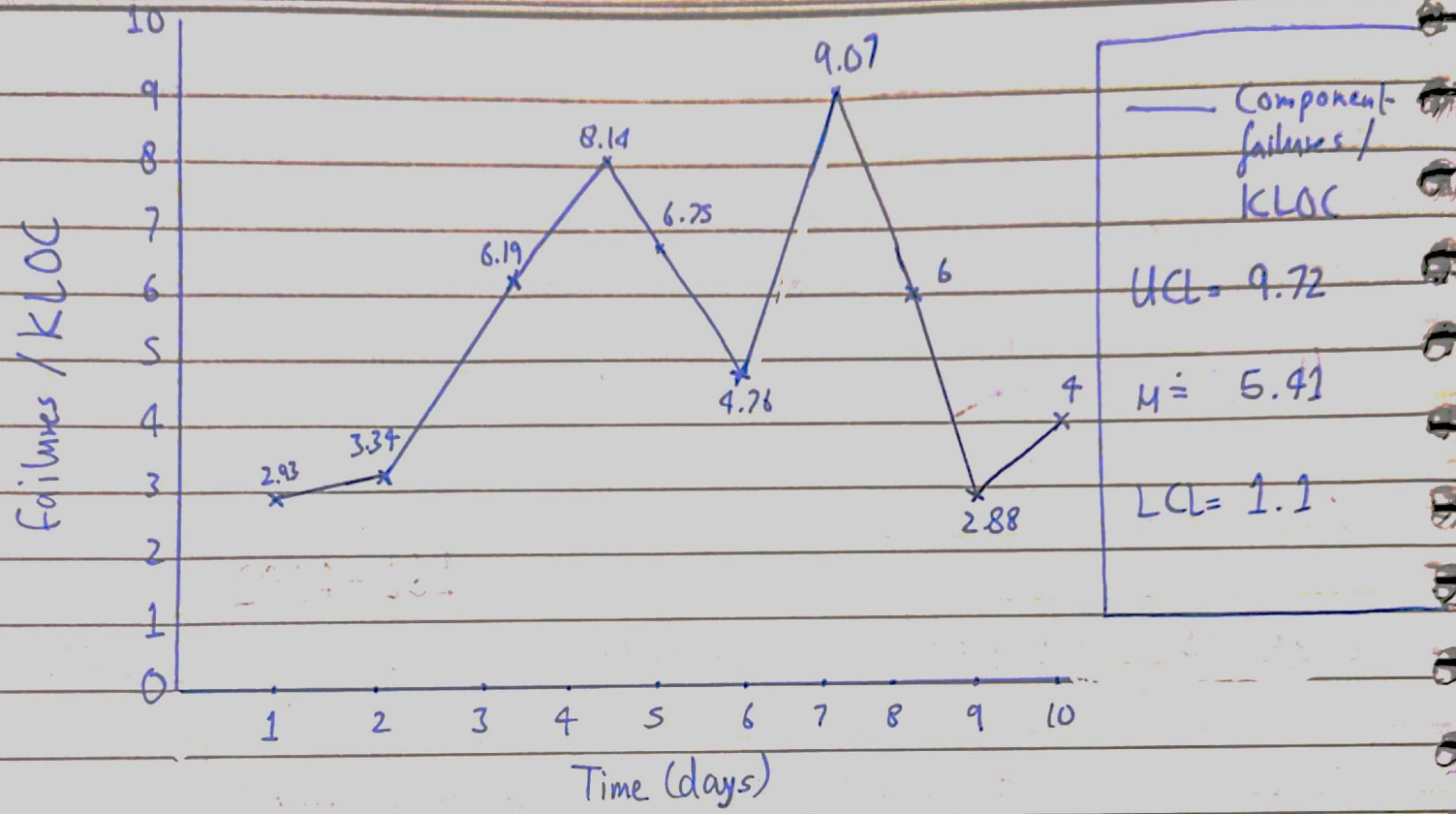

All points are below UCL and above LCL so the process under study is stable. There is no need of recalculations and further testing is not required. The calculations based on first set of points are not conditional and process is under control.

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Q1

The techniques that are applicable in this scenario are ~~decision tables~~ use case and state transition diagrams. We have chosen state transition technique because:

- Application under test is a real-time system with different states and transitions encompassed
- Application is dependent on events/values/conditions of the past.
- Sequence of events need to be tested.
- Easy to verify if all conditions are covered
- System has a finite set of values. (for infinite, BVA and ECP is used)

Source: softwaretestinghelp.com