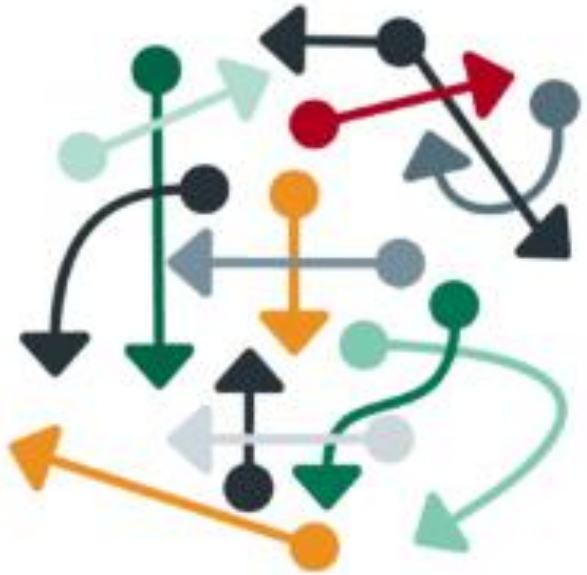

Test Design Techniques

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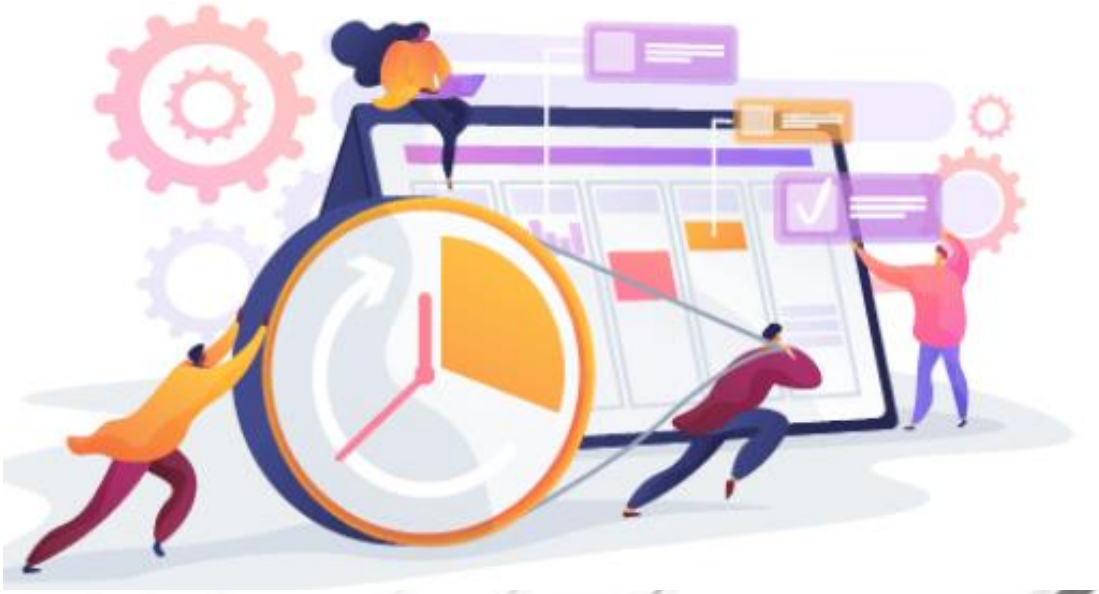
Agenda:

1.Equivalence partitioning
Boundary values analysis
2.Decision table
3.State transition diagram



1. Equivalence partitioning and Boundary value analysis

To **calculate** the electricity cost user should **enter** an **old and** a **new values** of electricity counter and press "Calc" button. It works only if values are entered correctly:

- **contain only digits**;
- **no longer than 6 digits**;
- **new value is not less than an old one**.

1. Build equivalence classes (partitions) based on given information
2. Stand Out boundary values

	Contain only digits			No longer than 6 digits			New value is not less than an old value		Calculate the electricity cost user		
	1	2	3	4	5	6	7	8	9	10	11
	VALID	INVALID	INVALID	VALID	INVALID	INVALID	VALID	INVALID	VALID	INVALID	INVALID
Class	Digits 0-9	Letters A-Z, a-z	Special characters "#$%^&", etc	1⩽Value ⩽6	HDN≠0	Value>6	NV⩾OV	NV<OV	NV and OV≠Ø	NV or OV=Ø	NV and OV=Ø
EP	9205	256D 256g	3894* -1258	1234	0 05	1234567	2000>1000 2000=2000	1000<2000	2000 1000	empty 1000 1000 empty	empty empty
BVA				1 999999		1000000					

	Condition	Expected Result
Equivalence Partitioning		
1	Enter the value 926 into the input field	Value of electricity counter is shown in the field
2	Enter the value 256D into the input field	Letter “D’ is not typed into field
	Enter the 256g into the input field	Letter “g’ is not typed into field
3	Enter the value 3894* into the input field	Symbol “*’ is not typed into field
	Enter the value -1258 into the input field	Letter “-’ is not typed into field
4	Enter the value 1234 into the input field	Value of electricity counter is shown in the field
5	Enter the value 0 into the input field	The field is empty
	Enter the value 005 into the input field	The value 5 is shown in the field
6	Enter the value 1234567 into the input field	7th digit is not type into field
7	Enter the new value as 2000 and the value as 1000	Values of electricity counter are shown in the fields
	Enter the new value as 2000 and the value as 2000	Values of electricity counter are shown in the fields
8	Enter the new value as 1000 and the old value as 2000	Error message "Invalid value, please verify the new value of electricity counters" is appeared on the form
9	Enter the new value as 2000 and the old value as 1000	The cost of electricity is calculate and shown on the form
10	Set the new value – empty and the old value – 1000	Error message “Value of electricity counter is empty, please input the value" is appeared on the form
	Enter the new value – 1000 and the old value – empty	Error message “Value of electricity counter is empty, please input the value" is appeared on the form
11	Set the new value – empty and the old value – empty	Error message “Values of electricity counter are empty, please input the values " is appeared on the form
Boundary Values Analysis		
1	Enter the value 0 into the input field	Value of electricity counter is shown in the fields
2	Enter the value 999999 into the input field	Value of electricity counter is shown in the fields
3	Enter the value 1000000 into the input field	7th digit is not type into field

EP and BVA: Test Items		
	Test Items	**Test data**
1	Verify that data is shown in the field after entering the valid value	1. Any number 0 - 9 (e.g. 9205)
2	Verify that invalid values are not typed into field	1. Any letters A-Z, a-z (e.g. 256D,256g) 2. Any special characters “#$%^&”, etc (e.g.3894*, -1258)
3	Verify that value is shown in the field after entering the valid value (less than or equal to 6-digitis)	1. Any number 1-999999 (e.g.1234) 2. 1 3. 999999
4	Verify that 7th digit is not typed into field when entering the valid value more then 6-digitis	1. Any valid value more then 6-digitis (1234567) 2. 1000000
5	Verify that value can’t start from 0	1. Any number 0 – 9, but first number sets 0 (e.g.0, 005)
6	Verify that electricity costs are calculated when the new valid value is not less than an old value after clicking on the “Calc” button	1. New and old values are any valid value and NV>OV (e.g. NV =2000, OV=1000) 2. New and old values are same valid value and NV=OV (e.g NV=2000, OV=2000)
7	Verify that error message "Invalid value, please verify the new value of electricity counters" is shown when entering the new valid value is less than an old value after clicking on the “Calc” button	1. New and old values are any valid value and NV<OV (e.g. NV =1000, OL=2000)
8	Verify that electricity costs are calculated after clicking on the “Calc” button when the new and old value fields are filled with the valid data	1. New and Old fields are set valid values (e.g. NV =2000, OV=1000)
9	Verify that error message “Value of electricity counter is empty, please input the value" is shown after clicking on the “Calc” button with any empty field	1. New field is empty, Old field is set valid value (e.g. NV = empty, OV=1000) 2. New field is set valid value, Old field is empty (e.g. NV =1000, OV=empty)
10	Verify that error message “Values of electricity counter are empty, please input the values " is shown after clicking on the “Calc” button with both empty fields	1. New or Old fields are empty (e.g. NV =empty, OV=empty)

2. Decision tables

E-store works with three types of customers according to the total sum of their orders: **Regular, Silver** and **Gold**. The list of products to be shown to the client is built according to the rules: products with label Silver or Gold are placed in the top of the list for corresponding types of clients. All the rest products are alphabetically sorted, except the **promo products**, which have the highest priority and are placed the topmost.

1. Build decision table based on given information.
2. Cover requirements above by tests (write test cases' names and objectives) based on decision table analysis

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16
Promo product	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Gold client	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0
Silver client	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0
Regular client	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
Sort order	PGA	PGA	PGA	PGA	PSA	PSA	PRA	CdG	GA	GA	GA	GA	SA	SA	RA	CdG

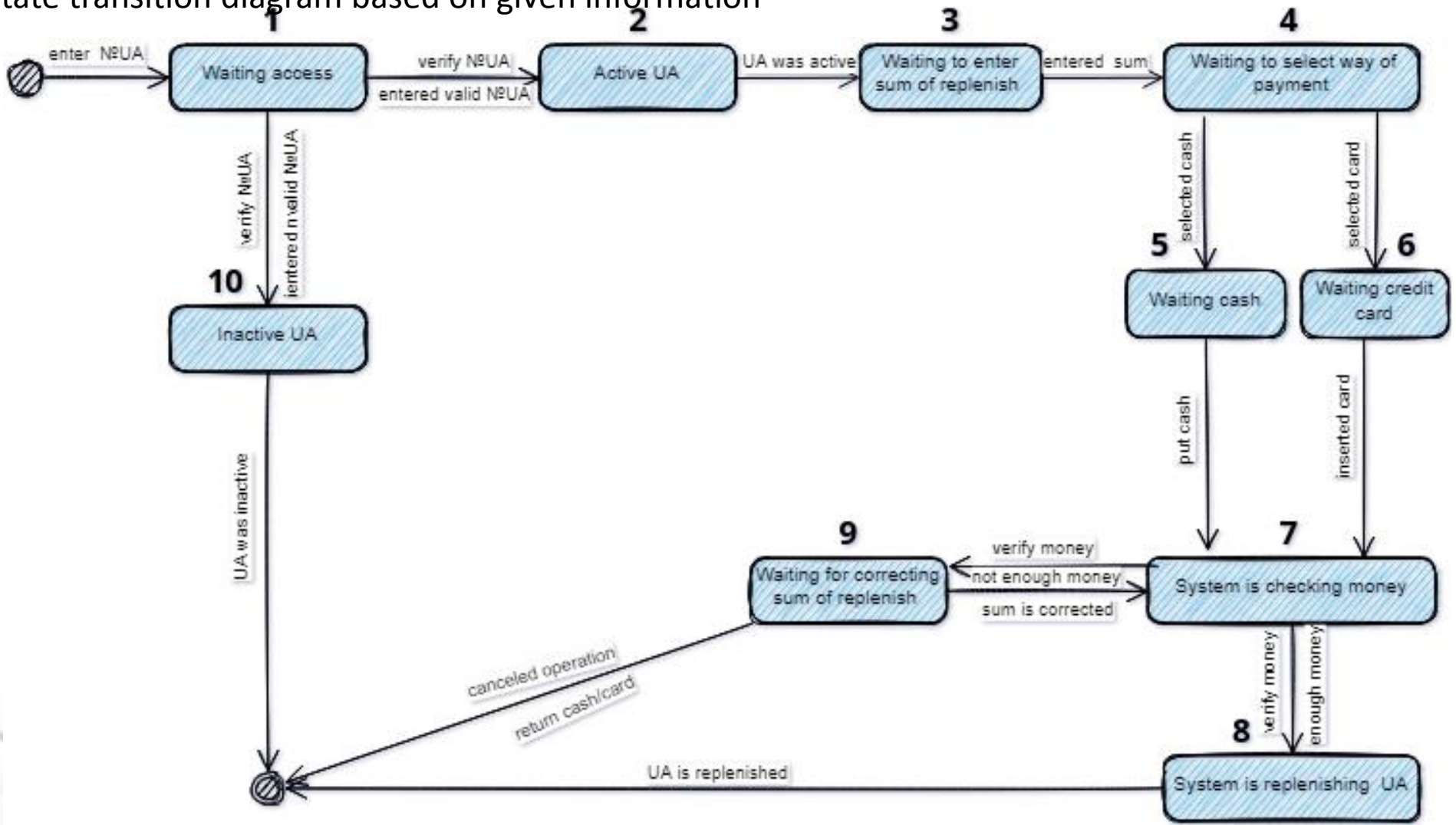
	1	2	3	4	5	6	7
	R1,R2, R3,R4	R5,R6	R7	R8,R16	R9,R10, R11,R12	R13,R14	R15
Promo product	1	1	1	1/0	0	0	0
Gold client	1	0	0	0	1	1	0
Silver client	1/0	1	0	0	1/0	1	0
Regular client	1/0	1/0	1	0	1/0	1/0	1
Sort order	PGA	PSA	PRA	CdG	GA	SA	RA

#	Condition	Outcome
1	A gold client visits the e-shop and the e-shop has promo products	The order of sorting products: 1. promo products 2. gold products 3. alphabetically
2	A silver client visits the e-shop and the e-shop has promo products	The order of sorting products: 1. promo products 2. silver products 3. alphabetically
3	A regular client visits the e-shop and the e-shop has promo products	The order of sorting products: 1. promo products 2. alphabetically
4	Any client doesn't visit the e-shop	-
5	A gold client visits the e-shop and the e-shop hasn't promo products	The order of sorting products: 1. gold products 3. alphabetically
6	A silver client visits the e-shop and the e-shop hasn't promo products	The order of sorting products: 1. silver products 2. alphabetically
7	A regular client visits the e-shop and the e-shop hasn't promo products	The order of sorting products: 1. alphabetically

3.State transition diagram

User wants to replenish the account using self-service kiosk. He enters the **account number** and in case it **is active** the user is asked to **enter the sum and select the way** of replenishment: from the **credit card** or **by cash**. After the cash/credit card is **inserted the system** checks whether **enough money** is available (available on the credit card or inserted into the kiosk). If there is enough money the account is **replenished**. In other case the user is asked to **correct sum** or **cancel** the operation.

Build state transition diagram based on given information



#	Condition	Outcome
1	Verification that active user account will be replenished by cash without correcting sum of replenish	1-2-3-4-5-7-8-9
2	Verification that active user account will be replenished by cash after correcting sum	1-2-3-4-5-7-9-7-8
3	Verification that active user account will be replenished the credit card without correcting sum of replenish	1-2-3-4-6-7-8-9
4	Verification that active user account will be replenished the credit card after correcting sum	1-2-3-4-6-7-9-7-8
5	Verification that user can cancel the replenishing by cash if there is not enough money	1-2-3-4-5-7-9
6	Verification that user can cancel operation of replenishing the credit card if there is not enough money	1-2-3-4-6-7-9
7	Verification that user can exit after entering the invalid account number	1-11


THANKS FOR YOUR
ATTENTION