

## In-class Exercise: Combinatorial Testing

a) Generate a combinatorial input model for the following system

*EasyBuy.com* is an online shopping website. When a customer is ready to check-out, the amount which he/she has to pay is computed as follows:

1. The transaction will be invalid if (1) the things you buy are out of stock, (2) the credit card information provided is incorrect, and (3) the balance on your card is insufficient.
2. The two main cancellation policies include:
  - cancellation within the day of the order → Full refund
  - cancellation after the day of the order → Full refund less a \$20 USD administrative fee
3. The three shipping policies include:
  - For an order over \$100
    - In-state shipping fee → Free
    - Interstate shipping fee → 50% off
  - For an order over \$200
    - Domestic shipping fee → Free
    - International shipping fee → 50% off
  - For an order over \$500
    - Domestic shipping fee → Free
    - International shipping fee → Free
4. Shipping method:
  - For domestic shipping
    - 1-day delivery
    - 2-day delivery
    - 1-week delivery
  - For international shipping
    - 1-week delivery
5. Special offers:
  - Buy-one-get-one on Labor Day, Thanksgiving, and Christmas
  - 20% off on Valentine's Day, Easter, and Memorial Day

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What is the Value that can Trigger certain condition.  
 For easy understanding and better structure, it is a good idea to divide one requirement to several factors (testing parameters).  
 Consider partitioning and pay attention to the boundary when extract testing parameters.  
 Possible values need to be concrete value.

- Assume a tester have already identified the following input parameters, please help him/her assign the values for those parameters.

<i>Factors</i>	<i>Possible Values</i>					
$F_1$ : Items in cart	In stock	Out of stock				
$F_2$ : Credit card information	Correct	Incorrect				
$F_3$ : Credit card balance	Sufficient	Insufficient				
$F_4$ : Cancellation after ? days	within the day of the order	after the day of the order	Do not cancel			
$F_5$ : Total price ( $x$ )	$x \leq 100$	$100 < x \leq 200$	$200 < x \leq 500$	$500 < x$		
$F_6$ : Shipping address	International	Domestic	Interstates			
$F_7$ : Shipping method	1-day delivery	2-day delivery	1-week delivery			
$F_8$ : Special offers	Labor Day	Thanksgiving	Christmas	Valentine	Easter	Memorial Day
	No special offer					

- Do we need constraints for test case generation? Why?

Yes. Because when the shipping address is international, only 1-week delivery can be selected. Without this constraint, invalid test cases can be generated.

Constraint is basically a discription that talks about whether a outcome or several outcome can or cannot happen when some condition or conditions are meet.