Domain Example: Frequent-Flyer
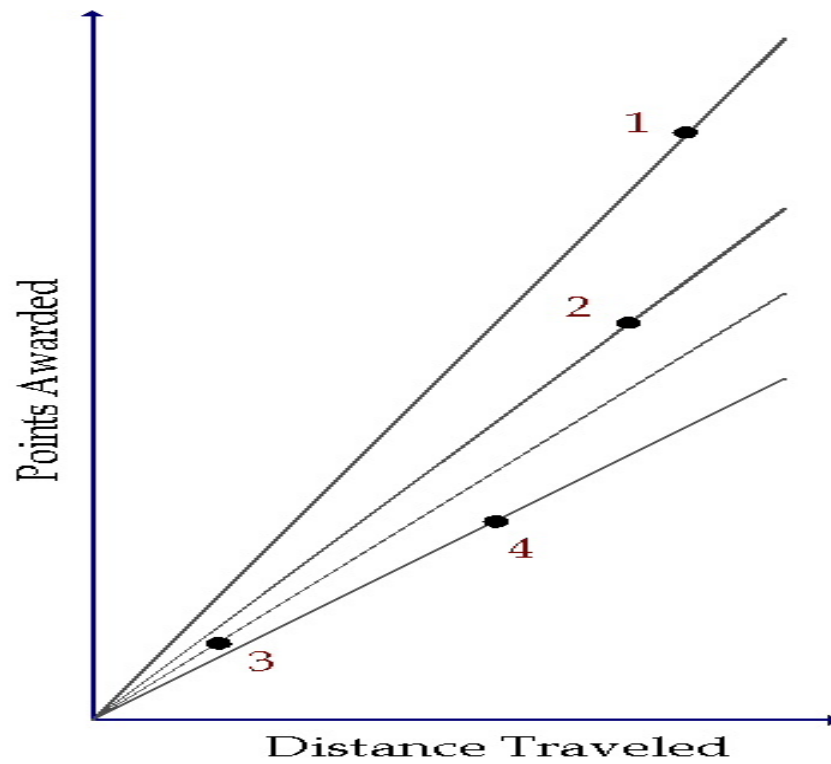
Status Level	None	Silver	Gold	Platinum
Trip Bonus	0%	25%	50%	100%
Distance Traveled	d	d	d	d
Points Awarded	d	1.25*d	1.5*d	2*d

In this example, the points awarded for any trip is a function of the traveler's status level and the distance traveled.

points = (1+bonus)*distance

Suppose our bug assumption is that the system will miscalculate the points awarded? We need to test at least one trip for each traveler status.
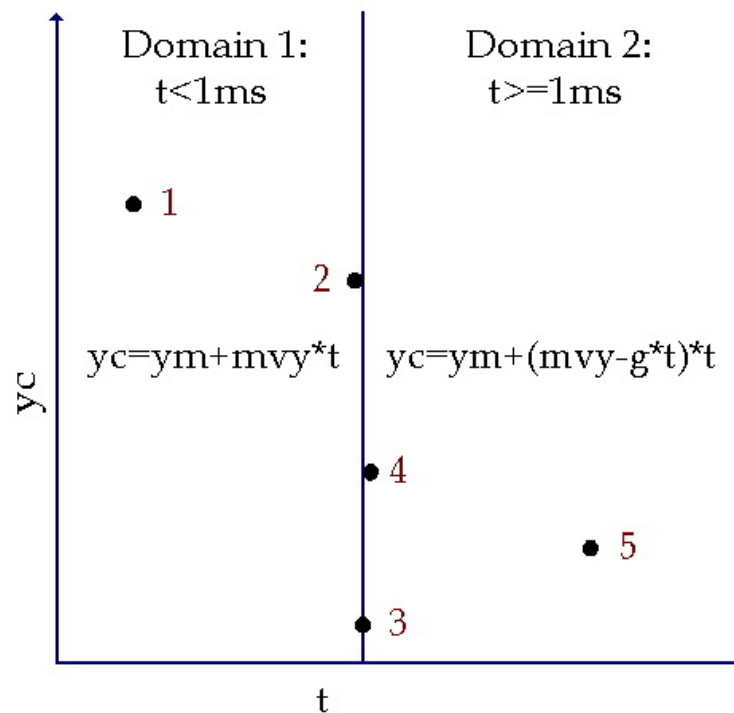
Frequent-Flyer Calculation

Possible Domain Test Values

Name	Description	Frequent-Flyer Example
On	A value on a domain boundary which may be inside or outside of the domain	1 (on platinum) 2 (on gold) 3 (on silver) 4 (on none)
Off	A value just off a domain boundary by the smallest recognizable amount and outside of the domain	1 (off gold) 2 (off platinum) 2 (off silver) 3 (off gold) 3 (off none) 4 (off silver)
In	A value inside the domain, not on or off	No such value possible
Out	A value outside the domain, not on or off	No such value possible

Aerospace Example

Domain 1:
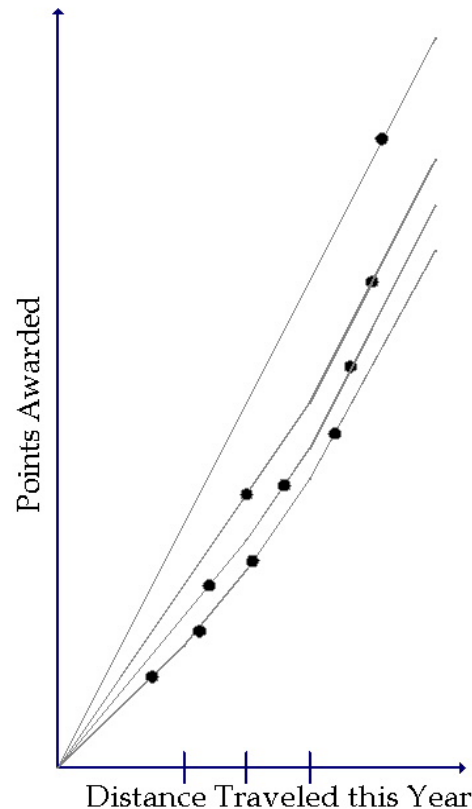t<1ms

Domain 2:
t>=1ms

$yc=ym+mvy*t$

$yc=ym+(mvy-g*t)*t$

yc

t

Description
To estimate the current vertical position (yc) of a large falling object (e.g., incoming missile) some time (t) after taking a velocity and position measurement, add to the measured vertical position (ym) the product of the measured vertical velocity (mvy) and thetime. However, if the time has reached some threshold (here, 1 millisecond), adjust for the increased downward velocity caused by gravity($g*t$).

Domain Analysis

	On	Off	In	Out
Dom 1	3	4	1	5
Dom 2	3	2	5	1

When Domain Rules Change

Description

Suppose we look at the total number of points awarded to a frequent-flyer for a whole year. A traveler's status is based on the total distance traveled in the current year or the total distance traveled in the past year. At 25,000, the status increases to silver. At 50,000, the status increases to gold. At 100,000, the status increases to platinum. Any distance traveled after the status changes accrues bonus points based on the new status, both in the current year or the next year.

Additional Domain Tests

Cover values in each rule segment. This adds one new test for travelers starting in the gold domain, two for travelers starting in the silver domain, and three for travelers starting with no status.