Assignment 4.1 Black box testing

1. The first testing problem

The equivalence classes for the long-distance telephone service function could be regarded as following :

The time setting of below is 24 hrs

a. start time:
   1. [0:00:00 a.m < start time < 2:00:00]
   2. [2:00:00< =start time < = 2:59:59]
   3. [2:59:59 < start time < 0:00:00 a.m]
   4. [invalid time : eg. 25:00:01 p.m]
b. start date:
   1. [January 1st =< start date < the first Saturday of April]
   2. [start date = the first Saturday of April]
   3. [the first Saturday of April < start date < the first Saturday of October]
   4. [start date = the first Saturday of October]
   5. [the first Saturday of October < start date < December 31st]
   6. [invalid date : eg. December 32nd]
c. end time:
   1. [0:00:00 a.m < end time < 2:00:00]
   2. [2:00:00< =end time < = 2:59:59]
   3. [2:59:59 < end time < 0:00:00 a.m]
   4. [invalid time : eg. 25:00:01 p.m]
d. end date:
   1. [January 1st =< start date < the first Saturday of April]
   2. [start date = the first Saturday of April]
   3. [the first Saturday of April < start date < the first Saturday of October]
   4. [start date = the first Saturday of October]
   5. [the first Saturday of October < start date < December 31st]
   6. [invalid date : eg. December 32nd]

The number of test cases is the cartesian product of the number of the equivalence classes of the 4 variable which is 576

Test cases for the strong robust equivalence class testing

Test cases	start time	start date	end time	end date	expected output
1	1.00 a.m	July 7th	1.20 a.m	July 7th	1
2	1.00 a.m	July 7th	2.10 a.m.	July 7th	6
3	1.00 a.m	July 7th	4.00 a.m	July 7th	17
4	1.00 a.m	July 7th	4:61 a.m	July 7th	invalid end time
5	4:61 a.m	July 7th	1.20 a.m	July 7th	error
6	4:61 a.m	July 7th	2.10 a.m.	July 7th	error
7	4:61 a.m	July 7th	4.00 a.m	July 7th	error
8	4:61 a.m	July 7th	4:61 a.m	July 7th	error
9	…	…	…	…	…
576	1.00 a.m	Dec 32st	1.20 a.m	Dec 31st	error

(2). test cases for edge testing
the edge of variable is listed as following:
start time and end time :{ 23:59, 00:00, 00:01, 1:59, 2:00, 2:01, 2:59, 3:00, 3:01}

start date and end date :{Dec 31st, Jan 1st, Jan 2nd, day before 1st Saturday of April, 1st Saturday of April, day after 1st Saturday of April, day before 1st Saturday of October, 1st Saturday of October, Oct 2nd, day after 1st Saturday of October,}
The number of test cases should be the cartesian product of the variables which is 8100

test case	start time	start date	end time	end date	expected output
1	0.00 a.m	Jan 1st	23:59	Jan 1st	142.9
2	0.00 a.m	Jan 1st	0.00 a.m	Jan 1st	0
3	0.00 a.m	Jan 1st	0.01 a.m	Jan 1st	0.05
4	0.00 a.m	Jan 1st	1.59 a.m	Jan 1st	10.9
5	0.00 a.m	Jan 1st	2.00 a.m	Jan 1st	11
6	0.00 a.m	Jan 1st	2.01 a.m	Jan 1st	11.1
7	0.00 a.m	Jan 1st	2.59 a.m	Jan 1st	16.9
8	0.00 a.m	Jan 1st	3.00 a.m	Jan 1st	17.0
9	0.00 a.m	Jan 1st	3.01 a.m	Jan 1st	17.1
…	…	…	…	…	…
8100	2.00 a.m	Dec 31st	2.00 a.m	Dec 31st	0

2. The second testing problem
The conditions as input of this problem can be listed as following :
C1 : age equals and larger than 63
C2 : age + teaching years larger than 80
C3: salary equals and larger than 90000
The actions as output of this problem can be listed as:
A1 : not reach retire age
A2: salary * 1.6%
A3 : 90000*1.6%+1.5%*(salary - 90000)
A4: salary * 1.55%
A5: 90000%1/55%+(salary - 90000)* 1.5%

Decision table

	R1	R2	R3	R4	R5
C1	F	T	T	T	T
C2	-	T	T	F	F
C3	-	T	F	T	F

A1	X				
A2					X
A3				X	
A4			X		
A5		X			