CS 589
SOFTWARE TESTING AND ANALYSIS

PROJECT

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Introduction:

The following types of testing is performed on the Vending Machine Class:

1. Model based testing

2. Default (ghost) transition testing

3. Multiple Condition Testing

1. Model Based Testing:

State Idle:

In	Out
T1	T2
T2	T3
T3	T7
T15	T6
T14	T4
T13	T5
T12	
T11	
T10	
T6	
T8	
T9	
T4	

Transistion Pairs:

(T1,T2)	(T1,T3)	(T1,T7)	(T1,T6)	(T1,T4)	(T1,T5)
(T2,T2)	(T2,T3)	(T2,T7)	(T2,T6)	(T2,T4)	(T2,T5)
(T3,T2)	(T3,T3)	(T3,T7)	(T3,T6)	(T3,T4)	(T3,T5)
(T15,T2)	(T15,T3)	(T15,T7)	(T15,T6)	(T15,T4)	(T15,T5)
(T14,T2)	(T14,T3)	(T14,T7)	(T14,T6)	(T14,T4)	(T14,T5)
(T13,T2)	(T13,T3)	(T13,T7)	(T13,T6)	(T13,T4)	(T13,T5)

(T12,T2)	(T12,T3)	(T12,T7)	(T12,T6)	(T12,T4)	(T12,T5)
(T11,T2)	(T11,T3)	(T11,T7)	(T11,T6)	(T11,T4)	(T11,T5)
(T10,T2)	(T10,T3)	(T10,T7)	(T10,T6)	(T10,T4)	(T10,T5)
(T6,T2)	(T6,T3)	(T6,T7)	(T6,T6)	(T6,T4)	(T6,T5)
(T8,T2)	(T8,T3)	(T8,T7)	(T8,T6)	(T8,T4)	(T8,T5)
(T9,T2)	(T9,T3)	(T9,T7)	(T9,T6)	(T9,T4)	(T9,T5)
(T4,T2)	(T4,T3)	(T4,T7)	(T4,T6)	(T4,T4)	(T4,T5)

Transition Pairs not executed (Idle State):

(T1,T7), (T1,T6), (T10,T6), (T14,T6), (T11,T6), (T12,T6), (T13,T6), (T15,T6), (T8, T6),(T9,T6)

since t+25 will always be greater than price , after execution of tea(), control never enters coin(t+25<price), unless setting the new price value.

State Coins Inserted:

In	Out
T7	T12
T20	T11
T21	T10
T23	T19
	T24
	T25
	T22
	T21
	T20

Transition Pairs:

(T7,T12)	(T7,T11)	(T7,T10)	(T7,T19)	(T7,T24)	(T7,T25)	(T7,T22)	(T7,T21)	(T7,T20)
(T20,T12)	(T20,T11)	(T20,T10)	(T20,T19)	(T20,T24)	(T20,T25)	(T20,T22)	(T20,T21)	(T20,T20)
(T21,T12)	(T21,T11)	(T21,T10)	(T21,T19)	(T21,T24)	(T21,T25)	(T21,T22)	(T21,T21)	(T21,T20)
(T23,T12)	(T23,T11)	(T23,T10)	(T23,T19)	(T23,T24)	(T23,T25)	(T23,T22)	(T23,T21)	(T23,T20)
(T19,T12)	(T19,T11)	(T19,T10)	(T19,T19)	(T19,T24)	(T19,T25)	(T19,T22)	(T19,T21)	(T19,T20)

Transition Pairs not executed (Coins Inserted State):

(T7,T21), (T7,T11), (T21,T12), (T19,T11), (T7,T24), (T7,T25), (T19,T25), (T21,T24)

The value of s is 0 in all the above transition pairs

State Sugar:

In	Out
T22	T13
T16	T14
T17	T15
T18	T16
	T17
	T18
	T23
	T26
	T27

Transistion Pairs:

(T22,T13)	(T22,T14)	(T22,T15)	(T22,T16)	(T22,T17)	(T22,T18)	(T22,T23)	(T22,T26)	(T22,T27)
(T16,T13)	(T16,T14)	(T16,T15)	(T16,T16)	(T16,T17)	(T16,T18)	(T16,T23)	(T16,T26)	(T16,T27)
(T17,T13)	(T17,T14)	(T17,T15)	(T17,T16)	(T17,T17)	(T17,T18)	(T17,T23)	(T17,T26)	(T16,T27)
(T18,T13)	(T18,T14)	(T18,T15)	(T18,T16)	(T18,T17)	(T18,T18)	(T18,T23)	(T18,T26)	(T18,T27)

Transition Pairs not executed (Sugar State):

(T17,T13), (T18,T15), (T18,T27),(T17,T26)

Small_cup will not be executed when s is 1 and large_cup will not be executed when s is 2.

State No Small Cups:

In	Out
T25	T9
T27	T28
T28	

Transistion Pairs:

(T25,T9)	(T25,T28)
(T27,T9)	(T27,T28)
(T28,T9)	(T28,T28)

State No Large Cups:

In	Out
T24	T8
T26	T29
T29	

Transition Pairs:

(T24,T8)	(T24,T29)
(T26,T8)	(T26,T29)
(T29,T8)	(T29,T29)

Test Cases:

2. Transition Pairing:

Test Case No	Test Case	Transitions Covered	Transition Pairs Covered
Test #1	insert_large_cups 5 insert_small_cups 5 set_price 30 coin dispose	T1,T2,T3,T4,T6,T5	(T1,T2),(T2,T3),(T3,T4), (T4,T6),(T6,T5)
Test #2	insert_large_cups 5 set_price 10 coin coin small_cup large_cup sugar coin small_cup large_cup sugar cancel dispose	T1,T2,T4,T7,T20,T21,T19,T22, T16,T17,T18,T23,T10,T5	(T1,T2),(T2,T4),(T4,T7), (T7,T20),(T20,T21), (T21,T19),(T19,T22),(T22,T 16), (T16,T17),(T17,T18), (T18,T23),(T23,T10),(T10,T 5)
Test #3	insert_large_cups 5 set_price 10 coin small_cup coin sugar small_cup coin sugar tea insert_large cups 5 set_price 30 coin dispose	T1,T3,T4,T7,T21,T20,T22,T17, T16,T23,T11,T2,T4,T6,T5	(T1,T3),(T3,T4),(T4,T7), (T7,T21),(T21,T20), (T20,T22),(T22,T17),(T17,T 16), (T16,T23),(T23,T11), (T11,T2),(T2,T4),(T4,T6),(T 6,T5)
Test #4	set_price 10 insert_large_cups 5 insert_large_cups 5 coin large_cup cancel coin cancel	T1,T4,T2,T2,T7,T19,T10,T7,T1 0,T7,T22,T18,T23,T22,T13,T2, T5	(T1,T4),(T4,T2),(T2,T2), (T2,T7),(T7,T19), (T19,T10),(T10,T7),(T7,T10), (T10,T7),(T7,T22),

	coin sugar large_cup sugar sugar tea insert_large_cups 5 dispose		(T22,T18),(T18,T23),(T23,T22),(T22,T13),(T13,T2),(T2,T5)
Test #5	set_price 30 insert_large_cups 5 coin coin cancel insert_small_cups 1 insert_large_cups 5 set_price 10 coin coin coin small_cup small_cup sugar sugar large_cup coin large_cup tea dispose	T1,T4,T2,T6,T7,T10,T3,T2,T4,T7,T20,T20,T21,T21,T22,T23,T19,T12,T5	(T1,T4),(T4,T2),(T2,T6), (T6,T7),(T7,T10), (T10,T3),(T3,T2),(T2,T4), (T4,T7),(T7,T20), (T20,T20),(T20,T21),(T21,T21),(T21,T22),(T22,T23),(T23,T19),(T19,T20),(T20,T19),(T12,T5)
Test #6	Dispose	T1,T5	(T1,T5)
Test #7	set_price 30 insert_small_cups 1 coin coin small_cup tea coin coin insert_small_cups 5 insert_large_cups 1 coin large_cup tea coin coin insert_large_cups 5 dispose	T1,T4,T3,T6,T7,T21,T25,T28,T28,T9,T2,T6,T7,T19,T24,T29,T29,T8,T5	(T1,T4),(T4,T3),(T3,T6), (T6,T7),(T7,T21), (T21,T25),(T25,T28),(T28,T28), (T28,T9),(T9,T2), (T2,T6),(T6,T7),(T7,T19),(T19,T24),(T24,T29),(T29,T29),(T29,T8),(T8,T5)
Test #8	set_price 5 set_price 10 insert_large_cups 5 insert_small_cups 2 coin small_cup tea coin large_cup large_cup small_cup large_cup coin tea	T1,T4,T4,T2,T3,T7,T21,T11,T7,T19,T19,T21,T19,T20,T12,T2,T7,T22,T18,T18,T13,T5	(T1,T4),(T4,T4),(T4,T2), (T2,T3),(T3,T7), (T7,T21),(T21,T11),(T11,T7), (T7,T19),(T19,T21), (T21,T19),(T19,T20),(T20,T12),(T12,T2),(T2,T7),(T7,T22),(T22,T18),(T18,T18),(T18,T13),(T13,T14),(T14,T5)
Test #9	set_price 10 insert_small_cups 1 coin small_cup cancel coin small_cup tea insert_small_cups 5 insert_small_cups 5 insert_small_cups 5 dispose	T1,T4,T3,T7,T21,T10,T7,T21,T25,T9,T3,T3,T5	(T1,T4),(T4,T3),(T3,T7), (T7,T21),(T21,T10), (T10,T7),(T7,T21),(T21,T25), (T25,T9),(T9,T3), (T3,T3),(T3,T5)
Test #10	insert_small_cups 5 set_price 10 coin sugar small_cup tea coin sugar small_cup cancel insert_large_cups 5 coin sugar small_cup sugar sugar tea dispose	T1,T3,T4,T7,T22,T17,T15,T7,T22,T17,T14,T2,T7,T22,T17,T23,T22,T15,T5	(T1,T3),(T3,T4),(T4,T7), (T7,T22),(T22,T17), (T17,T15),(T15,T7),(T7,T22), (T22,T17),(T17,T14), (T14,T2),(T2,T7),(T7,T22),(T22,T17),(T17,T23),(T23,T22),(T22,T15),(T15,T5)
Test #11	set_price 10 insert_small_cups 5 coin sugar cancel insert_small_cups 5 coin sugar cancel coin sugar cancel set_price 5 coin sugar	T1,T4,T3,T7,T22,T14,T3,T7,T22,T14,T7,T22,T14,T4,T7,T22,T14,T5	(T1,T4),(T4,T3),(T3,T7), (T7,T22),(T22,T14), (T14,T3),(T3,T7),(T7,T22), (T22,T14),(T14,T7), (T7,T22),(T22,T14),(T14,T4),(T4,T7),(T7,T22),(T22,T14

			)(T14,T5)
Test #12	set_price 10 insert_small_cups 5 coin sugar small_cup coin coin tea insert_large_cups 5 coin sugar small_cup tea insert_small_cups 2 coin sugar small_cup tea set_price 5 dispose	T1,T4,T3,T7,T22,T17,T16,T16, T15,T2,T7,T22,T17,T15,T3,T7, T22,T17,T15,T4,T5	(T1,T4),(T4,T3),(T3,T7), (T7,T22),(T22,T17), (T17,T16),(T16,T16),(T16,T 15), (T15,T2),(T2,T7), (T7,T22),(T22,T17),(T17,T1 5),(T15,T3),(T3,T7),(T7,T22)(T22,T17),(T17,T15),(T15, T4),(T4,T5)
Test #13	insert_large_cups 5 set_price 10 coin sugar large_cup small_cup small_cup large_cup coin tea insert_small_cups 5 coin sugar large_cup tea coin sugar large_cup tea dispose	T1,T2,T4,T7,T22,T18,T17,T17, T18,16,T13,T3,T7,T22,T18,T13 ,T7,T22,T18,T13,T5	(T1,T2),(T2,T4),(T4,T7), (T7,T22),(T22,T18), (T18,T17),(T17,T17),(T17,T 18), (T18,T16),(T16,T13), (T13,T3),(T3,T7),(T7,T22),(T15,T3),(T3,T7),(T7,T22)(T 22,T18),(T18,T13),(T13,T7) ,(T7,T22),(T22,T18),(T18,T 13),(T13,T5)
Test #14	set_price 150 coin coin insert_large_cups 5 coin insert_small_cups 5 coin set_price 200 dispose	T1,T4,T6,T6,T2,T6,T3,T6,T4,T5	(T1,T4),(T4,T6),(T6,T6), (T6,T2),(T2,T6), (T6,T3),(T3,T6),(T6,T4),(T4, T5)
Test #15	insert_small_cups 5 set_price 10 coin sugar small_cup sugar tea insert_small_cups 6 coin sugar small_cup sugar tea set_price 15 coin sugar small_cup sugar tea dispose	T1,T3,T4,T7,T22,T17,T23,T11, T3,T7,T22,T17,T23,T11,T4,T7, T22,T17,T23,T11,T5	(T1,T3),(T3,T4),(T4,T7), (T7,T22),(T22,T17), (T17,T23),(T23,T11),(T11,T 3), (T3,T7),(T7,T22), (T22,T17),(T17,T23),(T23,T 11),(T11,T4),(T4,T7),(T7,T2 2)(T22,T17),(T17,T23),(T23 ,T11),(T11,T5)
Test #16	insert_large_cups 10 set_price 10 coin sugar large_cup sugar tea insert_small_cups 5 coin sugar large_cup sugar tea coin sugar large_cup sugar tea set_price 20 dispose	T1,T2,T4,T7,T22,T18,T23,T12, T3,T7,T22,T18,T23,T12,T7,T22 ,T18,T23,T12,T4,T5	(T1,T2),(T2,T4),(T4,T7), (T7,T22),(T22,T18), (T18,T23),(T23,T12),(T12,T 3), (T3,T7),(T7,T22), (T22,T18),(T18,T23),(T23,T 12),(T12,T7),(T7,T22),(T18, T23),(T23,T12),(T12,T4),(T 4,T5)
Test #17	set_price 20 coin cancel insert_large_cups 10 coin cancel set_price 10 coin sugar coin large_cup cancel coin sugar coin cancel dispose	T1,T4,T7,T10,T2,T7,T10,T4,T7, T22,T16,T18,T14,T7,T22,T16,T 14,T5	(T1,T4),(T4,T7),(T7,T10), (T10,T2),(T2,T7), (T7,T10),(T10,T4),(T4,T7), (T7,T22),(T22,T16), (T16,T18),(T18,T14),(T14,T 7),(T7,T22),(T22,T16),(T16, T14),(T14,T5)
Test #18	insert_small_cups 1 set_price 10 coin sugar	T1,T3,T4,T7,T22,T17,T27,T28, T9,T7,T22,T17,T27,T9,T5	(T1,T3),(T3,T4),(T4,T7), (T7,T22),(T22,T17),

	small_cup tea coin insert_small_cups 1 coin sugar small_cup tea insert_small_cups 1 dispose		(T17,T27),(T27,T28),(T28,T9), (T9,T7),(T7,T22), (T22,T17),(T17,T27),(T27,T9),(T9,T5)
Test #19	insert_small_cups 1 set_price 10 coin sugar small_cup tea insert_small_cups 1 set_price 15 26,T8,T5dispose	T1,T3,T4,T7,T2,T17,T27,T9,T4,T5	(T1,T3),(T3,T4),(T4,T7), (T7,T22),(T22,T17), (T17,T27),(T27,T9),(T9,T4), (T4,T5)
Test #20	insert_large_cups 1 set_price 10 coin sugar large_cup tea coin insert_large_cups 1 insert_small_cups 5 coin sugar large_cup tea insert_large_cups 1 coin sugar large_cup tea insert_large_cups 1 dispose	T1,T2,T4,T7,T22,T18,T26,T29,T8,T3,T7,T22,T18,T26,T8,T7,T22,T18,T5	(T1,T2),(T2,T4),(T4,T7), (T7,T22),(T22,T18), (T18,T26),(T26,T29),(T29,T8), (T8,T3),(T3,T7), (T7,T22),(T22,T18),(T18,T26),(T26,T8),(T8,T7),(T7,T22),(T22,T18),(T18,T26),(T26,T8),(T8,T5)
Test #21	insert_large_cups 1 set_price 10 coin large_cup tea insert_large_cups 1 set_price 15 coin large_cup tea insert_large_cups 1 insert_large_cups 4 dispose	T1,T2,T4,T7,T19,T24,T8,T4,T7,T19,T24,T8,T2,T5	(T1,T2),(T2,T4),(T4,T7), (T7,T19),(T19,T24), (T24,T8),(T8,T4),(T4,T7), (T7,T19),(T19,T24), (T24,T8),(T8,T2),(T2,T5)
Test #22	insert_small_cups 5 set_price 10 coin small_cup coin tea coin coin cancel dispose	T1,T3,T4,T7,T21,T20,T11,T7,T20,T10,T5	(T1,T3),(T3,T4),(T4,T7), (T7,T21),(T21,T20), (T20,T11),(T11,T7),(T7,T20), (T20,T10),(T10,T5)
Test #23	insert_large_cups 1 set_price 10 coin large_cup coin tea insert_large_cups 5 insert_small_cups 1 coin small_cup coin tea insert_small_cups 5 dispose	T1,T2,T4,T7,T19,T20,T24,T8,T3,T7,T21,T20,T25,T9,T5	(T1,T2),(T2,T4),(T4,T7), (T7,T19),(T19,T20), (T20,T24),(T24,T8),(T8,T3), (T3,T7),(T7,T21),(T21,T20), (T20,T25),(T25,T9),(T9,T5)
Test #24	insert_large_cups 1 set_price 10 coin sugar large_cup sugar tea insert_large_cups 5 insert_small_cups 1 coin sugar small_cup sugar tea insert_small_cups 5 dispose	T1,T2,T4,T7,T22,T18,T23,T24,T8,T3,T7,T22,T17,T23,T25,T9,T5	(T1,T2),(T2,T4),(T4,T7), (T7,T22),(T22,T18), (T18,T23),(T23,T24),(T24,T8), (T8,T3),(T3,T7),(T7,T22),(T22,T17),(T17,T23),(T23,T25),(T25,T9),(T9,T5)
Test #25	insert_large_cups 5 set_price 10 coin sugar sugar small_cup sugar sugar coin large_cup tea dispose	T1,T2,T4,T7,T22,T23,T21,T22,T23,T20,T19,T12,T5	(T1,T2),(T2,T4),(T4,T7), (T7,T22),(T22,T23), (T23,T21),(T21,T22),(T22,T23), (T23,T20),(T20,T19),(T19,T12),(T12,T5)

Test #26	insert_large_cups 1 insert_small_cups 1 set_price 10 coin large_cup sugar tea insert_large_cups 5 coin small_cup sugar tea insert_small_cups 5 dispose	T1,T2,T3,T4,T7,T19,T22,T26,T8,T7,T21,T22,T27,T9,T5	(T1,T2),(T2,T3),(T3,T4), (T4,T7),(T7,T19), (T19,T22),(T22,T26),(T26,T8), (T8,T7),(T7,T21),(T21,T22), (T22,T27),(T27,T9),(T9,T5)
Test #27	insert_large_cups 1 insert_small_cups 1 set_price 10 coin sugar large_cup coin tea insert_large_cups 5 coin sugar small_cup coin tea insert_small_cups 5 dispose	T1,T2,T3,T4,T7,T22,T18,T16,T26,T8,T7,T22,T17,T16,T27,T9,T5	(T1,T2),(T2,T3),(T3,T4), (T4,T7),(T7,T22), (T22,T18),(T18,T16),(T16,T26), (T26,T8),(T8,T7),(T7,T22),(T22,T17),(T17,T16),(T16,T27),(T27,T9),(T9,T5)

3. Default (Ghost) Transitions:

State	Default Transitions
Idle	coin (price==0) small_cup() large_cup() sugar() tea() insert_large_cups(int n) [n<=0] insert_small_cups(int n) [n<=0] set_price (int p) [p<=0] cancel()
Coins Inserted	tea() [k==0 || s==0 || k1==0] insert_large_cups(int n) insert_small_cups(int n) set_price(int p) dispose()
Sugar	tea() [k==0 || s==0 || k1==0] insert_large_cups(int n) insert_small_cups(int n) set_price(int p) dispose()
No_large_cups	small_cup()

	large_cup() sugar() tea() insert_large_cups(int n) [n<=0] insert_small_cups(int n) set_price (int p) cancel() dispose()
No_small_cups	small_cup() large_cup() sugar() tea() insert_large_cups(int n) insert_small_cups(int n) [n<=0] set_price(int p) cancel() dispose()

Test Case No	Test Case
Test #28	set_price -5 coin small_cup large_cup sugar tea insert_large_cups -2 insert_small_cups -8 cancel dispose
Test #29	set_price 15 insert_small_cups 1 coin small_cup tea small_cup large_cup sugar tea insert_large_cups 5 insert_small_cups -2 set_price 5 cancel dispose insert_small_cups 1 dispose
Test #30	set_price 15 insert_large_cups 1 coin large_cup tea small_cup large_cup sugar tea insert_large_cups -5 insert_small_cups 2 set_price 5 set_price -5 cancel dispose insert_large_cups 1 dispose
Test #31	set_price 15 coin sugar tea insert_large_cups 5 insert_small_cups 5

	insert_small_cups -5 insert_large_cups -5 set_price 5 dispose cancel dispose
Test #32	set_price 15 coin tea insert_large_cups 5 insert_small_cups 5 set_price 5 dispose cancel dispose
Test #33	set_price 15 insert_large_cups 1 coin small_cup tea dispose cancel dispose
Test #34	insert_small_cups 5 set_price 10 coin sugar large_cup tea cancel dispose
Test #35	insert_large_cups 5 set_price 10 coin small_cup tea dispose
Test #36	insert_large_cups 5 set_price 10 coin sugar small_cup tea cancel dispose
Test #37	insert_large_cups 1 set_price 10 coin small_cup tea cancel dispose
Test #38	insert_large_cups 1 set_price 10 coin sugar small_cup tea cancel dispose
Test #39	insert_small_cups 1 set_price 10 coin large_cup tea cancel dispose
Test #40	insert_small_cups 5 set_price 10 coin large_cup tea cancel dispose

4. **Multiple Condition Testing:**

- Operation: Coin()
- Condition : x==1

x==1	Test Case
T	Test case #1
F	Test Case #2

- Operation : coin()

Condition: ((t + 25 >= price) && (price > 0))

t + 25 >= price	price > 0	Test Case
T	T	Test Case #2
T	F	Test Case #28
F	T	Test Case #1
F	F	Not Possible

The price cannot be a negative value or a zero. Hence either it should be greater than 0 or less than or equal to (t+25).

- Operation : coin()

Condition: (t + 25 < price)

t + 25 < price	Test Case
T	Test Case #1
F	Test Case #28

- Operation : coin()

Condition: ((x > 1) && (x < 6))

x > 1	x < 6	Test Case
T	T	Test Case #2

T	F	Not Possible
F	T	Not Possible
F	F	Not Possible

- Operation : small_cup()

Condition: ((x == 2) || (x == 3))

x == 2	x == 3	Test Case
T	T	Not Possible
T	F	Test Case #2
F	T	Test Case #2
F	F	Test Case #28

The value of x can either be 2 or 3. It cannot have both the values at the same time.

- Operation : large_cup()

Condition: ((x == 2) || (x == 3))

x == 2	x == 3	Test Case
T	T	Not Possible
T	F	Test Case #2
F	T	Test Case #2
F	F	Test Case #28

The value of x can either be 2 or 3. It cannot be true in both the cases.

- Operation : sugar()

Condition: ((x == 2) || (x == 3))

x == 2	x == 3	Test Case
T	T	Not Possible
T	F	Test Case #2
F	T	Test Case #2
F	F	Test Case #28

The value of x can either be 2 or 3. It cannot have both the values at the same time.

- Operation : sugar()

Condition: (x == 2)

X==2	Test Case
T	Test Case #2
F	Test Case #2

- Operation : tea()

Condition: ((x == 2) || (x == 3))

X==2	X==3	Test Case
T	T	Not Possible
T	F	Test Case #21
F	T	Test Case #12
F	F	Test Case #28

- Operation : tea()

Condition : ((x == 2) && (k1 > 1) && (s == 2))

x == 2	k1 > 1	s == 2	Test Case
T	T	T	Test Case #22
T	T	F	Test Case #8
T	F	T	Test Case #33
T	F	F	Test Case #21
F	T	T	Test Case #10
F	T	F	Test Case #34
F	F	T	Test Case #18
F	F	F	Test Case #13

- Operation : tea()

Condition: ((x == 2) && (k > 1) && (s == 1))

x == 2	k > 1	s == 1	Test Case
T	T	T	Test Case #8
T	T	F	Test Case #35
T	F	T	Test Case #21
T	F	F	Test Case #22
F	T	T	Test Case #13
F	T	F	Test Case #36
F	F	T	Test Case #34
F	F	F	Test Case #10

- Operation : tea()

Condition: ((x == 2) && (k == 1) && (s == 1))

x == 2	k == 1	s == 1	Test Case
T	T	T	Test Case #21
T	T	F	Test Case #37
T	F	T	Not Possible
T	F	F	Test Case #35
F	T	T	Test Case #20
F	T	F	Test Case #38
F	F	T	Test Case #34
F	F	F	Test Case #10

- Operation : tea()

Condition: ((x == 2) && (k1 == 1) && (s == 2))

x == 2	K1 == 1	s == 2	Test Case
T	T	T	Test Case #7
T	T	F	Test Case #39
T	F	T	Test Case #35
T	F	F	Test Case #40
F	T	T	Test Case #18
F	T	F	Test Case #27
F	F	T	Test Case #10
F	F	F	Test Case #34

- Operation : tea()

Condition: ((x == 3) && (k1 == 1) && (s == 2))

x == 3	K1 == 1	s == 2	Test Case
T	T	T	Test Case #18
T	T	F	Test Case #27
T	F	T	Test Case #10
T	F	F	Test Case #34
F	T	T	Not Possible
F	T	F	Test Case #39
F	F	T	Test Case #35
F	F	F	Test Case #40

- Operation : tea()

Condition: ((x == 3) && (k == 1) && (s == 1))

x == 3	K == 1	s == 1	Test Case
T	T	T	Test Case #20
T	T	F	Test Case #38
T	F	T	Test Case #34
T	F	F	Test Case #10
F	T	T	Not Possible
F	T	F	Test Case #37
F	F	T	Test Case #40
F	F	F	Test Case #35

- Operation : tea()

Condition : ((x == 3) && (k1 > 1) && (s == 2))

x == 3	K1 > 1	s == 2	Test Case
T	T	T	Test Case #10
T	T	F	Test Case #34
T	F	T	Test Case #36

T	F	F	Test Case #13
F	T	T	Not Possible
F	T	F	Test Case #40
F	F	T	Test Case #35
F	F	F	Test Case #39

- Operation : tea()

Condition: ((x == 3) && (k > 1) && (s == 1))

x == 3	K > 1	s == 1	Test Case
T	T	T	Test Case #13
T	T	F	Test Case #36
T	F	T	Test Case #34
T	F	F	Test Case #38
F	T	T	Not Possible
F	T	F	Test Case #35
F	F	T	Test Case #39
F	F	F	Test Case #37

- Operation : insert_small_cups(int n)

Condition: ((x == 1) && (n > 0))

x == 1	n > 0	Test Case
T	T	Test Case #1
T	F	Test Case #28
F	T	Test Case #24
F	F	Test Case #29

- Operation : insert_small_cups(int n)

Condition: ((x == 4) && (n > 0))

x == 4	n > 0	Test Case
T	T	Test Case #24
T	F	Test Case #29
F	T	Test Case #30
F	F	Test Case #31

- Operation : insert_large_cups(int n)

Condition: ((x == 1) && (n > 0))

x == 1	n > 0	Test Case
T	T	Test Case #1
T	F	Test Case #28

F	T	Test Case #24
F	F	Test Case #30

- Operation : insert_large_cups(int n)

Condition: ((x == 5) && (n > 0))

x == 5	n > 0	Test Case
T	T	Test Case #24
T	F	Test Case #30
F	T	Test Case #29
F	F	Test Case #31

- Operation : set_price(int p)

Condition: ((x == 1) && (p > 0))

x == 1	p > 0	Test Case
T	T	Test Case #1
T	F	Test Case #28
F	T	Test Case #32
F	F	Test Case #30

- Operation : cancel()

Condition: ((x == 2) || (x == 3))

x == 2	x==3	Test Case
T	T	Not Possible
T	F	Test Case #32
F	T	Test Case #31
F	F	Test Case #30

- Operation : dispose()
- Condition: (x==1)

X==1	Test Case
T	Test Case #6
F	Test Case #32

5. **Test Case Results:**

- Test case #1:

insert_large_cups 5 insert_small_cups 5 set_price 30 coin dispose

1.Set_Price
2.Insert_Large_Cups
3.Insert_Small_Cups

4.Coin
5.Small_Cup
6.Large_Cup
7.Sugar
8.Tea
9.Cancel
10.Dispose
11.Quit
12.Show_state
13.Show_All_Values

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
30
The value returned is =1

Enter your choice:
4
Coin
The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
The value returned is=1

"Test Case Passed".

- Test Case #2:

insert_large_cups 5 set_price 10 coin coin small_cup large_cup sugar coin small_cup large_cup sugar cancel dispose

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
4
Coin
RETURN COIN

The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
9
Cancel
RETURN COINS
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

- Test Case #3:

    insert_large_cups 5 set_price 10 coin small_cup coin sugar small_cup coin sugar tea
    insert_large_cups 5 set_price 30 coin dispose

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

```
Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA
    The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
```

5
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
30
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test case Passed"

- Test Case #4:

  set_price 10 insert_large_cups 5 insert_large_cups 5 coin large_cup cancel coin cancel coin sugar large_cup sugar sugar tea insert_large_cups 5 dispose

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5

The value returned is=1

Enter your choice:
4
Coin
The value returned is=1

Enter your choice:
6
Large_Cup
The value returned is=1

Enter your choice:
9
Cancel
RETURN COINS
The value returned is=1

Enter your choice:
4
Coin
The value returned is=1

Enter your choice:
9
Cancel
RETURN COINS
The value returned is=1

Enter your choice:
4
Coin
The value returned is=1

Enter your choice:
7
Sugar
The value returned is=1

Enter your choice:
6
Large_Cup
The value returned is=1

Enter your choice:
7
Sugar
The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA WITH SUGAR
    The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

- Test Case #5:

  set_price 30 insert_large_cups 5 coin coin cancel insert_small_cups 1 insert_large_cups 5
  set_price 10 coin coin coin small_cup small_cup sugar sugar large_cup coin large_cup tea
  dispose

Enter your choice:
1
Set_Price(int p)
Enter value of p
30
    The value returned is =1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
4

Coin
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
9
Cancel
RETURN COINS
    The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:

```
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1
Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA
    The value returned is=1

Enter your choice:
10
```

Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passes"

- Test case #6:

    Dispose

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

- Test Case #7:

    set_price 30 insert_small_cups 1 coin coin small_cup tea coin coin insert_small_cups 5
    insert_large_cups 1 coin coin large_cup tea coin coin insert_large_cups 5 dispose

Enter your choice:
1
Set_Price(int p)
Enter value of p
30
    The value returned is =1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
5
Small_Cup

The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA
The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
The value returned is=1

Enter your choice:
4
Coin
The value returned is=1

Enter your choice:
4
Coin
The value returned is=1

Enter your choice:
6
Large_Cup
The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA
    The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed"

- Test Case #8:

  set_price 5 set_price 10 insert_large_cups 5 insert_small_cups 2 coin small_cup tea coin
  large_cup large_cup small_cup large_cup coin tea insert_large_cups 1 coin sugar
  large_cup large_cup tea set_price 10 dispose

Enter your choice:
1
Set_Price(int p)
Enter value of p
5
    The value returned is =1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
2
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:

6
Large_Cup
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA
    The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1
Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA WITH SUGAR
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed"

- Test Case #9:

  set_price 10 insert_small_cups 1 coin small_cup cancel coin small_cup tea
  insert_small_cups 5 insert_small_cups 5 insert_small_cups 5 dispose

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
9
Cancel
RETURN COINS
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA
    The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed"

- Test Case #10:

    insert_small_cups 5 set_price 10 coin sugar small_cup tea coin sugar small_cup cancel
    insert_large_cups 5 coin sugar small_cup sugar sugar tea dispose

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA WITH SUGAR

The value returned is=1

Enter your choice:
12
Show_State

State : Idle

Enter your choice:
13
Show_All_Values
Price=10
No_of_Large_Cups=0
No_of_small_Cups=4
T=0
CurrentState=1

Enter your choice:
4
Coin
The value returned is=1

Enter your choice:
7
Sugar
The value returned is=1

Enter your choice:
5
Small_Cup
The value returned is=1

Enter your choice:
9
Cancel
RETURN COINS
The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
The value returned is=1

Enter your choice:
4
Coin

The value returned is=1

Enter your choice:
12
Show_State

State : Coin Inserted

Enter your choice:
7
Sugar
The value returned is=1

Enter your choice:
5
Small_Cup
The value returned is=1

Enter your choice:
7
Sugar
The value returned is=1

Enter your choice:
7
Sugar
The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA WITH SUGAR
The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
The value returned is=1

"Test Case Passed".

- Test Case #11:

set_price 10 insert_small_cups 5 coin sugar cancel insert_small_cups 5 coin sugar cancel coin sugar cancel set_price 5 coin sugar cancel dispose

Enter your choice:

```
1
Set_Price(int p)
Enter value of p
10
     The value returned is =1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
     The value returned is=1

Enter your choice:
4
Coin
     The value returned is=1

Enter your choice:
7
Sugar
     The value returned is=1


Enter your choice:
9
Cancel
RETURN COINS
     The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
     The value returned is=1

Enter your choice:
4
Coin
     The value returned is=1

Enter your choice:
7
Sugar
     The value returned is=1

Enter your choice:
```

9
Cancel
RETURN COINS
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
9
Cancel
RETURN COINS
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
5
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
9
Cancel
RETURN COINS
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN

The value returned is=1
"Test Case Passed"

- Test Case #12:

    set_price 10 insert_small_cups 5 coin sugar small_cup coin coin tea insert_large_cups 5
    coin sugar small_cup tea insert_small_cups 2 coin sugar small_cup tea set_price 5 dispose

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA WITH SUGAR
    The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA WITH SUGAR
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
5
    The value returned is =1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

"Test Case Passed"

- Test Case #13:
  insert_large_cups 5 set_price 10 coin sugar large_cup small_cup small_cup large_cup coin tea insert_small_cups 5 coin sugar large_cup tea coin sugar large_cup tea dispose

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
6

Large_Cup
   The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
   The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA WITH SUGAR
   The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
   The value returned is=1

Enter your choice:
4
Coin
   The value returned is=1

Enter your choice:
7
Sugar
   The value returned is=1

Enter your choice:
6
Large_Cup
   The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA WITH SUGAR
   The value returned is=1

Enter your choice:
4
Coin
   The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA WITH SUGAR
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed"

- Test Case #14:

  set_price 150 coin coin insert_large_cups 5 coin insert_small_cups 5 coin set_price 200 dispose

Enter your choice:
1
Set_Price(int p)
Enter value of p
150
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
2

Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
200
    The value returned is =1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed"

- Test Case #15:

  insert_small_cups 5 set_price 10 coin sugar small_cup sugar tea insert_small_cups 6 coin
  sugar small_cup sugar tea set_price 15 coin sugar small_cup sugar tea dispose

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA
    The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
6
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7

Sugar
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
15
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
8

Tea
DISPOSE SMALL CUP OF TEA
    The value returned is=1
Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed"

- Test Case #16:

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
10
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:

8
Tea
DISPOSE LARGE CUP OF TEA
 The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
 The value returned is=1

Enter your choice:
4
Coin
 The value returned is=1

Enter your choice:
7
Sugar
 The value returned is=1

Enter your choice:
6
Large_Cup
 The value returned is=1

Enter your choice:
7
Sugar
 The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA
 The value returned is=1

Enter your choice:
4
Coin
 The value returned is=1

Enter your choice:
7
Sugar
 The value returned is=1

Enter your choice:
6
Large_Cup
 The value returned is=1

7
Sugar
 The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA
 The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
20
 The value returned is =1

Enter your choice:
10
Dispose
SHUT DOWN
 The value returned is=1

 "Test case passed".

- Test Case #17:

Enter your choice:
1
Set_Price(int p)
Enter value of p
20
 The value returned is =1

Enter your choice:
4
Coin
 The value returned is=1

Enter your choice:
9
Cancel

RETURN COINS
    The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
10
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
9
Cancel
RETURN COINS
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
9
Cancel
RETURN COINS
 The value returned is=1

Enter your choice:
4
Coin
 The value returned is=1

Enter your choice:
7
Sugar
 The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
 The value returned is=1

Enter your choice:
9
Cancel
RETURN COINS
 The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
 The value returned is=1

 "Test Case Passed".

- Test Case #18:

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
1
 The value returned is=1

Enter your choice:
1

Set_Price(int p)
Enter value of p
10
 The value returned is =1

Enter your choice:
4
Coin
 The value returned is=1

Enter your choice:
7
Sugar
 The value returned is=1

Enter your choice:
5
Small_Cup
 The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA WITH SUGAR
 The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
 The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
1
 The value returned is=1

Enter your choice:
4
Coin
 The value returned is=1

Enter your choice:
7
Sugar
 The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA WITH SUGAR
    The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed"

- Test Case #19:

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA WITH SUGAR
    The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
15
    The value returned is =1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed".

- Test Case #20:

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
     The value returned is =1

Enter your choice:
4
Coin
     The value returned is=1

Enter your choice:
7
Sugar
     The value returned is=1

Enter your choice:
6
Large_Cup
     The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA WITH SUGAR
     The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
     The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
     The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
     The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA WITH SUGAR
    The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA WITH SUGAR
    The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
     The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
     The value returned is=1

     "Test Case passed"

- Test Case #21:

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
     The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
     The value returned is =1

Enter your choice:
4
Coin
     The value returned is=1

Enter your choice:
6
Large_Cup
     The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA
     The value returned is=1

```
Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
     The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
15
     The value returned is =1

Enter your choice:
4
Coin
     The value returned is=1

Enter your choice:
6
Large_Cup
     The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA
     The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
     The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
4
     The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
```

The value returned is=1

"Test case Passed".

- Test Case #22:

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
   The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
   The value returned is =1

Enter your choice:
4
Coin
   The value returned is=1

Enter your choice:
5
Small_Cup
   The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
   The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA
   The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
   The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
9
Cancel
RETURN COINS
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed".

- Test Case #23:

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
4

Coin
RETURN COIN
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA
    The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA
    The value returned is=1

Enter your choice:
3

Insert_Small_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed".

- Test Case #24:

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA
    The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA
    The value returned is=1

Enter your choice:

3
Insert_Small_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed".

- Test Case #25:

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
5
Small_Cup

The value returned is=1

Enter your choice:
7
Sugar
The value returned is=1

Enter your choice:
7
Sugar
The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
The value returned is=1

Enter your choice:
6
Large_Cup
The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA
The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
The value returned is=1

"Test Case Passed".

- Test Case #26:

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
The value returned is=1

Enter your choice:
3

```
Insert_Small_Cups(int n)
Enter value of n
1
     The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
     The value returned is =1

Enter your choice:
4
Coin
     The value returned is=1

Enter your choice:
6
Large_Cup
     The value returned is=1

Enter your choice:
7
Sugar
     The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA WITH SUGAR
     The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
     The value returned is=1

Enter your choice:
4
Coin
     The value returned is=1

Enter your choice:
5
Small_Cup
```

The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA WITH SUGAR
    The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed"

- Test Case #27:

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p

10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA WITH SUGAR
    The value returned is=1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:

5
Small_Cup
    The value returned is=1

Enter your choice:
4
Coin
RETURN COIN
    The value returned is=1

Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA WITH SUGAR
    The value returned is=1

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed".

Ghost Test Cases Results:

- Test Case #28:

Enter your choice:
1
Set_Price(int p)
Enter value of p
-5
    The value returned is =0

Enter your choice:
4
Coin
    The value returned is=0

Enter your choice:
5
Small_Cup
    The value returned is=0

Enter your choice:
6
Large_Cup
    The value returned is=0
Enter your choice:
7
Sugar
    The value returned is=0

Enter your choice:
8
Tea
    The value returned is=0

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
-2
    The value returned is=0

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
-8
    The value returned is=0

Enter your choice:
9
Cancel
    The value returned is=0

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case passed".

- Test Case #29:

```
Enter your choice:
1
Set_Price(int p)
Enter value of p
15
     The value returned is =1


Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
1
     The value returned is=1


Enter your choice:
4
Coin
     The value returned is=1


Enter your choice:
5
Small_Cup
     The value returned is=1


Enter your choice:
8
Tea
DISPOSE SMALL CUP OF TEA
     The value returned is=1


Enter your choice:
5
Small_Cup
     The value returned is=0


Enter your choice:
6
Large_Cup
     The value returned is=0


Enter your choice:
7
Sugar
     The value returned is=0


Enter your choice:
8
Tea
```

The value returned is=0

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
The value returned is=0

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
-2
The value returned is=0

Enter your choice:
1
Set_Price(int p)
Enter value of p
5
The value returned is =0

Enter your choice:
9
Cancel
The value returned is=0

Enter your choice:
10
Dispose
The value returned is=0

"Test Case Passed".

- Test Case #30:

Enter your choice:
1
Set_Price(int p)
Enter value of p
15
The value returned is =1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n

1
   The value returned is=1

Enter your choice:
4
Coin
   The value returned is=1

Enter your choice:
6
Large_Cup
   The value returned is=1

Enter your choice:
8
Tea
DISPOSE LARGE CUP OF TEA
   The value returned is=1

Enter your choice:
5
Small_Cup
   The value returned is=0

Enter your choice:
6
Large_Cup
   The value returned is=0

Enter your choice:
7
Sugar
   The value returned is=0

Enter your choice:
8
Tea
   The value returned is=0

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
-5
   The value returned is=0

Enter your choice:
3

Insert_Small_Cups(int n)
Enter value of n
2
    The value returned is=0

Enter your choice:
1
Set_Price(int p)
Enter value of p
5
    The value returned is =0

Enter your choice:
1
Set_Price(int p)
Enter value of p
-5
    The value returned is =0

Enter your choice:
9
Cancel
    The value returned is=0

Enter your choice:
10
Dispose
    The value returned is=0

    "Test Case Passed".

- Test Case #31:

Enter your choice:
1
Set_Price(int p)
Enter value of p
15
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar

The value returned is=1

Enter your choice:
8
Tea
The value returned is=0

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
The value returned is=0

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
The value returned is=0

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
-5
The value returned is=0

Enter your choice:
1
Set_Price(int p)
Enter value of p
5
The value returned is =0

Enter your choice:
10
Dispose
The value returned is=0

Enter your choice:
9
Cancel
RETURN COINS
The value returned is=1

Enter your choice:

10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed".

- Test Case #32:

Enter your choice:
1
Set_Price(int p)
Enter value of p
15
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
8
Tea
    The value returned is=0

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=0

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
    The value returned is=0

1
Set_Price(int p)
Enter value of p
5
    The value returned is =0

Enter your choice:
10

Dispose
    The value returned is=0

Enter your choice:
9
Cancel
RETURN COINS
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed".

- Test case #33:

Enter your choice:
1
Set_Price(int p)
Enter value of p
15
    The value returned is =1

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
8
Tea
    The value returned is=0

Enter your choice:
10
Dispose
    The value returned is=0

- Test Case #34:

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
8
Tea
    The value returned is=0

Enter your choice:
9
Cancel
RETURN COINS
    The value returned is=1

Enter your choice:

10
Dispose
SHUT DOWN
    The value returned is=1

    "Test Case Passed".

- Test Case #35:

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
8
Tea
    The value returned is=0

Enter your choice:
9
Cancel
RETURN COINS
    The value returned is=1

Enter your choice:
10
Dispose

SHUT DOWN
    The value returned is=1

    "Test Case Passed".

- Test Case #36:

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
7
Sugar
    The value returned is=1

Enter your choice:
5
Small_Cup
    The value returned is=1

Enter your choice:
8
Tea
    The value returned is=0

Enter your choice:
9
Cancel
RETURN COINS
    The value returned is=1

Enter your choice:

10
Dispose
SHUT DOWN
 The value returned is=1

 "Test Case Passed".

- Test Case #37:

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
 The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
 The value returned is =1

Enter your choice:
4
Coin
 The value returned is=1

Enter your choice:
5
Small_Cup
 The value returned is=1

Enter your choice:
8
Tea
 The value returned is=0

Enter your choice:
9
Cancel
RETURN COINS
 The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN

The value returned is=1

"Test Case Passed".

- Test Case #38:

Enter your choice:
2
Insert_Large_Cups(int n)
Enter value of n
1
The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
The value returned is =1

Enter your choice:
4
Coin
The value returned is=1

Enter your choice:
7
Sugar
The value returned is=1

Enter your choice:
5
Small_Cup
The value returned is=1

Enter your choice:
8
Tea
The value returned is=0

Enter your choice:
9
Cancel
RETURN COINS
The value returned is=1

Enter your choice:
10

Dispose
SHUT DOWN
    The value returned is=1

    "Test case Passed".

- Test Case #39:

Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
1
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
8
Tea
    The value returned is=0

Enter your choice:
9
Cancel
RETURN COINS
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN

The value returned is=1

"Test Case Passed".

- Test Case #40:

```
Enter your choice:
3
Insert_Small_Cups(int n)
Enter value of n
5
    The value returned is=1

Enter your choice:
1
Set_Price(int p)
Enter value of p
10
    The value returned is =1

Enter your choice:
4
Coin
    The value returned is=1

Enter your choice:
6
Large_Cup
    The value returned is=1

Enter your choice:
8
Tea
    The value returned is=0

Enter your choice:
9
Cancel
RETURN COINS
    The value returned is=1

Enter your choice:
10
Dispose
SHUT DOWN
    The value returned is=1
```

"Test Case Passed".

6. Conclusions:

The Vending Machine had 5 different states : Idle, Coins Inserted, Sugar, no_small_cups, no_large_cups. The incoming and outgoing transitions has been identified for all the states and even transition pairs has been formed as well. Through testing we found out that some of the transition pairs belonging to different states are not executable. Also ghost transition testing enables to test the non reachable test cases. All the possible combinations of outcomes of conditions in a decision are tested through Multiple condition testing in which some of the conditions were not possible.

7. Source Code

Vending Machine.java

```java
public class VendingMachine
{
    private int x;
    private int price;
    private int k;
    private int k1;
    private int t;
    private int s;

    public VendingMachine()
    {
      k1 = 0;
      k = 0;
      t = 0;
      price = 0;
      x = 1;
    }
    public final int coin()
    {
      if (x == 1)
      {
              if ((t + 25 >= price) && (price > 0))
              {
                      s = 0;
                      t = 0;
                      x = 2;
                      return 1;
              }
              else if (t + 25 < price)
              {
                      t = t + 25;
                      return 1;
```

```java
                }
        }
        else if ((x > 1) && (x < 6))
        {
                System.out.print("RETURN COIN");
                System.out.print("\n");
                return 1;
        }
        return 0;
}
public final int small_cup()
{
    if ((x == 2) || (x == 3))
    {
                s = 2;
                return 1;
    }
    return 0;
}
public final int large_cup()
{
    if ((x == 2) || (x == 3))
    {
                s = 1;
                return 1;
    }
    return 0;
}
public final int sugar()
{
    if ((x == 2) || (x == 3))
    {
                if (x == 2)
                {
                        x = 3;
                }
                else
                {
                        x = 2;
                }
                return 1;
    }
    return 0;
}
public final int tea()
{
    if ((x == 2) || (x == 3))
    {
```

```java
if ((x == 2) && (k1 > 1) && (s == 2))
{
        System.out.print("DISPOSE SMALL CUP OF TEA");
        System.out.print("\n");
        k1 = k1 - 1;
        x = 1;
        return 1;
}
else if ((x == 2) && (k > 1) && (s == 1))
{
        System.out.print("DISPOSE LARGE CUP OF TEA");
        System.out.print("\n");
        k = k - 1;
        x = 1;
        return 1;
}
else if ((x == 2) && (k == 1) && (s == 1))
{
        System.out.print("DISPOSE LARGE CUP OF TEA");
        System.out.print("\n");
        k = k - 1;
        x = 5;
        return 1;
}
else if ((x == 2) && (k1 == 1) && (s == 2))
{
        System.out.print("DISPOSE SMALL CUP OF TEA");
        System.out.print("\n");
        k1 = k1 - 1;
        x = 4;
        return 1;
}
else if ((x == 3) && (k1 == 1) && (s == 2))
{
        System.out.print("DISPOSE SMALL CUP OF TEA WITH SUGAR");
        System.out.print("\n");
        k1 = k1 - 1;
        x = 4;
        return 1;
}
else if ((x == 3) && (k == 1) && (s == 1))
{
        System.out.print("DISPOSE LARGE CUP OF TEA WITH SUGAR");
        System.out.print("\n");
        k = k - 1;
        x = 5;
        return 1;
}
```

```java
                if ((x == 3) && (k1 > 1) && (s == 2))
                {
                        System.out.print("DISPOSE SMALL CUP OF TEA WITH SUGAR");
                        System.out.print("\n");
                        k1 = k1 - 1;
                        x = 1;
                        return 1;
                }
                else if ((x == 3) && (k > 1) && (s == 1))
                {
                        System.out.print("DISPOSE LARGE CUP OF TEA WITH SUGAR");
                        System.out.print("\n");
                        k = k - 1;
                        x = 1;
                        return 1;
                }
                return 0;
    }
    return 0;
}
public final int insert_large_cups(int n)
{
    if ((x == 1) && (n > 0))
    {
            k = k + n;
            return 1;
    }
    else if ((x == 5) && (n > 0))
    {
            k = n;
            x = 1;
            return 1;
    }
    return 0;
}
public final int insert_small_cups(int n)
{
    if ((x == 1) && (n > 0))
    {
            k1 = k1 + n;
            return 1;
    }
    else if ((x == 4) && (n > 0))
    {
            k1 = n;
            x = 1;
            return 1;
    }
```

```java
    return 0;
}
public final int set_price(int p)
{
  if ((x == 1) && (p > 0))
  {
          price = p;
          return 1;
  }
  return 0;
}
public final int cancel()
{
  if ((x == 2) || (x == 3))
  {
          System.out.print("RETURN COINS");
          System.out.print("\n");
          x = 1;
          return 1;
  }
  return 0;
}
public final int dispose()
{
  if ((x == 1))
  {
          System.out.print("SHUT DOWN");
          System.out.print("\n");
          x = 6;
          return 1;
  }
  return 0;
}

void Show_State(){
  System.out.println("");
  if(x==1){
          System.out.println("State : Idle");
  }else if(x==2){
          System.out.println("State : Coin Inserted");
  }else if(x==3){
          System.out.println("State : Sugar");
  }else if(x==4){
          System.out.println("State : no_Large_Cups");
  }else if(x==5){
          System.out.println("State : no_Small_Cups");
  }
  System.out.println("");
```

```java
        }

        void Show_All_Values(){
          System.out.println("Price="+price);
          System.out.println("No_of_Large_Cups="+k);
          System.out.println("No_of_small_Cups="+k1);
          System.out.println("T="+t);
          System.out.println("CurrentState="+x);
        }
        }


        Vending Machine Driver.java

import java.io.*;
import java.util.Scanner;


public class VendingMachineDriver
{
  public static void main(String [] args)
  {

      int ch=0;
      int r=-1;
      int n;

      VendingMachine obj=new VendingMachine();
      Scanner in = new Scanner(System.in);


      while(ch!=11){


        System.out.println("1.Set_Price");
        System.out.println("2.Insert_Large_Cups");
        System.out.println("3.Insert_Small_Cups");
        System.out.println("4.Coin");
        System.out.println("5.Small_Cup");
        System.out.println("6.Large_Cup");
        System.out.println("7.Sugar");
        System.out.println("8.Tea");
        System.out.println("9.Cancel");
        System.out.println("10.Dispose");
        System.out.println("11.Quit");
        System.out.println("12.Show_state");
        System.out.println("13.Show_All_Values");
        System.out.println("");
```

```java
System.out.println("Enter your choice:");
ch=in.nextInt();

switch(ch){
case 1:
        int price;
        System.out.println("Set_Price(int p)");
        System.out.println("Enter value of p");
        price=in.nextInt();

        r=obj.set_price(price);
        System.out.println("The value returned is ="+ r);
        break;
case 2:
        System.out.println("Insert_Large_Cups(int n)");
        System.out.println("Enter value of n");
        n=in.nextInt();

        r=obj.insert_large_cups(n);
        System.out.println("The value returned is="+r);
        break;
case 3:
        System.out.println("Insert_Small_Cups(int n)");
        System.out.println("Enter value of n");
        n=in.nextInt();

        r=obj.insert_small_cups(n);
        System.out.println("The value returned is="+r);
        break;
case 4:
        System.out.println("Coin");
        r=obj.coin();
        System.out.println("The value returned is="+r);
        break;
case 5:
        System.out.println("Small_Cup");
        r=obj.small_cup();
        System.out.println("The value returned is="+r);
        break;
case 6:
        System.out.println("Large_Cup");
        r=obj.large_cup();
        System.out.println("The value returned is="+r);
        break;
case 7:
        System.out.println("Sugar");
        r=obj.sugar();
        System.out.println("The value returned is="+r);
```

```
                break;
        case 8:
                System.out.println("Tea");
                r=obj.tea();
                System.out.println("The value returned is="+r);
                break;
        case 9:
                System.out.println("Cancel");
                r=obj.cancel();
                System.out.println("The value returned is="+r);
                break;
        case 10:
                System.out.println("Dispose");
                r=obj.dispose();
                System.out.println("The value returned is="+r);
                break;
        case 12:
                System.out.println("Show_State");
                obj.Show_State();
                break;
        case 13:
                System.out.println("Show_All_Values");
                obj.Show_All_Values();
                break;
        default:
                if(ch!=11){
                System.out.println("Please choose only from the given options!!");
                System.out.println("Else Enter 11 to quit");
                }
                        break;
        }
        System.out.println("");
        System.out.println("");

    }

    System.out.println("VendingMachine Driver is Stopped");
    System.exit(0);
}
  }
```