Project 4

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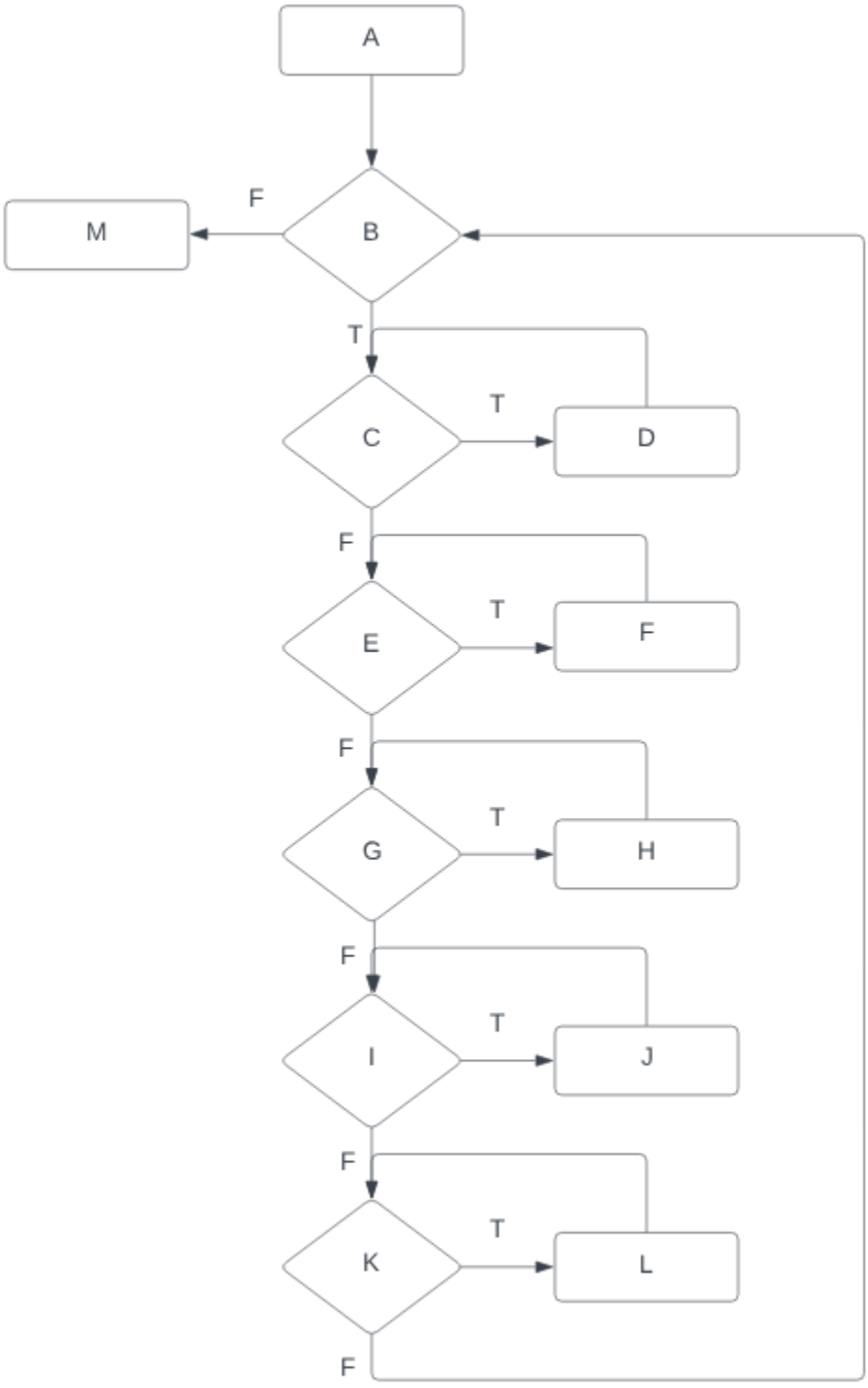
Code Graph:



Orthogonal Array:

I have opted to utilize an orthogonal array in combination with the code graph to optimize path testing. The array is pairwise with five factors and two levels. The five factors represent blocks C, E, G, I, and K. The two levels represent true or false. This array makes up for case 1-8.

Case #	**C**	**E**	**G**	**I**	**K**
1 x	1	1	1	1	1
2 x	1	1	1	0	0
3	1	0	0	1	1
4 x	1	0	0	0	0
5	0	1	0	1	0
6	0	1	0	0	1
7	0	0	1	1	0
8 x	0	0	1	0	1

Test Cases:

Case #1 (A B C D C E F E G H G I J I K L K B M)

Preconditions: Current BAL = 2.00, B7 = 0.35, 15 $1 coins, 1 quarter, 15 dimes, and 15 nickels.

Input	Expected Output	Actual Output	P/F
B	Display: B		
7	[Turn B7 Crank] Display: Vending B7 [Stop B7 Crank] Display: BAL = 1.65 [Dispense $1 coin] Display: BAL = 0.65 [Dispense 25¢] Display: BAL = 0.40 [Dispense 10¢] Display: BAL = 0.30 [Dispense 10¢] Display: BAL = 0.20 [Dispense 5¢] Display: BAL = 0.15 [Dispense 10¢] Display: BAL = 0.05 [Dispense 5¢] Display: BAL = 0.00		

Case #2 (A B C D C E F E G H G I K B M)

Preconditions: Current BAL = 3.00, D2 = 1.50, 15 $1 coins, 1 quarter, 15 dimes, and 15 nickels.

Input	Expected Output	Actual Output	P/F
D	Display: D		
2	[Turn D2 Crank] Display: Vending D2 [Stop D2 Crank] Display: BAL = 1.50 [Dispense $1 coin] Display: BAL = 0.50 [Dispense 25¢] Display: BAL = 0.25 [Dispense 10¢] Display: BAL = 0.15 [Dispense 10¢] Display: BAL = 0.05 [Dispense 5¢] Display: BAL = 0.00		

Case #3 (A B C D C E G I J I K L K B M)

Preconditions: Current BAL = 2.00, E2 = 0.85, 15 $1 coins, 15 quarters, 15 dimes, and 15 nickels.

Input	Expected Output	Actual Output	P/F
E	Display: E		
2	[Turn E2 Crank] Display: Vending E2 [Stop E2 Crank] Display: BAL = 1.15 [Dispense $1 coin] Display: BAL = 0.15 [Dispense 10¢] Display: BAL = 0.05 [Dispense 5¢] Display: BAL = 0.00		

Case #4 (A B C D C E G I K B M)

Preconditions: Current BAL = 2.00, D0 = 1.00, 15 $1 coins, 15 quarters, 15 dimes, and 15 nickels.

Input	Expected Output	Actual Output	P/F
D	Display: D		
0	[Turn D0 Crank] Display: Vending D0 [Stop D0 Crank] Display: BAL = 1.00 [Dispense $1 coin] Display: BAL = 0.00		

Case #5 (A B C E F E G I J I K B M)

Preconditions: Current BAL = 2.00, D9 = 1.65, 15 $1 coins, 15 quarters, 15 dimes, and 15 nickels.

Input	Expected Output	Actual Output	P/F
D	Display: D		
9	[Turn D9 Crank] Display: Vending D9 [Stop D9 Crank] Display: BAL = 0.35 [Dispense 25¢] Display: BAL = 0.10 [Dispense 10¢] Display: BAL = 0.00		

Case #6 (A B C E F E G I K L K B M)

Preconditions: Current BAL = 0.50, B5 = 0.20, 15 $1 coins, 15 quarters, 15 dimes, and 15 nickels.

Input	Expected Output	Actual Output	P/F
B	Display: B		
5	[Turn B5 Crank] Display: Vending B5 [Stop B5 Crank] Display: BAL = 0.30 [Dispense 25¢] Display: BAL = 0.05 [Dispense 5¢] Display: BAL = 0.00		

Case #7 (A B C E G H G I J I K B M)

Preconditions: Current BAL = 2.00, D9 = 1.65, 15 $1 coins, 0 quarters, 15 dimes, and 15 nickels.

Input	Expected Output	Actual Output	P/F
D	Display: D		
9	[Turn D9 Crank] Display: Vending D9 [Stop D9 Crank] Display: BAL = 0.35 [Dispense 10¢] Display: BAL = 0.25 [Dispense 10¢] Display: BAL = 0.15 [Dispense 5¢] Display: BAL = 0.10 [Dispense 10¢] Display: BAL = 0.00		

Case #8 (A B C E G H G I K L K B M)

Preconditions: Current BAL = 0.50, B5 = 0.20, 15 $1 coins, 0 quarters, 15 dimes, and 15 nickels.

Input	Expected Output	Actual Output	P/F
B	Display: B		
5	[Turn B5 Crank] Display: Vending B5 [Stop B5 Crank] Display: BAL = 0.30 [Dispense 10¢] Display: BAL = 0.20 [Dispense 10¢] Display: BAL = 0.10 [Dispense 5¢] Display: BAL = 0.05 [Dispense 5¢] Display: BAL = 0.00		

Case #9 (A B M)

Preconditions: Current BAL = 1.00, D0 = 1.00, 15 $1 coins, 15 quarters, 15 dimes, and 15 nickels.

Input	Expected Output	Actual Output	P/F
D	Display: D		
0	[Turn D0 Crank] Display: Vending D0 [Stop D0 Crank] Display: BAL = 0.00		

Regression Test Plan Additions:

Case #1, #3, #6 and #7

Example Run:

Case #1 (A B C D C E F E G H G I J I K L K B M)

Preconditions: Current BAL = 2.00, B7 = 0.35, 15 $1 coins, 1 quarter, 15 dimes, and 15 nickels.

Input	Expected Output	Actual Output	P/F
B	Display: B	Display: B	P
7	[Turn B7 Crank] Display: Vending B7 [Stop B7 Crank] Display: BAL = 1.65 [Dispense $1 coin] Display: BAL = 0.65 [Dispense 25¢] Display: BAL = 0.40 [Dispense 10¢] Display: BAL = 0.30 [Dispense 10¢] Display: BAL = 0.20 [Dispense 5¢] Display: BAL = 0.15 [Dispense 10¢] Display: BAL = 0.05 [Dispense 5¢] Display: BAL = 0.00	[Turn B7 Crank] Display: VENDING B7 [Stop B7 Crank] Display: BAL = 1.65 [Dispense $1 coin] Display: BAL = 0.65 [Dispense 25¢] Display: BAL = 0.40 [Dispense 10¢] Display: BAL = 0.30 [Dispense 10¢] Display: BAL = 0.20 [Dispense 5¢] Display: BAL = 0.15 [Dispense 10¢] Display: BAL = 0.05 [Dispense 5¢] Display: BAL = 0.00	P

```
> B
Display: B
> 7
[Turn B7 Crank]
Display: VENDING B7
[Stop B7 Crank]
Display: BAL = 1.65
[Dispense $1 coin]
Display: BAL = 0.65
[Dispense 25¢]
Display: BAL = 0.40
[Dispense 10¢]
Display: BAL = 0.30
[Dispense 10¢]
Display: BAL = 0.20
[Dispense 5¢]
Display: BAL = 0.15
[Dispense 10¢]
Display: BAL = 0.05
[Dispense 5¢]
Display: BAL = 0.00
>
```

Case #3 (A B C D C E G I J I K L K B M)

Preconditions: Current BAL = 2.00, E2 = 0.85, 15 $1 coins, 15 quarters, 15 dimes, and 15 nickels.

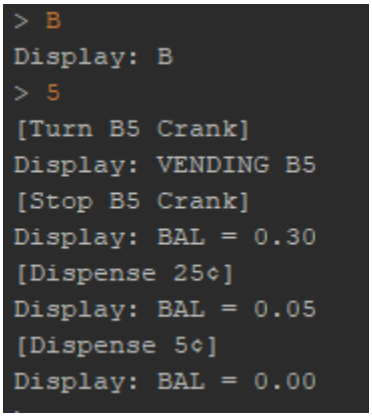
Input	Expected Output	Actual Output	P/F
E	Display: E	Display: E	P
2	[Turn E2 Crank] Display: Vending E2 [Stop E2 Crank] Display: BAL = 1.15 [Dispense $1 coin] Display: BAL = 0.15 [Dispense 10¢] Display: BAL = 0.05 [Dispense 5¢] Display: BAL = 0.00	[Turn E2 Crank] Display: VENDING E2 [Stop E2 Crank] Display: BAL = 1.15 [Dispense $1 coin] Display: BAL = 0.15 [Dispense 10¢] Display: BAL = 0.05 [Dispense 5¢] Display: BAL = 0.00	P

```
> E
Display: E
> 2
[Turn E2 Crank]
Display: VENDING E2
[Stop E2 Crank]
Display: BAL = 1.15
[Dispense $1 coin]
Display: BAL = 0.15
[Dispense 10¢]
Display: BAL = 0.05
[Dispense 5¢]
Display: BAL = 0.00
```

Case #6 (A B C E F E G I K L K B M)

Preconditions: Current BAL = 0.50, B5 = 0.20, 15 $1 coins, 15 quarters, 15 dimes, and 15 nickels.

Input	Expected Output	Actual Output	P/F
B	Display: B	Display: B	P
5	[Turn B5 Crank] Display: Vending B5 [Stop B5 Crank] Display: BAL = 0.30 [Dispense 25¢] Display: BAL = 0.05 [Dispense 5¢] Display: BAL = 0.00	[Turn B5 Crank] Display: Vending B5 [Stop B5 Crank] Display: BAL = 0.30 [Dispense 25¢] Display: BAL = 0.05 [Dispense 5¢] Display: BAL = 0.00	P



Case #7 (A B C E G H G I J I K B M)

Preconditions: Current BAL = 2.00, D9 = 1.65, 15 $1 coins, 0 quarters, 15 dimes, and 15 nickels.

Input	Expected Output	Actual Output	P/F
D	Display: D	Display: D	P
9	[Turn D9 Crank] Display: Vending D9 [Stop D9 Crank] Display: BAL = 0.35 [Dispense 10¢] Display: BAL = 0.25 [Dispense 10¢] Display: BAL = 0.15 [Dispense 5¢] Display: BAL = 0.10 [Dispense 10¢] Display: BAL = 0.00	[Turn D9 Crank] Display: Vending D9 [Stop D9 Crank] Display: BAL = 0.35 [Dispense 10¢] Display: BAL = 0.25 [Dispense 10¢] Display: BAL = 0.15 [Dispense 5¢] Display: BAL = 0.10 [Dispense 10¢] Display: BAL = 0.00	P

```
> D
Display: D
> 9
[Turn D9 Crank]
Display: VENDING D9
[Stop D9 Crank]
Display: BAL = 0.35
[Dispense 10¢]
Display: BAL = 0.25
[Dispense 10¢]
Display: BAL = 0.15
[Dispense 5¢]
Display: BAL = 0.10
[Dispense 10¢]
Display: BAL = 0.00
```

Code Blocks:

```
double balanceAmt = mach.amtDep-itemCost;  // Block A
if (balanceAmt > 0) { // Block B
            // Block C
            while (balanceAmt >= 1.00 && mach.numDollarCoins > 0) {
            //Block D
            //return a dollar coin
            dispense_coins (1,0,0,0);
            balanceAmt -= 1.00;
            System.out.println("Balance = " + balanceAmt);
            mach.numDollarCoins -= 1;
      }
            //Block E
            //if machine runs out of dollar coins, use quarters
            while (balanceAmt >= 0.25 && mach.numQuarters > 0) {
            //Block F
            dispense_coins (0,1,0,0);
            balanceAmt -= 0.25;
            System.out.println("Balance = " + balanceAmt);
            mach.numQuarters -= 1;
      }
            // Block G
            //in case machine runs out of quarters
            while (balanceAmt >= 0.25 && mach.numQuarters == 0 &&
            //Block H
            mach.numDimes >= 2 && mach.numNickels > 0) {
            dispense_coins (0,0,2,1);
            balanceAmt -= 0.25;
            System.out.println("Balance = " + balanceAmt);
            mach.numDimes -= 2;
            mach.numNickels -= 1;
      }
            // Block I
            while (balanceAmt >= 0.10 && mach.numDimes > 0) {
            //Block J
            dispense_coins (0,0,1,0);
            balanceAmt -= 0.10;
            System.out.println("Balance = " + balanceAmt);
            mach.numDimes -= 1;
      }
            // Block K
            while (balanceAmt >= 0.05 && mach.numNickels > 0) {
            //Block L
            dispense_coins (0,0,0,1);
            balanceAmt -= 0.05;
            System.out.println("Balance = " + balanceAmt);
            mach.numNickels -= 1;
      }
} //end change return routine // Block M
```