Pay As You Go Challenge – May 2020

A mathematical approach was used to solve this problem. Few more data points were calculated from the input values to determine the starting tier and units to split. Using the starting tier and units to split, the tier 1, 2 and 3 values were calculated. As an additional feature, the FreeUnits, Tier1UnitsLimit, Tier2UnitsLimit and Tier3UnitsLimits were treated as variables so, the rules will not be modified if those limits are changed. Sparkling Logic's SMARTS and Rulesmatix LABS Testing Framework were used to develop and test the solution respectively.

Data Points Added:

- UsedFreeUnits = Min(AllUnits-ThisMonthUnits, FreeUnits)
- ThisMonthsFreeUnits = FreeUnits-UsedFreeUnits
- UnitsBeforeThisHour = ThisMonthUnits-LastHourUnits
- FreeUnitsThisHour = Minimum of:
    - LastHourUnits
    - If (ThisMonthsFreeUnits-UnitsBeforeThisHour>0)
        - Min(LastHourUnits, ThisMonthsFreeUnits-UnitsBeforeThisHour)
    - Else
        - 0
- UnitsToSplit = LastHourUnits-FreeUnitsThisHour
- StartingTier = 1 , 2 or 3 depending on UnitsBeforeThisHour were within Tier 1, 2 or 3 limits
    - StartingTier = (UnitsBeforeThisHour<=Tier1UnitsLimit?1:(UnitsBeforeThisHour<=Tier2UnitsLimit?2:3))

Rules Created:

- Tier 1 Rule
    - if
        - StartingTier == 1 and UnitsToSplit > 0
    - then
        - Tier1Units = Min(Tier1UnitsLimit-UnitsBeforeThisHour, Min(Min(UnitsToSplit, Tier1UnitsLimit), FreeUnits));
        - UnitsToSplit -= Tier1Units;
        - StartingTier ++;

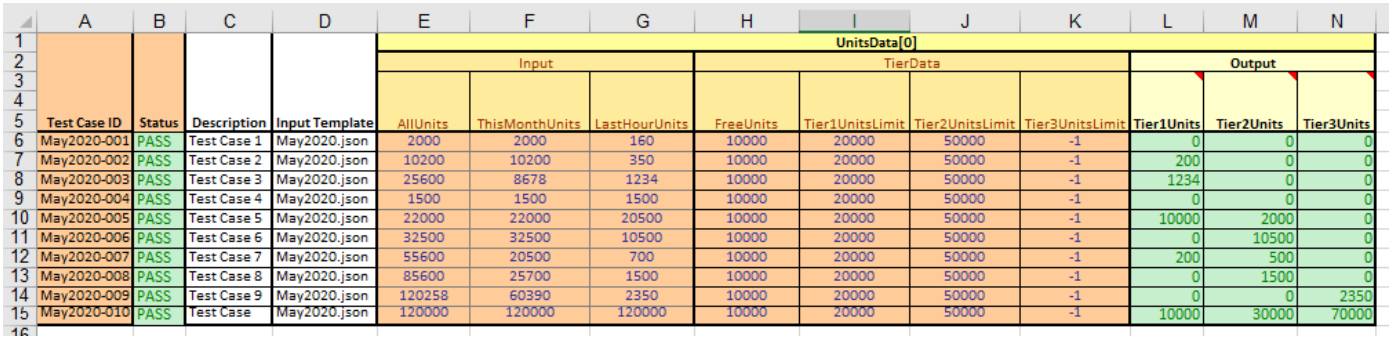
- Tier 2 Rule
    - if
        - StartingTier == 2 and UnitsToSplit > 0
    - then
        - Tier2Units = Min(UnitsToSplit, Tier2UnitsLimit-Tier1UnitsLimit);
        - UnitsToSplit -= Tier2Units;
        - StartingTier ++;

- Tier 3 Rule

- if
  - StartingTier == 3 and UnitsToSplit > 0
- then
  - Tier3Units = UnitsToSplit

Testing

Following is a screen snap shot of the test cases showing all test cases passed:



				UnitsData[0]									
				Input			TierData				Output		
Test Case ID	Status	Description	Input Template	AllUnits	ThisMonthUnits	LastHourUnits	FreeUnits	Tier1UnitsLimit	Tier2UnitsLimit	Tier3UnitsLimit	Tier1Units	Tier2Units	Tier3Units
May2020-001	PASS	Test Case 1	May2020.json	2000	2000	160	10000	20000	50000	-1	0	0	0
May2020-002	PASS	Test Case 2	May2020.json	10200	10200	350	10000	20000	50000	-1	200	0	0
May2020-003	PASS	Test Case 3	May2020.json	25600	8678	1234	10000	20000	50000	-1	1234	0	0
May2020-004	PASS	Test Case 4	May2020.json	1500	1500	1500	10000	20000	50000	-1	0	0	0
May2020-005	PASS	Test Case 5	May2020.json	22000	22000	20500	10000	20000	50000	-1	10000	2000	0
May2020-006	PASS	Test Case 6	May2020.json	32500	32500	10500	10000	20000	50000	-1	0	10500	0
May2020-007	PASS	Test Case 7	May2020.json	55600	20500	700	10000	20000	50000	-1	200	500	0
May2020-008	PASS	Test Case 8	May2020.json	85600	25700	1500	10000	20000	50000	-1	0	1500	0
May2020-009	PASS	Test Case 9	May2020.json	120258	60390	2350	10000	20000	50000	-1	0	0	2350
May2020-010	PASS	Test Case	May2020.json	120000	120000	120000	10000	20000	50000	-1	10000	30000	70000