**Tracing The Algorithm:-**

**1)User and Daily Basis:-**

**Consider the Input data**

**Planned Schedule**

**u1 Hyd Mail 2020-06-13T 9:00 12:00 Work**

**u1 Hyd Mail 2020-06-13T 12:00 13:00 Lunch**

**u1 Hyd Mail 2020-06-13T 13:00 17:00 Work**

**Actual Schedule**

**u1 Hyd Mail 2020-06-13T 9:30 12:30 Work**

**u1 Hyd Mail 2020-06-13T 12:30 13:30 Lunch**

**u1 Hyd Mail 2020-06-13T 13:30 17:00 Work**

**First processing of input files will be done and data will be uploaded into dynamodb tables.**

**Both the actual and planned arrays will be initialised with zero.**

**In planned schedule**

**from index 540 to 720 value will be updated to one.**

**from 780 to 1020 value will be updated to one.**

**In actual schedule**

**from index 570 to 750 value will be updated to one.**

**from 810 to 1050 value will be updated.**

**total deviation is sum of absolute difference of value at each index=30+30+30=90minutes.**

**Hence the deviation of every user can be generated and the output file will contain a continuous deviation over a period of time for every user on daily basis.**

**2. User and Weekly basis :-**

**Consider the same input data for the whole week from 2020-06-01 to 2020-06-07.**

**The deviation of this user For entire week is 630 i.e.sum of deviation of each day.**

**Average deviation of week is 630 minutes/7=90 minutes.**

**for calculating the deviation of week 2020-06-02 to 2020-06-08 naive approach would be calculating the deviation for each day of week .**

**Optimised approach is including deviation of 2020-06-08 into previously calculated deviation and excluding the deviation of 2020-06-01 .**

**3. User and Monthly Basis :-**

**Consider the same data from 2020-06-01 to 2020 -06-30**

**the entire deviation for the month is 2700 minutes.**

**average deviation of u1 on monthly basis is 90 minutes.**

**Similarly deviation from 2020-07-01 -2020-06-02 can be calculated on monthly basis by including 2020-07-01 and excluding 2020-06-01 .**

**Continuous data for average monthly deviation will be obtained.**

**For calculating deviation on Site basis we have to include deviation of every user belonging to the site.**

**for example**

**Planned Schedule**

**u1 Hyd Mail 2020-06-13T 9:00 12:00 Work**

**u1 Hyd Mail 2020-06-13T 12:00 13:00 Lunch**

**u1 Hyd Mail 2020-06-13T 13:00 17:00 Work**

**u2 Hyd Mail 2020-06-13T 9:00 12:00 Work**

**u2 Hyd Mail 2020-06-13T 12:00 13:00 Lunch**

**u2 Hyd Mail 2020-06-13T 13:00 17:00 Work**

**Actual Schedule**

**u1 Hyd Mail 2020-06-13T 9:30 12:30 Work**

**u1 Hyd Mail 2020-06-13T 12:30 13:30 Lunch**

**u1 Hyd Mail 2020-06-13T 13:30 17:00 Work**

**u2 Hyd Mail 2020-06-13T 9:30 12:30 Work**

**u2 Hyd Mail 2020-06-13T 12:30 13:30 Lunch**

**u2 Hyd Mail 2020-06-13T 13:30 17:30 Work**

**deviation of u1=90minutes.**

**deviation of u2=120minutes.**

**deviation of Hyd site=210minutes.**

**similarly monthly and weekly basis can be calculated.**

**Same Applies for WorkGroup and Interval level.**