Please attempt this question and come up with a solution: Write code in Python without using any external libraries for the below problem. Typical response time is 2hrs, but there is no time limit as such.

Test Problem

Q.) Consider a loan of amount (A) taken by a borrower.

Interest is charged on the loan when specific conditions are applicable.

There are a set of n conditions defined with the loan.

Each condition is associated with a specific interest rate (R_n).

Each condition is applicable during a single specified period (from S_n Date to E_n Date both inclusive).

The periods across conditions can overlap.

Simple Interest is charged on the amount of the loan for that period.

The interest is computed as simple interest (Principal * Time * Rate) –

$= A * (E_n - S_n + 1) * R_n / 365$

Since the condition periods can overlap, more than one condition can be applicable on the same day, in which case sum of condition Interest Rates (R_n) will be applicable for that period.

There is a Cap on maximum rate that can be charged on any day (z% per annum).

Once the Total interest is computed it is attributed condition-wise proportional to the respective Interest Rate (R_n).

Write a function in Python (without using any external libraries) which takes A, z and n conditions with single applicable period (S_n Date to E_n Date) and Interest Rate, R_n for each condition as input arguments and prints the following -

a) Total Interest

b) Breakup of Total Interest Condition-wise

Let us take an example purely for illustration purposes -

A = 100

Condition 1 - Interest 2% (R_1) per annum
Condition 2 - Interest 3% (R_2) per annum
z = 4%

Let's assume Condition 1 is applicable for period 10-Jan-20 (S_1) to 20-Jan-20 (E_1).

The interest applicable is calculated as simple interest --> $A * (E1 - S1 + 1) * R1 / 365$

Total Interest = $100 * (20 - 10 + 1) * 2\% / 365$

But if Condition 2 is also applicable for period 15-Jan-20 (S_2) to 25-Jan-20 (E_2) then interest

Period 1: 10-Jan-20 to 14-Jan-20   --> $A * (E - S + 1) * (R_1) / 365$

$CP_1 = 100 * (14-10+1) * 2\% / 365$

Period 2: 15-Jan-20 to 20-Jan-20   --> $A * (E - S + 1) * (R_1 + R_2) / 365$
= $100 * (20-15+1) * (2\%+3\%) / 365$

However, since there is a cap on rate, 5% will be capped to 4% (z) -->

$CP_2 = 100 * (20-15+1) * (4\%) / 365$

Period 3: 21-Jan-20 to 25-Jan-20   --> $A * (E - S + 1) * (R_2) / 365$
$CP_3 = 100 * (25-21+1) * 3\% / 365$

Total Interest = $CP_1 + CP_2 + CP_3$

The total interest can be broken up into individual components in proportion of the Condition rate –

a) During Period 1 the entire charge is due to Condition 1 = CP_1

b) During Period 2 charge will be distributed proportionally (as per condition rate) between Condition 1 and Condition 2.
Part of Condition 1 = $2/5 * CP_2$
Part of Condition 2 = $3/5 * CP_2$

c) During Period 3 the entire interest is due to Condition 2 = CP_3

So, Breakup condition wise –

Condition 1 Charge = $CP_1 + 2/5 * CP_2$

Condition 2 Charge = $3/5 * CP_2 + CP_3$

Note:

· This example is only for illustration purposes and should not be part of the solution.
· More than 2 condition periods can also overlap.
· Condition periods are not in any given order (not in ascending order)

Please email your response to :

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 Also while sharing the task kindly rename the submission with your full name