Assignment 1 - Part C - Greedy Approach

August 9, 2023
Deadline: August 14, 2023, 2 pm
Input format:
<Number of presentations (N)> <Divisions in Greedy Approach (**K**)>
<Start time in HHMM format> <End time in HHMM format> <Popularity score>
<String containing presentation title>

Example:
5 3
0900 1000 8 p1
0930 1030 6 p2
1000 1100 7 p3
1030 1130 9 p4
1100 1200 5 p5

Output format:
Print the list of selected presentations in one presentation per line, along with their starting times, ending times, popularity scores and presentation titles. Please also report the **maximum total popularity score** of the selected presentations.

Algorithm:
1. "K" denotes the number of timeline divisions, which is taken as a user input
2. Sort the "N" presentations in non-decreasing order of ending time. Let the sorted order of presentations be *p1, p2, …, pN*
3. Initialize "timeline_start" as the starting time of p1 and "timeline_end" as the ending time of pN.
4. Initialize "bestGreedySum" as 0
5. Iterate until K == 1 is True:
    a) Divide the current timeline (from timeline_start to timeline_end) into "K" equal parts.
    b) Select the presentation (say, *pKBest*) that completely lies within the K-th part (last part) with the highest popularity score.
    c) bestGreedySum = bestGreedySum + popularity score of pKBest.
    d) timeline_end = starting time of *pKBest*.
    e) K = K -1
6. When K = 1:
    a) Use the same algorithm used as Part B of August 7, 2023 assignment, i.e., sort the presentations by their popularity scores in descending order and then

iteratively select the presentation with the highest popularity score that does not conflict with any previously selected presentation.

b) Update *"bestGreedySum"* by adding the popularity score of the selected presentations

7. Output "bestGreedySum" as the **maximum total popularity score**.

Submission instructions:

1. Upload the C file named as <RollNo>_A1_PartC_Greedy.C
2. Upload a report with the following plot in the form of PDF named as <RollNo>_A1_PartC_Greedy_plot.pdf
   a) **X-axis**: Divisions in Greedy Approach (K in the above algorithm)
   b) **Y-axis:** Maximum total poularity score (bestGreedySum in the above algorithm)

Create a zip file of all these C files in the name <RollNo>_A1_PartC_Greedy.zip and submit it to Moodle before Monday class