

EEL 5733/4732 Advanced Systems Programming

Preliminary Assignment 1

This is not an assignment and so there is no due date. If you start working on the described programs, it will help you in implementing Assignment 1 as you'll have more time for implementing and debugging advanced topics.

Mapper program gets the input from a file that contains tuples in the form (userID, action, topic). userID is a 4-digit identification for the users of a social media site. Action can be one of the following letters: P for posting, L for liking, D for disliking, C for commenting, and S for sharing. Topic is a string of exactly 15 characters (shorter names will be padded with space). The mapper program processes these tuples to generate a weighted profile in the form (userID, topic, score) based on a set of rules, which are defined as P=50, L=20, D=-10, C=30, S=40. You can assume that the tuples are sorted according to userID field but tuples that belong to the same userID may not be sorted according to the topic. As an example, the input may look like

```
(1111,P,history), (1111,S,entertainment), (1111,L,history),(1111,L cosmetics), (2222,L,sports),  
(2222,S,sports), (3333, S, photography), (3333, L, art), (3333,P,art)
```

(note the omitted white space in topic names) and the correct output (on the standard output) would be

```
(1111,history,50), (1111,entertainment,40), (1111,history,20),(1111,cosmetics,20),  
(2222,sports,20), (2222,sports,40), (3333, photography,40), (3333, art,20), (3333,art,50)
```

Note that the Mapper program should output each tuple (userID, topic, score) as soon as it processes the corresponding (userID, action, topic) tuple. Also, each tuple should be output on a separate line (although shown in a condensed form above.)

Reducer program gets the tuples of the form (userID, topic, score) from the standard input and generates tuples of the form (userID, topic, total score) on the standard output as follows:

```
(1111,history,70)  
(1111,entertainment,40)  
(1111,cosmetics,20)  
(2222,sports,60)  
(3333,photography,40)  
(3333,art,70)
```

Like Mapper's input, tuples are sorted according to userID field but tuples that belong to the same userID may not be sorted according to the topic. Note that the Reducer outputs the tuple as soon as it realizes that there won't be any more tuples that belong to the same user. You can assume that the Reducer's input has a single tuple per line.

Make sure that Reducer detects the end of file character while reading from the standard input.