Software Development Fundamentals - CS1023
March-July 2022

Programming Assignment - shell scripts

This assignment needs to be done using shell scripts (bash). You can use any of the utilities discussed in the class to achieve the same.

Part-1: A file named "numbers.txt" is given to you which contains a few numbers in it, one number in each line. Write a script which takes this file as an input and prints the numbers in a cumulative format (the value at any line is the sum of the number in that line and all numbers before it) to another file named "cumulative.txt". For example, if the numbers are like the below:
2
15
24
8
25

The output should be:
2
17
41
49
74

Part-2: Another file "numbers_multicol.txt" is given which also contains numbers but has multiple entries per line (instead of one entry in the previous question). The numbers in each line are separated by ":" (colon). All lines have the same number of entries. Write a script which takes this file as an input and generates a cumulative sum separately for each column and keeps on writing it to a file "cumulative_multicol.txt". The input file might contain some lines which have a '#' in the beginning and these lines should be just ignored. For example, if the input file contains the following lines:
2:45:3:
3:4:7:
#10:12:34
4:8:90:

The output should be:
2:45:3:
5:49:10:
9:57:100:

Part-3: From the cse webpage (https://cse.iith.ac.in/people/btech/2021.html), we get the list of CSE 2021 BTech students. If we copy the content and paste it in a file, it looks like the attached "students.txt" file (a snippet shown below).

ABHAY SHANKAR K
CS21BTECH11001
ABHINAV YADAV
CS21BTECH11002
AKKASANI YAGNESH REDDY
CS21BTECH11003

This is not very convenient to read format and might lead to confusions. We would like to have something like the below (this can directly be read in the excel):
1;ABHAY SHANKAR K;CS21BTECH11001;cs21btech11001@iith.ac.in
2;ABHINAV YADAV;CS21BTECH11002;cs21btech11002@iith.ac.in
3;AKKASANI YAGNESH REDDY;CS21BTECH11003;cs21btech11003@iith.ac.in

Write a script to generate such a file (named "formatted_students.txt") from the given input file.

General guidelines for all problems:
1. Please strictly follow the file naming convention specified in the document (don't add spaces in filenames or change capitalization).
2. Verify your script for various cases as the files that we use for grading assignment might be different from what is provided to you.
3. The scripts for the three parts should have the names script1.sh, script2.sh, and script3.sh. You must clearly specify the arguments that need to be provided to the script, if any.
4. Prepare a document (maximum 2-page) explaining your implementation details and any specific learning from this assignment. Keep the file name as report.pdf. The report should be generated using Latex.
5. Create a zipfile named <studentIdnumber>.zip which should contain your scripts and report.pdf.

Weightage:
Part-1: 30%
Part-2: 30%
Part-3: 40%

Note: Your submissions might be subjected to plagiarism checks, so please submit your own work only.