CA6C1 – DevOps - National Insitute of Technology, Trichy
Assignment 1 – BASH & GIT
Announcement: 5 February 2025 9:00 PM ** Due: 20 February 2025 9:00 PM
Total Marks: 50 | Duration: 2 Weeks

Instructions: *This assignment is an individual submission, not a group activity. Evaluation will be conducted based on a fixed grading rubric (Syntax, Logic, Input and Output) and the marks are divided as per the prescribed weightage in respective question. Inputs/Outputs should fit the criteria mentioned in respective questions. Unless it is specified, all input/output criteria are open to interpretation. All questions in the assignment are self-explanatory. DO NOT reach us for any clarifications. If you are answering a question based on a certain assumption, please feel free to mention it as your code comment(s). Submissions are accepted only via GitHub Classroom (Invite Link: https://classroom.github.com/a/hfdkHr9c)*

Q1: Kaprekar's routine is an iterative algorithm named after Indian Mathematician D. R. Kaprekar. The algorithm is illustrated as follows - https://www.numberphile.com/videos/6174 Using BASH, implement the below:

a. Write a SHELL Program to implement Karprekar's routine by reading the input **(5 Marks)**
b. Handle the input exceptions and throw relevant prompt messages for at least 2-3 use-cases **(3 Marks)**
c. For given input, print number of iterations it took to return the Kaprekar's routine **(2 Marks)**

Q2: Write a BASH Script to per following tasks:

a. Identify types of files and directories available on your machine, print their names, file type, size of the file in KB **(5 Marks)**
b. Plot the data from above question in a graph using gnuplot package - http://www.gnuplot.info/ group by file type **(5 Marks)**
c. Extract the information from question 2(a) from 3 other machines and store it into single machine_info.txt. Write a BASH script to read machine_info.txt file and perform 2(a) and 2(b) **(10 Marks)**

Q3: Implement 'Stoplight Game' to illustrate Nash Equilibrium by providing random inputs to determine the outcomes. Include comment tag to describe each line of your program **(10 Marks) Source**: https://www.youtube.com/watch?v=0i7p9DNvtjk&t=142s

Q4: Perform the following using GIT by downloading from here - https://git-scm.com/ . Write all the outcome of the tasks below along with the commands in a single PDF.

a. Create a master repository using a GIT terminal in any version control platform (github, gitlab, bitbucket, gogs, codeberg, radicle, gitea etc.) and **add** files of any one question (Q, Q2, Q3) from this assignment into this repository. Capture repository **status** at this point. **(5 Marks)**
b. **push** the files of one question (Q1, Q2, Q3) from this assignment from your local machine to a repository. Capture repository **status** at this point. **(3 Marks)**
c. Create a new branch to your existing repository and now **pull** your repository locally, make changes to 10 lines and **merge** into the master repository. Capture repository **status** at this point. **(2 Marks)**

Submission Instructions:

1. *Create 5 folders, q1, q2, q3, q4 and include all scripts associated ith respective question under them.*
2. *Push all these folder files into your submission repository in GitHub classroom link.*
3. *Please do not forget to include a README.txt in your repository to mention your assumptions & execution instructions*
4. *Usage of LLM – If you are using an LLM for this task, please declare your usage with all the required details here - https://forms.office.com/r/E0BZVcm7ti*
5. *You will be awarded '0' if your submission is found to be plagiarized with other submissions.*

Scope*: The scope of this assignment is to understand basic BASH programming and GIT. Assignments are designed to explore, read, learn, understand and perform. It is a hands-on guide to practice and learn by doing. Please put all your self-efforts and work into this assignment. I wish you the best!*

`_(-_-)_/  Happy  -_-  Learning`