CSP203: Software Tools & Technologies Lab

Lab Exam-2 (Shell Scripting)

Date: 13-Sep-2024 **Duration: 1 Hour 45 minutes**

Max Points: 100

Instructions:

1. Create a directory in the desktop with a name as your **RollNo_LabExam2**. For each question you are trying to answer, create a subdirectory named <Question_No>. The subdirectory should contain all the files related to the question.
2. Inside the RollNo_LabExam2 directory you should create a README that should explain how to run your program for each question.
3. **README Carries 5 Marks.**
4. At the end of the exam, you should stop using the computer. Make sure you don't delete your solutions. Otherwise, you will not get any points.
5. Your TAs will collect your solution directory in a suitable format.
6. You can refer to manual pages of linux commands to explore the options.
7. Mobile phones and laptops are not allowed. The Internet will be disabled during the exam.
8. You are allowed to carry 1 print out sheet, as mentioned in the email.

Question-1:

Write a shell script that renames all the filenames in the current directory as follows. If the file name contains a string "abc" then you should replace it with "def".

Question-2 (Simple Dictionary):

Create a simple shell script for spell checker with the following details.

1. Create a simple **dict.words** file which should contain simple valid english words, each word should be separated by a line (you may write around 20-30 words of your own for testing and verification purpose).
2. Write a **spell.sh** that should take file **input.txt** and **dict.words** as command line arguments. Your program should check if each word occurring in the **input.txt** is a valid word as per the dictionary **dict.words**, if not it should list the words (separated by a line) that are not found in your dictionary.

   Note: For your convenience, you can assume **input.txt** contains only alphabets (lower/upper case), spaces, or line breaks. It does not contain any other symbols.

Question-3: Design of a simple firewall

Consider the following format used for various network parameters.

1. IP_ADDRESS: It has the format **Number.Number.Number.Number** where Number can be any 3 digit number. For example, 000, 010, 123, and 746 are valid Numbers.
2. PORT: It is any 4 digit number. For example, 0000, 0011, 9901, 8802 are valid port numbers.
3. DOMAIN: It is any website having **www.<string>.com** format where string can contain any number (>1) of alphabets. For example www.google.com, www.yahoo.com are the valid domains.

Consider the following files and their formats.

1. **firewall_rules.txt** file contains many lines, each line has two columns in the following format <IP_ADDRESS>,<PORT>

   Example of firewall_rules.txt content is
   123.234.365.789,2005
   223.487.999.100,1000
   123.234.365.789,2009

2. **DNS_mapping.txt** file has the mapping of DOMAIN to IP address in the below format. <DOMAIN> <IP_ADDRESS>

   Example of DNS_mapping.txt file should be:
   www.google.com 123.234.365.789
   www.yahoo.com 223.487.999.100

Design a simple firewall shell script named **firewall.sh** that informs whether a given website url should be blocked or non blocked. The firewall.sh should be designed with the following features. It should be given 3 options upon execution.

1. Add a firewall rule
2. Delete firewall rule
3. Check the block status of a website.

Option-1: Adding the firewall rule

It should accept 3 parameters, IP_ADDRESS, DOMAIN, and PORT. If all the inputs provided by the user are valid, then it should add IP_ADDRESS and PORT to the **firewall_rules.txt.** Similarly, it should add DOMAIN and IP_ADDRESS to the **DNS_mapping.txt**

Option-2: Delete a firewall rule

It should accept 2 parameters, DOMAIN and PORT. If all the inputs provided by the user are valid, then it should remove the line containing IP_ADDRESS (corresponding its DOMAIN from the **DNS_mapping.txt)** and PORT from the **firewall_rules.txt.**

Option-3: Check the block status of a website.

It should accept two parameters: DOMAIN and PORT. Your firewall should map the DOMAIN to the IP_ADDRESS using the **DNS_mapping.txt.** It should check if the IP_ADDRESS and the PORT matches with any line present in **firewall_rules.txt**. If yes, the firewall.sh program should print the output as “Your Website is Blocked” otherwise, it should print “Your Website is Not Blocked”.

Note: You can use as many linux commands as possible inside your script to save your time.