CS 251: OutLab: Pokémon....Gotta #!Bash em all

- Due: 11:55 AM 13^{th} August
- Please write (only if true) the honor code. If you used any source (person or thing) explicitly state it. You can find the honor code on Piazza.

Overview

The files you're given (on the support page www.cse.iitb.ac.in/~sharat/cs251/Assign/Lab03/support/WORLD.zip were pulled out from the Pokémon GO server....or at least we'd like you to believe that for the rest of the lab.The root directory consists of the continents. Inside each continent there are a few countries which in turn have cities,states etc within them. The cities can either be **files or folders**. There are a bunch of Pokémon scattered in different cities around the world. You're task is to find, unlock and capture them.
LETS GO Pokémon hunting !!!

A. First Capture

Task

Rumor has it that Pikachu is located somewhere in Japan. The city containing Pikachu has the following properties

1. The city is a regular file.
2. The size of the file is between 50KB and 100KB
3. The city name starts with t/T
4. The file is readable only by the user and not by the group or others
5. The file is not writable or executable by anyone

Find the city containing Pikachu and open it with a text editor to confirm you're capture.

Suggested Commands

- find - Find files/folders
- cd - Change directory
- ls - List files in current directory

Submission

Add a file taskA.txt to your submission folder with the following format

- Line 1: The name of the city you found
- Line 2: Full path from which commands were executed
- Line 3..end: The commands that you executed to find the file

B. Pokémon Groping

Task

The next Pokémon is located somewhere in the crowded city of Shanghai. If you navigate to China you can see that Shanghai is a regular file. One of the lines in Shanghai contains the Pokémon that you're searching for. Here's what we know about that line.

1. The line has the following structure "PokémonType PokémonName" without quotes
2. The type of the Pokémon is either Water or Grass (case insensitive)
3. The name of the Pokémon does not contain the characters b,m,B,M
4. The length of the name is between 6-10 characters

The following are valid examples of the line

- WaTer Finneon
- GraSS Petilil

Using extended regular expressions incorporate all the 4 conditions in order to find the Pokémon. You can do this using a single command or by piping to multiple commands. Note that only one line matches all the 4 conditions.

Suggested Commands

- sed - Transform and print lines matching a given regex pattern
- grep - Print lines matching a given regex pattern

It is strongly suggested you use extended regular expression.The commands don't support them by default and some additional switches need to be passed as arguments to enable extended regex.

Submission

Add a file taskB.txt to your submission folder with the following format

- Line 1: "PokémonType PokémonName" of the Pokémon that you captured
- Line 2: Full path from which commands were executed
- Line 3..end: The commands you executed to find the line

C. Concatenating Pokémon

Task

For the next Pokémon lets travel to Europe, more specifically Paris. The Pokémon that we are searching for is a special type of "Quantum" Pokémon. It's split over multiple files and you'll need to concatenate the files to capture it. In Paris there a lot of useless files and folders that we need to get rid of first.

1. Remove all the directories in Paris
2. Remove all the files that start with 'A'. Ex: Annay
3. Remove all files numbered from 1 to 20. Ex: 11
4. Remove all files that have a ".jpg" extension. Ex: Uhart.jpg

The remaining files when concatenated in a particular order contain the Pokémon.

5. Concatenate the files in ascending order of file names and redirect the output to a file named "ultraball.html"

Now if you open the file with a web browser you can see which Pokémon you've captured. If you don't redirect the output to a file i.e. print the output to the terminal, the name of the Pokémon does not appear. Any idea why?

Suggested Commands and Reading

- rm - Remove files or directories
- find - Find all files/folders satisfying given conditions
- cp - Copy files
- cat - Concatenate files
- Bash wild cards - Used to match file names given a pattern
- Bash IO redirection - Redirect terminal I/O from/to a file

Submission

Add a file taskC.txt to your submission folder with the following format

- Line 1: Name of the Pokémon that you captured
- Line 2: Command for task C.1
- Line 3: Command for task C.2
- Line 4: Command for task C.3
- Line 5: Command for task C.4
- Line 6: Command for task C.5

D. Pokémon Goes Web Crawling

Task

After touring Paris you decided to visit Venice and there you managed to capture a water type Pokémon. Unfortunately it escaped and hid itself on the web...behind, who'd imagine, a login form !!.

1. If you haven't already, visit Venice in order to get the login credentials.

In order to re-capture it you're suppose to login on the site www.cse.iitb.ac.in/~sharat/cs251/Assign/Lab03/support/login.php. There's a catch, thanks to the Pokémon's defenses you can login only using **cURL/wget**.

2. Login on above URL using cURL or wget

Try logging in using a web browser. How do you think we restricted the login using only cURL or wget?

Suggested Commands and Reading

- cURL - Transfer data to/fro a server
- wget - Download data from a server
- HTTP GET and POST requests
- URL Encoding

Submission

Add a file taskD.txt to your submission folder with the following format

- Line 1: Pokémon received when you successfully login on the site
- Line 2: "Username Password" obtained from Venice
- Line 3: Command used to login on the mentioned site

E. Pokémon Trading

Task

While you've been enjoying yourself in Europe, your other group members defected and decided to visit Moscow where they managed to capture the elusive Slowpoke. You badly wanted this Pokémon and your friend agreed to trade you Slowpoke for Bulbasaur. In case you forgot, you managed to capture Bulbasaur in Amsterdam located in Netherlands. In order to make the transaction you decided to use Ncat. Let's call your laptop, Laptop-Bulbasaur and your friends laptop as Laptop-Slowpoke. The goal of this task is to

1. Send Bulbasaur from Laptop-Bulbasaur to Laptop-Slowpoke
2. Send Slowpoke from Laptop-Slowpoke to Laptop-Balbasaur

Suggested Commands and Reading

- NCat - Send and receive data over the network
- ifconfig - Prints information about your network interfaces
- Servers and Clients
- IPAdress and Ports

Submission

Add a file taskE.txt to your submission folder with the following format.

- Line 1: The first line of Bulbasaur
- Line 2: The first line of Slowpoke
- Line 3: IP address of laptop(Laptop-Bulbasaur) from which Bulbasaur was sent
- Line 4: IP address of laptop(Laptop-Slowpoke) from which Slowpoke was sent
- Line 5: Command run on Laptop-Bulbasaur
- Line 6: Command run on Laptop-Slowpoke

F. The Case Of The Compiled Pokémon

Task

Hoping to catch a few rare Pokémon you decided to stop by in Kiev located in Ukraine. There you came across all sorts of files such as images, web pages, code files etc. But all of them had their extensions stolen by Team Rocket.

1. Find all the different mime types of files present in Ziev

Now that you know the different types of files, you know the extensions that each of the files should have and hence you can go about restoring them

2. Write a bash script to rename each file by adding the correct extension to it

Among all the files present you should have a few C code files.

3. Compile all the C source code files present in Ziev.
4. Execute the generated file and redirect both **stdout** and **stderr** to a file named "masterball"

Open the "masterball" with a text editor to see what Pokémon you've captured.

Suggested Commands

- file - Find the type of a file
- mv - Move files
- sort - sort data based on string comparison
- uniq - Remove duplicate lines which occur next to each other
- gcc - Compile C source code

Submissions

Add a file taskF.txt to your submission folder with the following format.

- Line 1: The Pokémon that you've captured using the masterball
- Line 2..end: The different **mime types** of files present in Ziev

Rename the script you've written in task F.2 as taskF.sh and add this file also in your submission folder

G. AWKémon Showdown

Task

Ukraine...the land of files. As you were leaving Kiev you stop by at Poltava where again you encounter a large number of files. Though this time the CIA tipped you off that a Pokémon is hidden in the file sizes.

1. List all the files along with their file sizes, sorted by the modification time. Suppose file A's modification time is Aug 5 21:03 and file B's modification time is Aug 5 21:05, then A comes before B in the sorted order.
2. Pipe the output from G.1 to another command in order extract the column containing the file sizes
3. The obtained file sizes are ASCII codes. Convert them to characters to get the Pokémon (you need not use Bash for this).

Suggested Commands

- ls - List all files and folders in a directory
- cut - Extract specific columns from data
- awk - Extract specific columns from data
- printf - Format print, data to the terminal

Submission

Add a file taskG.txt to your submission folder with the following format.

- Line 1: The name of the Pokémon obtained
- Line 2: The command (including pipes) used in G.2

H. Steganography And Pokémon

Task

Amazed by your Pokémon capturing skills the CIA decided to enlist your services for capturing a mysterious Pokémon. Unable to decline the offer you end up traveling to Virginia, USA. The only known thing about the Pokémon is that it is hidden in the corrupted file **corruptedPokémon.ppm**. After a careful analysis of the file you've come to the following un-corruption procedure.

1. Replace strings "flying" or "fighting" with "255 0 0"
2. Replace strings of the format "Attribute:Value" with "255 8 153". Attribute can be any of the following "Atk", "Sp.A", "Def", "Sp.D" and Value can be an integer ranging from 100 to 199 both inclusive.
    - Positive Examples - "Atk:139", "Sp.D:175"
    - Negative Examples - "Def:200", "SplA:11"
3. Replace strings of the form "HP-Value1/Value2" (where Value1 and Value2 can have 1, 2 or 3 digits) with Value1. For example
    - "HP-123/150" is replaced with "123"
    - "HP-55/70" is replaced with "55"

Suggested Commands

- sed - Find and replace specific patterns
- vim - Edit files in the terminal

Submission

Add a file taskH.txt to your submission folder with the following format.

- Line 1: The name of the Pokémon obtained
- Line 2..end : The commands used in H.1,H.2,H.3

I. The Last Pokémon

Task

After you're long and crazy tour you've finally decided to return back to Mumbai. On you're way back to your hostel you come across a zip file named "legendaryPokemon.zip". This piqued your interest and you try to open the file but find out that is password protected. In Mumbai you also find a file named "dictionary.txt"". On a whim you decide to try a dictionary attack on the zip file..... And hence your final task is to write a bash script that takes every word present in dictionary.txt and tries to open the zip file using that word as the password. Your script should unzip "legendaryPokemon.zip" and print only the correct password to the terminal.

Suggested Commands

- unzip - unzip a .zip file
- yes - endlessly print y to the terminal

Note that as long as you have a command line tool to open a file you can use that to perform such an attack on any type of files, be it zip files, word files or even web pages (heres where curl comes in handy

Submission

Add a file taskI.txt to your submission folder with the following format.

- Line 1 : The Pokémon you've unlocked from the zip file

Rename the script you've written as taskI.sh and add this file also in your submission folder

Submission Guidelines

1. When you submit, please document individual percentages such as Student 1: 80%, Student 2:100%, Student 3:10%. In this example, the second student will get full marks (10/10) and the first student will receive 8/10.
2. Do include a readme.txt (telling me whatever you want to tell me). Do include group members (name, roll number), group number, honour code, citations etc. This is the place for the reflection essay.
3. The folder you submit should contain the text files taskA.txt to taskI.txt along with the scripts taskI.sh and taskF.sh.
4. The folder and its compressed version should both be named `lab03_groupXY_outlab` for example folder should be named `lab03_group07_outlab` and the related `tar.gz` should be named `lab03_group07_outlab.tar.gz`

How We will Grade You [70 Marks]

1. Task A [**7 Marks**]
   - City name : 2 Mark
   - Correct Find command : 5 Marks
2. Task B [**7 Marks**]
   - Pokémon type : 1 Mark
   - Pokémon name : 1 Mark
   - Correct regex : 5 Marks
3. Task C [**6 Marks**]
   - Pokémon name : 1 Mark
   - Correct commands for each of the 5 tasks : 5 Marks (1 Mark for each part)
4. Task D [**10 Marks**]
   - Pokémon name : 1 Mark
   - Login Credentials : 1 Mark
   - Correct Page : 2 Marks
   - cURL/wget command : 2 Marks
   - Correct arguments : 4 Marks
5. Task E [**7 Marks**]
   - First lines of Bulbasaur and Slowpoke : 1 Mark
   - IP address of Laptop Bulbasaur : 1 Mark
   - IP address of Laptop Slowpoke : 1 Mark
   - Correct command run from Laptop Bulbasaur : 2 Mark
   - Correct command run from Laptop Slowpoke : 2 Mark
6. Task F [**10 Marks**]

- Pokémon name : 1 Mark
- Set of mime types : 4 Marks
- taskF.sh : 5 Marks

7. Task G [**6 Marks**]
    - Pokémon name : 1 Mark
    - Correct order of files : 2 Marks
    - Command used in G.2 : 3 Marks
8. Task H [**7 Marks**]
    - Pokémon name : 1 Mark
    - Regex for the 3 parts: 6 Marks (2 Marks for each part)
9. Task I [**10 Marks**]
    - Pokémon name : 1 Mark
    - Reading dictionary.txt in script: 2 Marks
    - Correct usage and integration of unzip command : 5 Marks
    - Printing only the correct password : 2 Marks