Shell scripting

Section 1: Basic Shell Scripting (Easy)

1. Write a shell script to print "Hello, World!".
2. Write a shell script to find the sum of two numbers entered by the user.
3. Write a shell script to check whether a number is even or odd.
4. Write a shell script to display the current date and time.
5. Write a shell script to check if a file exists.
6. Write a shell script to print the username and hostname of the system.
7. Write a shell script to calculate the factorial of a number.
8. Write a shell script to check if a number is positive, negative, or zero.
9. Write a shell script to display the first 10 lines of a file.
10. Write a shell script to find the largest of three numbers.

Section 2: Intermediate Shell Scripting (Moderate)

1. Write a shell script to count the number of words in a file.
2. Write a shell script to check if a string is a palindrome.
3. Write a shell script to reverse the content of a file.
4. Write a shell script to find the sum of digits of a given number.
5. Write a shell script to rename all files in the current directory by appending the current date.
6. Write a shell script to print the Fibonacci series up to a certain number.
7. Write a shell script to display the number of files and directories in a specified directory.
8. Write a shell script to find the greatest common divisor (GCD) of two numbers.
9. Write a shell script to convert all lowercase characters in a file to uppercase.
10. Write a shell script to check if a number is prime.

Section 3: Advanced Shell Scripting (Challenging)

1. Write a shell script to find all files of a specific extension in a directory and subdirectories.
2. Write a shell script to compare two strings.
3. Write a shell script to find the least common multiple (LCM) of two numbers.
4. Write a shell script to check whether a file is a regular file, a directory, or a symbolic link.
5. Write a shell script to implement a basic calculator that performs addition, subtraction, multiplication, and division.
6. Write a shell script to display the last modified time of a file.
7. Write a shell script to delete all files larger than a certain size in a directory.
8. Write a shell script to generate a random password with a specified length.
9. Write a shell script to count the number of files with read, write, and execute permissions.
10. Write a shell script to check if a process is running and display its process ID.

Section 4: File Handling and Text Processing

1. Write a shell script to search for a string in a file and print the line number where it appears.
2. Write a shell script to remove blank lines from a file.
3. Write a shell script to display the file permissions of all files in a directory.
4. Write a shell script to sort the content of a file in alphabetical order.
5. Write a shell script to merge two files line by line.
6. Write a shell script to count the number of occurrences of a word in a file.
7. Write a shell script to display the contents of a file in reverse order.
8. Write a shell script to find duplicate lines in a file.

9. Write a shell script to append the content of one file to another.
10. Write a shell script to extract a specified number of lines from a file.

Section 5: Loops and Conditions

1. Write a shell script to print all even numbers between 1 and 100.
2. Write a shell script to print the multiplication table of a given number.
3. Write a shell script to print the sum of all numbers from 1 to n using a for loop.
4. Write a shell script to count the number of files in a directory that have a specific extension.
5. Write a shell script to display all prime numbers between two given numbers.
6. Write a shell script to print a pattern like a right-angled triangle using stars (*).
7. Write a shell script to find the sum of even and odd numbers from 1 to 100.
8. Write a shell script to read a file line by line using a while loop.
9. Write a shell script to print the factorial of a number using a recursive function.
10. Write a shell script to display all filenames in a directory in reverse alphabetical order.

Section 6: Functions and Arguments

1. Write a shell script to define a function to check if a number is prime.
2. Write a shell script to pass arguments to a function and display the result.
3. Write a shell script to define a function that calculates the power of a number (e.g., base^exponent).
4. Write a shell script to define a function to find the sum of an array of numbers.
5. Write a shell script to swap two variables using a function.
6. Write a shell script to find the factorial of a number using a function.
7. Write a shell script to pass an array to a function and sort it.
8. Write a shell script to define a function to check if a year is a leap year.
9. Write a shell script to define a function to reverse a string.
10. Write a shell script to define a function that takes multiple arguments and returns their average.

Section 7: Arrays and String Manipulation

1. Write a shell script to find the length of a string.
2. Write a shell script to concatenate two strings.
3. Write a shell script to split a string into an array of words.
4. Write a shell script to find the smallest and largest elements in an array.
5. Write a shell script to sort an array in ascending order.
6. Write a shell script to reverse the elements of an array.
7. Write a shell script to check if an array contains a specific element.
8. Write a shell script to remove duplicate elements from an array.
9. Write a shell script to find the second largest element in an array.
10. Write a shell script to merge two arrays into one.

Section 8: System Monitoring and Management

1. Write a shell script to display the disk usage of your system.
2. Write a shell script to monitor the CPU usage of a process.
3. Write a shell script to check the available memory on your system.
4. Write a shell script to display the top 10 running processes by memory usage.
5. Write a shell script to monitor the available disk space and send an alert if it falls below a threshold.
6. Write a shell script to backup a directory to another location.
7. Write a shell script to schedule a system reboot at a specific time.
8. Write a shell script to list all installed software packages on your system.
9. Write a shell script to log the current user activity into a file.
10. Write a shell script to count the number of users currently logged in.

Section 9: Networking and Communication

1. Write a shell script to ping a list of IP addresses and check their availability.
2. Write a shell script to find the IP address of your system.
3. Write a shell script to display the network interfaces of your system.
4. Write a shell script to check if a specific port is open on a remote server.
5. Write a shell script to transfer a file from one server to another using `scp`.
6. Write a shell script to list all active TCP connections on your system.
7. Write a shell script to download a file from a URL.
8. Write a shell script to check the network latency between your system and a server.
9. Write a shell script to monitor network traffic on a specific interface.
10. Write a shell script to retrieve the HTTP status code of a webpage.

Section 10: Advanced Automation and Scripting

1. Write a shell script to automate database backups at regular intervals.
2. Write a shell script to monitor a directory and automatically compress any new files added.
3. Write a shell script to automate the deployment of a web application.
4. Write a shell script to automate log rotation based on file size or age.
5. Write a shell script to parse and analyze web server logs for 404 errors.
6. Write a shell script to monitor a file for changes and alert the user.
7. Write a shell script to schedule and automate the cleanup of temporary files.
8. Write a shell script to generate reports from a CSV file.
9. Write a shell script to automatically mount and unmount network drives.
10. Write a shell script to automate the installation of software packages on a new system.