Bahria University

Karachi Campus



**COURSE: CSC-320 OPERATING SYSTEM**

**TERM: Spring 2020, CLASS: BSE- 4B**

**SUBMITTED BY:**

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**SIGNED REMARKS: SCORE:**

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| **2** | **12/2/2020** | **2** | Linux Commands and Shell Scripting |  |
| **3** | **19/2/2020** | **3** | Calling C Programs Using Shell Scripts |  |
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LAB EXPERIMENT NO. 1

LIST OF TASKS

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| TASK NO | OBJECTIVE |
| Task 1 | Answer the following questions.   * In Linux operating system, describe the kernel. * In Linux desktop environment, describe the benefits of virtual desktops * While GUI based tools do exist in Linux, what is the purpose of using the command line interface, i.e. shell? * Use one of the options with the ls command, and describe its usage. |
| Task 2 | By using the command line shell interface, practice the commands given in this lab. Write briefly about the usage of each command. |
| Task 3 | By using gedit, open a text editor and write the C program given below. Save the written file as “hello.c”. In order to compile and execute the output file, do the following: Write down the output of the program below (provide snapshot). |
| Task 4 | Make changes within the above program to display a new output text as given below. Write down the developed program. |

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LAB EXPERIMENT NO. 2

LIST OF TASKS

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| TASK NO | OBJECTIVE |
| Task 1 | Practice all the Linux commands discussed in this lab while taking assistance using the man command. Write the complete syntax used for utilizing the cp, mv and rm commands in Linux shell. |
| Task 2 | Write a shell script to display your address over multiple lines. |
| Task 3 | Write a shell script that would traverse among any three directories that are placed under the /home directory. While moving from one directory to another, the script should display the name of the current working directory and list the content within that directory, including the hidden files. |
| Task 4 | Write the C programs provided in this lab and generate their outputs over Linux environment (provide snapshot). |

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LAB EXPERIMENT NO. 3

LIST OF TASKS

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| TASK NO | OBJECTIVE |
| Task 1 | Create an empty file with a .txt extension. Write a shell script that would write the current date, student’s name and registration number into that file, while using variables for all three entries. |
| Task 2 | Create a .txt file and input ten lines of entry while mixing it with both alphanumeric characters. Sort the contents of the created file in an ascending order and write the sorted output into another file. |
| Task 3 | Write two different C language programs that would generate the following for a given number, e.g.:   1. Calculate the factorial of. 2. Calculate the Fibonacci series (0, 1, 1, 2, 3, 5, 8...) up to.   Compile and run both programs using a single shell script, while having a running gap of 5 seconds between the first and second program. The generated output should properly display on which program is currently running (tip use *echo* command). |

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LAB EXPERIMENT NO. 4

LIST OF TASKS

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| TASK NO | OBJECTIVE |
| Task 1 | Write a single shell script that creates four different files, while taking the names of all created files as input from the user. As the files contents, insert your name in the first file, registration number in the second and section details in the third. These should be followed by merging the contents of all three files into the fourth one. |
| Task 2 | Write a shell script that creates a “Files Location Log”. The paths of all files, having the same extension, should be stored in one log. The file extension should be taken as an input from the user, and the created logs should be named as “mylog\_extension.txt”, where “extension” is that taken as input from the user. The search process should be for all file in the system, starting from the root directory (/). All log files of different file extension should be stored inside a single directory by the name of “mylog” that would be present at your home directory. |
| Task 3 | Write a shell script that either performs a file sort, file search or directory listing operation based on the user’s selection of the operation he/she would like to execute. |
| Task 4 | Write a C program that takes values of two matrices of size (𝑚×1) and (1×𝑛) as input from the user. Multiply the above two matrixes and store the resulting (𝑚×𝑛) matrix in a 2D array. Display the contents of the first and second matrices and also the resulting matrix. Achieve alignment in the displayed content as much possible. |

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LAB EXPERIMENT NO. 5

LIST OF TASKS

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| TASK NO | OBJECTIVE |
| Task 1 | While utilizing the Linux commands studied so far, provide an example (other than the one shown in this Lab) of a combination of several Linux commands in which pipes are used more than once. Also provide a snapshot of the generated output. |
| Task 2 | Write a shell script that records the full path of all the files present within a directory into a record.txt file. Along with full path name, the script should also record the number of words, characters and lines within each file. |
| Task 3 | Write a C program that asks the user to provide an integer input in the main() function. The program would call a function even\_odd() from the main() function, where the function even\_odd() accepts an integer as an argument, determine and display if the passed integer is either even or odd. |

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LAB EXPERIMENT NO.6

LIST OF TASKS

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| TASK NO | OBJECTIVE |
| Task 1 | Write what you have learned in few lines on each of the three programs that were using the *fork()* system call. |
| Task 2 | Write a C program that uses *fork()* system call to print a single line eight times without using *for* loop and repeated *printf* command. |
| Task 3 | Code the C program given below and explain what it does along with providing a snapshot of the output. Investigate and write about the usage of *execlp()* system call. |

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LAB EXPERIMENT NO. 7

LIST OF TASKS

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| TASK NO | OBJECTIVE |
| Task 1 | Implement the codes of Example#01 and Example#02. Discuss what you have learned after implementing and executing these two codes. Provide snapshots of the generated outputs. |
| Task 2 | The FCFS source code given above assumes that the arrival times for processes are provided in ascending order of time. Modify the code in C language for random process arrival times. |
| Task 3 | Implement Round Robin Algorithm in C language |
| Task 4 | Implement SPN algorithm in C. |

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LAB EXPERIMENT NO.8

LIST OF TASKS

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| TASK NO | OBJECTIVE |
| Task 1 | Execute both commands. Try different options and observe the results. What have you learnt? Discuss. |
| Task 2 | Explore HTOP, including its all options. Attach Outputs for the same. Discuss your Observations. |
| Task 3 | Write a multithreaded C program for performing summation of numbers |

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LAB EXPERIMENT NO. 9

LIST OF TASKS

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| TASK NO | OBJECTIVE |
| Task 1 | Semaphore is one of the concurrency mechanisms available. Find out about more concurrency mechanisms. How do these mechanisms protect critical sections? Compare their implementations with wait () and signal () operations of semaphores. |
| Task 2 | Implement Producer Consumer Problem in C language using Semaphore. |

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16/4/2020

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LAB EXPERIMENT NO. 10

LIST OF TASKS

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| TASK NO | OBJECTIVE |
| Task 1 | Implement the Banker’s Algorithm explained above in C language. |
| Task 2 | Study and implement Safety algorithm and Resource-Request Algorithm in the above program. |

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23/4/2020

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LAB EXPERIMENT NO. 11

LIST OF TASKS

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| TASK NO | OBJECTIVE |
| Task 1 | Implement Segmentation Algorithm using c language. |

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LAB EXPERIMENT NO. 12

LIST OF TASKS

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| TASK NO | OBJECTIVE |
| Task 1 | Implement the semaphore-based solution to Dining Philosophers’ Problem explained above in C language. |

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LAB EXPERIMENT NO. 13

LIST OF TASKS

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| TASK NO | OBJECTIVE |
|  | Following the code guideline of Best-Fit Placement algorithm, write the C language program for First-Fit and Next-Fit Placement algorithms. |

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3/6/2020

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