جامعة الحسين التقنية
Al Hussein Technical University

ASSIGNMENT BRIEF

HTU Course No: 30201420 **HTU Course Name:** Operating Systems

BTEC UNIT No: ---------- **BTEC UNIT Name:** ----------

Version: 1

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Al Hussein Technical University

Assignment Brief

Student Name/ID Number/Section	
HTU Course Number and Title	30201420 **Operating Systems**
Academic Year	2020/2021
Assignment Author	Eng. Moath Malkawi
Course Tutor	Eng. Moath Malkawi
Assignment Title	Junior operating system administrator.
Assignment Ref No	**No. 1**
Issue Date	7-May-2022
Formative Assessment dates	4-June-2022
Submission Date	16-June-2022
IV Name & Date	Eng. Malik Al-Lawzi

Submission Format

Deliverables:

1: Report:

- Report: (The report should include screenshots and explanations for each task)

2: Recorded Video:

- The **Commands** you used to perform the duties in some tasks should be shown for **task 4,7,8,9,10 & 11** .
- Upload the recorded video on YouTube and make sure to make it Publicly accessible or Unlisted sharing.

3: Presentation one to one assessment for the research task. (Task L)

Please follow the following before submitting your work:

- Sign the student declaration form attached to this assignment brief.
- Make use of appropriate structure in your report – including headings, paragraphs, subsections, and illustrations.
- Your research must be accompanied by written material that explains how you conducted your research at the same time observing strict processes, procedures, guidelines, legal, professional, ethical, and security considerations.
- Sign witness statement after your discussion.
- Your submissions should be in the form of soft copy via the eLearning school system. The report should be:
  1. Written in professional style format
  2. Your work must be supported with references using the Harvard reference system.

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Unit Learning Outcomes
LO1 Investigate different Operating Systems, their functions and user interfaces. **LO2**. Explore the processes managed by an Operating System. **LO3** Demonstrate the use of DOS, Windows, UNIX, and Linux. **L04** Analyse appropriate techniques and technologies used in distributed and concurrent systems.
Assignment Brief and Guidance

Scenario:

X company recently decided to hire a Junior System administrator specifically working on Linux and Windows OS infrastructure, and you have applied for this vacancy. Afterwards, your application is approved to go the next step for solving technical tasks. you have been asked to solve the following tasks using the Bash Shell commands or GUI (depends on the task):

1. Given the following information:

Job list:

Job Number	Memory Requested	Memory Block	Memory Block Size
Job 1	690 K	Block 1	900 K (low-order memory)
Job 2	275 K	Block 2	910 K
Job 3	760 K	Block 3	300 K (high-order memory)

a. Use the best-fit algorithm to indicate which memory blocks are allocated to each of the three arriving jobs.
b. Use the first-fit algorithm to indicate which memory blocks are allocated to each of the three arriving jobs.

I. Use the best-fit algorithm to indicate which memory blocks are allocated to each of the three arriving jobs.
II. Use the first-fit algorithm to indicate which memory blocks are allocated to each of the three arriving jobs.

2. Compare and contrast a fixed partition system and a dynamic partition system and show the difference between contiguous allocation and non-contiguous allocation.

3. Add new users and a new group according to the following requirements in Linux:
    I. Change the default system settings for newly created users to ensure their passwords are changed at least every 180 days.
    II. Create a new group named **Students** with a GID 30000.
    III. Create three new users: Ahmad, Ali and Mohammad with a password **firstpw.**
    IV. **Add the new users to the supplementary group Students. The primary group should remain as the user private group.**
    V. **Set the three newly created accounts to expire 180 days from today.**
    VI. **Change the password policy for the Mohammad account to require a new password every 20 days.**
    VII. **Force all three newly created users to change their password on first login.**

4. You are working as a junior System administrator at HTU, and your technical manager has assigned you to **install a WordPress Website on Redhat Enterprise 8 and in Windows server**.

   Your duty is:

   I. Create a new user called your first name and add this user to sudoers users.
   II. Install httpd, Mariadb, php services on this server.
   III. Install wordpress files on your server.
   IV. Start the following services using systemctl command: httpd, php and Mariadb.
   V. Configure the **Apache webserver to start at each system boot**.
   VI. **Add your user to the apache group**.
   VII. Change the **group ownership** of **/var/www** path and its content to apache group.
   VIII. Change the **directory permissions /var/www** and its subdirectories permissions to write permissions for owning user and owning group.
   IX. **Please use the internet to find more details of how you can install WordPress website on Redhat server**.
   X. **Please do not use the root user during the installation and use it only when you change the group ownership**.
   XI. **You can test you installation by taking the public ip address of your server and pasting it on any internet browser**. (Make sure that http port is open on the security group).
   XII. Install the WordPress on Windows the same as you did in Linux Redhat.
   XIII. Compare between Windows server and Linux in terms of security and usability.

5. Create the shared directory /home/Students according to the following requirements:
    - The directory is owned by user root and group Students.
    - Set Permissions on the /home/Students directory so it has SETGID bit set on the directory. The owner and group have read/write permissions and other users have read permissions to the directory.

6.

    - Create 10 files under your home directory (File names = jerry, kramer, george, lex, clark, lois, homer, bart, lisa, and marge).
    - Create 3 directories under your home directory (Dir name = seinfeld, superman and simpsons).
    - Create a new file jupiter and write to it as "Jupiter is a planet". Then create a soft link in /tmp directory.
    - Also create a hard link of jupiter in /tmp directory.
    - Check the inodes of both links.

7. Create a Shell script that moves any new file / directory created in the home directory to directory called " YourFullName+ShellScript" and run this script automatically every minute.

8. Using the PowerShell commands in Windows install python software (any version) using a newly created user and give this user the right permissions to do the task.

9. Use the Disk management feature to add a new partition in Windows (any volume size is accepted).

10. Perform the following script **(while true; do echo -n "Add two statement" > ~/output.txt; sleep 1; done) &**

    - Run command jobs and see if the mentioned script is running.
    - Using the Kill command stop the command and then run it. (Use –SIGSTOP and –SIGCONT).
    - Add another script that save the result on the same **output.txt** file and manipulate on the script to run the first script and the other one in the stopping mode and vice versa. (Make sure to view the results on **output.txt** file).
    - Switch to root user and terminate the process of the script running by EC2-user.

11. (Research) you are requested to do research on the following points:

Future of operating systems:

- Consider desktops, laptops, smartphones, and other devices in terms of operating systems development environment.
- Introduction of artificial intelligence and impact on operating systems development e.g., mobile operating systems like Android and iOS equipped with AI-based voice assistants.
- Connectivity e.g., Internet of things.
- Support for cloud computing and outsourcing of operating system functions in the cloud.
- Open-source operating systems and their impact on future development projects.
- Review trends in virtualization, emulation, and use of sophisticated operating systems in mobile.
- systems. Security e.g., biometrics.
- Multi-modal interaction e.g., touch, type, speech. User centered design.
- Automation of common tasks based on user habits

12. After working in two types of operating system evaluate the functionality, interface and design for both Operating systems.

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Assessment Criteria

Pass	Merit	Distinction
LO1 Investigate different Operating Systems, their functions and user interfaces.		**LO1, LO2 & LO3** **D1** Critically evaluate the functionality, interface Design and processes of the operating system.
P1 Explore what an Operating System is. **P2** Prove the ability of mastering Linux basic commands and Windows PowerShell.	**M1** Provide evidence of showing how the operating system work in terms of hardware and software.	
LO2. Explore the processes managed by an Operating System		
P3 Research the process of Memory Management in an Operating System. **P4** Investigate the process of job scheduling.	**M2** Explore and apply the needed commands to handle any process and avoid security threats by using these commands.	
LO3 Demonstrate the use of DOS, Windows, UNIX, and Linux.		
P5 Show the ability of dealing with DOS, Windows, Unix, and Linux OS. **P6** Implement system administration commands on Linux and Windwos.	**M3** Show the ability of managing services and packages in Linux and Windows. ..	
L04 Analyze appropriate techniques and technologies used in distributed and concurrent systems.		LO4 **D2** Critically evaluate your work and make some recommendations about current Operating Systems and future advancements.

P7 Discuss future of operating system. **P8** Discuss open source operating systems and their impact on future development projects.	**M4** Justify which techniques and Technologies you would use in an Operating system.	

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STUDENT ASSESSMENT SUBMISSION AND DECLARATION

When submitting evidence for assessment, each student must sign a declaration confirming that the work is their own.

Student name:	**Assessor name: Eng Moath Malkawi**	
Issue date: **12th April 2021**	**Submission date:** **4th June 2021**	**Submitted on:**
Programme:		
Course Name: Operating System **HTU Course Code: 10102192**	**BTEC UNIT:** 49	
Assignment number and title: **No. 1**: **Protecting Users from use of technologies**		

Plagiarism

Plagiarism is a particular form of cheating. Plagiarism must be avoided at all costs and students who break the rules, however innocently, may be penalized. It is your responsibility to ensure that you understand correct referencing practices. As a university-level student, you are expected to use appropriate references throughout and keep carefully detailed notes of all your sources of materials for the material you have used in your work, including any material downloaded from the Internet. Please consult the relevant unit lecturer or your course tutor if you need any further advice.

Student declaration

I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.

Student signature: **Date:**