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| Assignment on UNIX and C |  |
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|  | Brief write-up on UNIX and Linux flavor UNIX operating system was first developed in the 1960’s. From then till now, the operating system has gone through constant development. It accepts multi- user and also multi-tasking systems for servers of desktops and laptops.  UNIX operating system has a graphical user interface (GUI) that is similar to Microsoft Windows which provides a user friendly environment. For certain operations which have no windows interface or graphical program, knowledge of UNIX is required.  TYPES OF UNIX | |  |

There are different versions of UNIX available for users. This versions share common similarities. The most popular versions of UNIX are:

1. Sun Solaris
2. GNU/Linux
3. MacOS X

**Linux**

Linux is a UNIX-like open-source operating system based on Linux operating system kernel first released on the 17th of September, 1991 by Linus Torvalds.

Linux is usually packaged as a Linux distributions or Flavors. Flavors of Linux includes the Linux Kernel, supporting system software and libraries. 2 Popular Linux flavors include:

1. **Ubuntu**

In recent years, Ubuntu has been the most popular flavor of Linux. Ubuntu arrival was announced in the year 2004. It was founded by South African millionaire Mark Shuttleworth, Canonical.

Ubuntu Operating system is based on Debian and it has all known apps like Firefox, etc. Ubuntu is also known for its predictable 6 month release schedule. It is easy to use and includes migration assistant for Windows user. It also supports latest technologies.

Ubuntu also has its own sub flavors which are used for specific niches, they are;

1. Kubuntu
2. Xubuntu
3. Lubuntu
4. **Fedora**

Following closely behind Ubuntu is Fedora. A free version of Red Hat, who’s RHEL which means Red Hat Enterprise Linux, has been a commercial product since 2003.

Like Ubuntu, Fedora also offers a six month release schedule with excellent security features. It is one of the best choices for new Linux users.

## Software Functional Requirement

Functional requirement can be described as the service narrative which a software must possess or offer. It gives the description of a software components. A function can be said to be inputs which a software system takes in. It can be in different forms, which may include; calculation, data manipulation, business process, user interaction, or any other unambiguous functionality that outlines the functions a system is likely to perform. In Software Engineering it is also known as called **Functional Specification**.

It helps capture the intended behaviors of a system and can be in form of a high- level abstract statement of the needs of the sender to a well comprehensive mathematical functional requirements specification.

The functional requirements of a software should have the following:

 Details of processes conducted in all screen

 Data handling logic must be entered in the system

 it should include descriptions of the software reports or other outputs

 Comprehensive information about the workflows executed by the software

 It should clearly define who will be allowed to create/modify/delete the data in the system

 It should specify how the software will achieve applicable regulatory and compliance needs should also be included captured in the functional document

Benefits of software functional requirement

Below are the benefits of creating a software functional documents

* A functional requirement document aids the user to define the functionality of a software
* Functional requirements document along with requirement analysis help identify missing requirements. They help clearly define the expected system service and behavior.
* Errors caught in the Functional requirement gathering stage are the cheapest to fix.
* Support user goals, tasks, or activities

**Types of Functional Requirements**

Here are the few of the most common functional requirement types:

* Transaction Handling
* Business Rules
* Certification Requirements
* Reporting Requirements
* Administrative functions
* Authorization levels

## Why UNIX is a preferred choice OS

There are different reasons why UNIX is preferred at some certain times. Below are few of the most common reasons why UNIX is a preferred OS.

1. Open sourced OS

UNIX was developed has an open source operating system. Users can therefore design the source based on their needs or requirement.

1. Processing

UNIX allows multiprocessing. This allows the operating system to execute many operations simultaneously.

1. Security

It provides safe and secure environment for its users

## UNIX a scientist operating system

UNIX is called a scientist OS because it is majorly preferred to by developers for example Data Scientist and software engineers.

* Unix makes it easier to utilize package managers
* Easy connect to all UNIX-like servers
* Developers find it easier to use the shell and command line
* It supports all programming languages

## C Programming language

C is a general –purpose programming language that is very popular, simple and also flexible to use, it is used for system programming and application because it harnesses the powers of both a low level language and a high level language. It is a structured and procedural programming language.

C is known to be a machine independent and extensively used programming language, It is used to write various applications, operating system e.g. UNIX, Python, etc.

It is also known as the foundation of learning other programming language. It supports various ranges of operators, data structures and loops.

## Detailed Structure of C

Syntax of a C program

#include<stdio.h>

#define a

int main ()

{

//comment

Content

return 0;

}

Sections of a C program

The following under listed consist the section of a C program

1. Documentation Section

This is the statement specified to give more information about a code.

//comment

1. Preprocessor Section

This section contains all header files to be used in the program. It lets the system link the header files to the system libraries.

It is written as #include<stdio.h>

Note: #include is constant while stdio.h is not constant.

1. Define section

This is use to declare a constant using the define keyword e.g. #define a

1. Global declaration section

This section consists of all global declarations used in a program e.g.

float num = 0.2;

int i = 1

1. Main function section

This is the first section which is executed. All c programs must include the main function.

It is written as main (), int main () etc.

1. Local declaration functions

This are variables that are declared in a function e.g.

for (int i = 1; i < 4; i++)

1. User Defined Functions section

The user defined functions are functions which are specified based on the given requirements made by a user. E.g. sum ()

**Return function:** In C, the return function is the last section of the code or program. It is not mandatory to include it but it id include when a program is expected to return a value.

## Creating C program file of the OS

Using Ubuntu OS as a study case

Requirements

1. Text Editor
2. C compiler
3. Terminal

Procedure

1. Check for c compiler on your terminal using the command “gcc – version”
2. If there is no compiler, a compile can be installed using the command “sudo apt update”, “sudo apt install build-essential”
3. When you have your c compiler installed, type the command “gedit filename.c” on your terminal to open a text editor for your code
4. Write whatever code you wish to run and save.
5. To run your code on the terminal, use the command “gcc –o filename filename.c” and click enter.