IMPLEMENTATION OF THE USE OF THE C PROGRAMMING LANGUAGE IN THE UBUNTU LINUX OPERATING SYSTEM

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ABSTRACT
The rapid pace of technological advancement has predominantly restricted the use of the C programming language to specific fields. This study aims to enhance accessibility to the C programming language for students and the general public on the Ubuntu Linux operating system. The research methodology employed is observational, facilitating the attainment of desired outcomes through systematic observation. This research focuses on implementing the C programming language within the Ubuntu Linux environment to validate its performance compared to its usage on Windows operating systems. The compilation and execution processes differ significantly on Ubuntu Linux, necessitating a distinct approach. Beyond validating these outcomes, the study aims to enhance user proficiency and understanding of C programming within the Ubuntu Linux environment. The Ubuntu Linux platform is essential for various scientific disciplines. The integration of the C programming language into the Ubuntu Linux operating system yields distinctive output displays, critical for advancing both information systems and broader fields of knowledge in alignment with evolving programming practices.

Keywords: C programming language, Ubuntu Linux, Technology development, Comparative performance.

1. INTRODUCTION
The development of science and technology is accelerating, especially in the field of information and communication technology. One sector that has experienced significant growth is software technology. According to (Dixit et al., 2023), software is a vital element in the modern technology world. This software is a part of the computer that cannot be physically touched but greatly influences the performance and function of the computer itself. (Capra et al., 2020) emphasize that without software, computer hardware would not function optimally. Even adds that software plays an essential role in various aspects of our lives, from simple applications on mobile phones to complex systems that operate global communication networks.

Given the importance of software in the technology world, a deep understanding of the various types and functions of software becomes crucial. One type of software that is important to learn is the operating system, such as Ubuntu Linux. According to (Albonico et al., 2023) an operating system is software that acts as a bridge between the user and the computer hardware. Ubuntu Linux, one of the popular Linux distributions, offers various advantages such as high
security, low cost, and great flexibility in its use (Patil & Pournouri, 2023). Therefore, a course on the Ubuntu Linux operating system becomes very relevant for those who want to delve into the field of information and communication technology. Through this course, participants can understand how operating systems work, manage and optimize computer performance, and develop the technical skills needed in the modern information technology industry.

So the researcher wants to implement what has been implemented in the operating system course, which is currently not only the Windows operating system which is included in the discussion in this operating system course, but the Ubuntu Linux operating system. With the Ubuntu Linux operating system in the STMIK Professional Makassar campus environment, especially the informatics management study program using direct practical learning methods. The use of the Ubuntu Linux operating system with direct practical methods is expected to increase students' understanding of using the Ubuntu Linux operating system. By conducting experiments or experiments it will become more interesting and can enrich the experience of developing a scientific attitude and the results of learning understanding will last longer in memory, both among the general public and programmers and among students and students.

The use of programming in general is still in the Windows operating system, therefore researchers are interested in using programming in the operating system, in this case, the Ubuntu Linux operating system, to see and compare the appearance of the resulting output. The use of C programming language on the Ubuntu Linux operating system is the right thing in this study. The discussion on this operating system is not a Windows operating system but Ubuntu Linux. Even though learning operating system courses to apply in general, especially about basic commands in configuring a computer system seems easy, it has a large influence in general for Linux users, especially in work environments that demand skills to be fast and precise in computer settings using the Ubuntu Linux operating system. A programming language, also known as a computer language, is a set of syntax and semantic rules used to define computer programs (Gurevich & Huggins, 1992; Winskel, 1993).

Based on the above background, the authors raise the title Implementation of the Use of C Language Programming in the Ubuntu Linux Operating System which is expected to help beginners and those who want to develop programming on the Ubuntu Linux operating system in general and researchers in particular.

2. THEORY

Operating System (Operating System) commonly abbreviated as OS, is a software (software) system that is in charge of controlling and managing hardware and basic operations of computer systems (Sharp, 2023). This management includes running application software such as word processing programs, multimedia players, and so on (Khairunisa et al., 2023). An operating system is a set of software routines that sits between the application programs and the hardware. All software runs under the control of the operating system, accesses hardware through the operating system, and follows the rules implemented by the operating system (Belsare et al., 2023). Small operating systems, such as Linux Familiar installed on pocket PCs have limited storage media (Fox, 2021). This causes a reduction in the packets contained therein. One of the packages that was reduced was gcc, which is the basic compiler on Linux.
This makes adding new packages difficult, because most of the new packages are provided in the form.tar.gz (tarball), and must be compiled with gcc (Wahab & Syarif, 2010).

Linux is a term that refers to an operating system that is licensed under the GPL system (GNU General Public License or Guaranteed Public for Life). In a narrow sense what is called Linux is only the kernel (Belajarit, 2023; Muhammad, 2024). Linux is an open-source operating system software that is free to distribute under the GNU license, Linux is a derivative of UNIX and can work on a variety of computer hardware (Fitriahadi et al., 2020; Maryanto, 2014). With the GNU license (Gnu Not Unix) we can obtain the program, complete with the source code. Linux in a broad sense is an operating system that has been equipped with programs to work on terminals such as DOS and desktop applications such as Windows or Macintosh (Bazuku et al., 2023). In a narrow sense or technical sense, Linux is the kernel or core of an open-source operating system (Balakrishnan, 1999).

2.1. Kernel Linux

The fundamental difference between Linux and other operating systems lies in the Linux Kernel and the components in the system which are free and open (Mishra et al., 2023). Linux is not the only open-source operating system, even so, Linux is the most widely used open-source operating system (Devi et al., 2015). The Linux kernel was originally written as a hobby project by Finnish university student Linux Torvalds studying at the University of Helsinki, to create a free and editable Minix kernel (Kuwabara, 2000). The kernel is the core of an operating system that functions as a controller and controls the performance of everything on the system (Von Hagen, 2010). Even though Linux is the idea of many people and specialists, Linux is not a decomposed operating system (Harjono, 2016).

2.2. Programming Language

In the context of programming, there are a number of programming languages, Pascal, C, C++, and BASIC (Dewi, 2010; Hanief et al., 2020; Taufiq, 2022). Broadly speaking, programming languages are grouped into two, namely high-level languages and low-level languages (Ben-Ari, 1996; Mitchell, 2003; Winograd, 1979). High-level languages are human-oriented programming languages (Pratama, 2014; Saragih, 2016). Programs are created using a programming language that is easy for humans to understand, usually using English words; for example IF to declare if and AND to declare and. Included in this language group are C languages. C++, Pascal, and BASIC. Low-level languages are machine-oriented programming languages (Pane & Abdullah, 2020).

This language uses a binary code (which only recognizes 0 and 1 codes) or a simple code to replace certain codes in the binary system (Kadir, 2019). Those belonging to this language group are machine and assembly language. Languages like this are very difficult for ordinary people to understand and very boring for programmers who are used to high languages. Programmers must really master the technical computer operations. However, this generation of languages provides very fast program execution. In addition to this, machine language is very machine-dependent, which means that machine language between one machine and another is much different(Heriyanto, 2006). Currently, the C++ programming language has
evolved through a standardization process carried out by ANSI (American National Standards Institute) and ISO (International Standards Organization), namely by adding new features that are not yet supported by classic (original) C++ (Az-zahir, 2023; Noor, 2022). The specialty of the C++ language is that this language supports object-oriented programming, or what is more commonly known as Object Oriented Programming (OOP), which has made this C++ language popular among programmers and students alike (Kasih & Mahdiyah, 2018).

C language is the international language of all existing programming languages. That is, the C language has the largest number of users in the world. Besides that, the C language is a type of language that needs to be compiled (compiled) to produce programs.

3. METHOD
This research is experimental in nature, utilizing qualitative data. The data collection technique employed in this study includes a literature review, involving the study of library books and Internet sources (Ullah & Ameen, 2023). Additionally, interviews with several programmers, particularly those proficient in the C programming language, were conducted to gather information regarding the limitations and requirements for presenting the material. The observation method was also used; by making observations, the research aims to achieve the desired results, both in general terms and in the specific application in the required field.

4. RESULTS AND DISCUSSION
The discussion in this study focuses on the implementation of the C programming language within the Ubuntu Linux operating system. Prior to this research, programming activities were conducted on the Windows operating system, using either an editor or simply Notepad. The results of the discussion indicate the effectiveness of using the C language in the Ubuntu Linux environment. Starting with the main view according to the version installed, the Ubuntu interface offers several options similar to those found in Windows, including word processing applications, spreadsheet programs, and web browsers. For programming purposes, all necessary software, including editors and compilers, must be installed.

In the context of implementing the C language on the Ubuntu Linux operating system, the gedit text editor, which is already available in Ubuntu, is used. The setup and execution of C language programs follow the standard procedures for the Ubuntu Linux operating system. The steps for implementing and using the C language on Ubuntu include installing the necessary software, writing the C program in gedit, compiling the program using the gcc compiler, and running the executable file through the terminal. The discussion highlights that the Ubuntu Linux operating system provides a robust environment for programming in C. The integration of essential tools and the flexibility of the terminal make it a suitable choice for developers. By following these procedures, users can effectively implement and utilize the C programming language on Ubuntu Linux.
Figure 1. Front view of the Ubuntu Linux operating system

Figure 2. Display home directory

Figure 3. Getchar in C programming language
The implementation of the C programming language within the Ubuntu Linux operating system serves as an initial stage for our ongoing research into this platform. This study involves a comprehensive comparison of Ubuntu with other operating systems, including Windows, Android, iOS (Apple), and Google's Chrome OS. In addition to this comparison, we will focus on data communication and computer networks within the Ubuntu Linux environment, as well as the use of several other programming languages on this operating system.

This analysis serves as a state-of-the-art foundation for the continuation of our research efforts. The development stages of our program include defining the problem and conducting a thorough analysis, encompassing several key components: the purpose of the program, which outlines the objectives we aim to achieve; the parameters used, identifying the specific variables and inputs; the facilities provided, detailing the features and functionalities offered to users; the algorithms employed, describing the procedures implemented to solve identified problems; and the programming language used, with a primary focus on C within the Ubuntu environment. This structured approach ensures that our research is comprehensive and systematically addresses the core aspects of operating systems and programming within the context of Ubuntu Linux (Amanda, 2021).
5. CONCLUSIONS AND SUGGESTIONS
Based on the results of the analysis and discussion at all stages of the research, conclusions were obtained regarding the method of observation of the implementation of the use of the C language in the Ubuntu Linux operating system, that research is still in the early stages of analyzing and implementing programming languages in the Ubuntu Linux operating system. The researcher's hope at this stage is that more teachers and programmers will use the Ubuntu Linux operating system on a computer system. But for researchers who want to continue the Ubuntu Linux operating system in a programming language, they can use an editor other than gedit. So get more optimal results and produce a more attractive output. The process of computer programming is not just writing a sequence of instructions that must be carried out by the computer but also aims to solve a problem and make the work of computer users easier.

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