University of Information Technology and Sciences (UITS)

Department Of CSE

Report

Course Title: Software Project Design and Development

Course Code: CSE 416

Submitted To:
Name: Saima Siddique Tashfia
Lecturer, Dept. of CSE, UITS

Submitted By:
Name: Tanvir Ahmed Apu,
ID: 2125051045
Batch: 50
Section: 7A
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Project Topic: Simple Calculator OS

Simple Calculator OS

1. Introduction

This project creates a basic operating system that can perform simple math calculations like addition, subtraction, multiplication, and division. The OS is made using assembly language for the bootloader and C for the kernel. It uses GRUB to load the OS and runs on emulators like QEMU and VirtualBox. The OS shows a text screen where users can perform calculations.

2. Background

Operating systems are crucial for running computers. Building a simple OS helps us understand how they work. This project focuses on creating a simple calculator OS to learn about bootloaders, kernels, and how an OS interacts with the user. The OS can perform basic tasks showing us how an OS can run calculations.

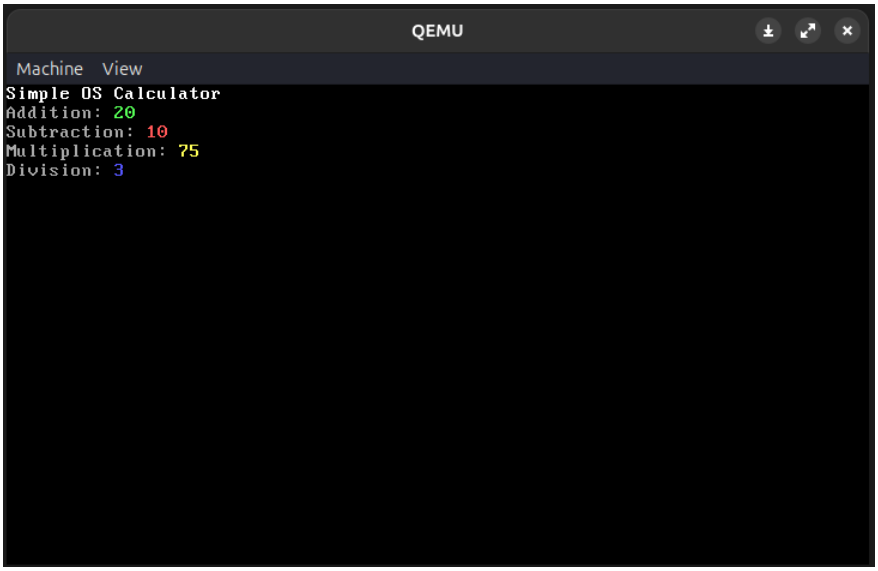
3. Methodology

The project was developed in these key steps:

1. **Installing Tools**:
   The necessary tools were installed:
   - xorriso for creating ISO files.
   - GRUB to load the OS.
   - GCC to compile C code for the kernel.
   - NASM to write the bootloader in assembly.
   - VirtualBox and QEMU for testing the OS.
   - gedit to write the code.
2. **Creating the Bootloader**:
   A multiboot-compliant assembly file was written to boot the OS using GRUB.
3. **Developing the Kernel**:
   The kernel was written in C to handle basic tasks like taking input and performing calculations like addition, subtraction, multiplication, and division.
4. **Linking the Code**:
   The bootloader and kernel were linked together using a linker to create one file that the OS can run from.
5. **Makefile**:
   A Makefile was created to automate the process of compiling and linking the code. This made it easier to build the project with one command.

6. **Test the OS**:
   The OS was tested using QEMU and VirtualBox to ensure that it worked correctly and displayed the calculator functions.

4. Results



The system boots and shows the GRUB menu. The kernel performs basic arithmetic operations like addition, subtraction, multiplication, and division. After booting, the OS shows a screen where users can see the results of their calculations. The OS works correctly on QEMU and VirtualBox.

5. Conclusion

The project demonstrates how to build a basic OS that can perform simple tasks like math calculations. It serves as an introduction to OS development using assembly and C.

Future Work:

- **Keyboard and Mouse Functionality**: Implementing support for keyboard and mouse input will allow for a more interactive user experience.
- **Graphical Interface**: A graphical user interface (GUI) could be developed for a better user experience..
- **Code Optimization**: The code could be optimized for better performance.

6. References

1.Osdev.org

2.Stack Overflow

3.Iknow on YouTube