

Sri Lanka Institute of Information technology

BSc (Hons) in Information Technology - 2022



IE2032-Secure Operating System

Cyber Security - Year 2, Semester 1

Assignment Brief

Write a report on how a modern language like Rust can be used to implement more secure, reliable, high-performance operating system.

Objective:

The main objective of the assignment is to find out how a modern operating system can be build using a modern programming language like “RUST”. The language selection is “Rust”. Rust is one of the best choices in simulating and setting up a modern reliable, secure high performing operating system. Students would get and in-depth knowledge about how modern languagelike rust can be used to develop an operating system.

Introduction to RUST Language

Performance

Rust is blazingly fast and memory-efficient: with no runtime or garbage collector, it can power performance-critical services, run on embedded devices, and easily integrate with other languages.

Reliability

Rust’s rich type system and ownership model guarantee memory-safety and thread-safety —enabling you to eliminate many classes of bugs at compile-time.

Productivity

Rust has great documentation, a friendly compiler with useful error messages, and top-notch tooling an integrated package manager and build tool, smart multi-editor support with auto-completion and type inspections, an auto-formatter, and more.

Assignment Marks Allocation:20 Marks

Assignment Groups and Submission Guideline

This assessment should be conducted as a group work. You should create a group with 4 members. Only the group leader must submit the final document. Your document must include the details of all the

members. At the end you will have to face a viva and participation of all four members are mandatory. Viva schedule will be published later.

Guideline(checklist)for the Assignment:

Following guideline can be used to completing the assessment. [This is only a sample; you are free to have your own checklist]

- A Freestanding Rust Binary
- A Minimal Rust Kernel
- VGA Text Mode
- Testing
- CPU Exceptions
- Double Faults
- Hardware Interrupts
- Introduction to Paging
- Paging Implementation
- Heap Allocation
- Allocator Designs
- Async/Await

The deadline for the assignment is in 12th week. Actual date and time will be notified later through courseweb.