INFOSOFT IT SOLUTIONS

Training | Projects | Placements

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Kernel RTOS

- **Understanding Basics of Operating Systems**:

  - Familiarize yourself with the fundamental concepts of operating systems like processes, threads, scheduling, memory management, and synchronization.

- **RTOS Concepts**:

  - Learn about the unique characteristics of real-time operating systems, such as deterministic scheduling, minimal latency, and priority-based task management.

- **RTOS Kernel Architecture**:

  - Study the architecture and internals of popular RTOS kernels like FreeRTOS, µC/OS, ThreadX, or Zephyr. Understand how tasks, scheduling, interrupts, and inter-task communication are managed.

- **RTOS APIs and Services**:

- Explore the APIs and services provided by RTOS kernels for task management, synchronization, communication, memory management, and timing.

□ **RTOS Porting and Configuration**:

- Learn how to port RTOS kernels to different hardware platforms and configure them according to specific application requirements.

□ **RTOS Application Development**:

- Practice developing applications using RTOS services, including task creation, synchronization primitives (semaphores, mutexes), inter-task communication (queues, mailboxes), and memory management.

□ **Real-time Scheduling Algorithms**:

- Dive deeper into real-time scheduling algorithms like Rate Monotonic Scheduling (RMS), Earliest Deadline First (EDF), and Fixed Priority Pre-emptive Scheduling (FPPS).

□ **RTOS Debugging and Optimization**:

- Master techniques for debugging and optimizing real-time applications, including analyzing task scheduling behavior, identifying and resolving priority inversions, and optimizing resource utilization.

☐ **RTOS Testing and Verification**:

- Explore strategies for testing and verifying real-time applications, including unit testing, integration testing, and system-level testing under various real-time scenarios.

☐ **RTOS Security and Safety Considerations**:

- Understand security and safety considerations specific to real-time systems, such as memory protection, access control, and fault tolerance.

☐ **RTOS Integration with Hardware**:

- Learn how to integrate RTOS kernels with hardware peripherals and device drivers, including configuring interrupts, managing DMA, and interfacing with sensors and actuators.