

Rajshahi University of Engineering & Technology
Department of Computer Science & Engineering
CSE 3202 (Operating Systems Sessional)
Session 2021-22
Lab Project

Important Information

Project Link:	https://github.com/farhan-shakib/kacchiOS
Submission Link:	https://forms.gle/QGRtwtdv4QRtXf1z8
Deadline:	2 days before the Board Viva (This deadline will not be extended further.)

Task:

You are provided with a baremetal OS, kacchiOS, that can boot and start the Null Process. It also contains io.c driver that can read from and write to the console via serial communication.

Your task is to write 3 components:

1. Memory manager:

Processes are going to use memory. The memory manager should allocate memory for processes and free the allocated memory when a process terminates.

2. Process manager:

Processes can be in 3 states—CURRENT, READY, or TERMINATED. You need to write appropriate functions and data structures to facilitate process creation, running, termination, and state transition.

3. Scheduler:

The scheduler must facilitate context switch.

Checklist:

Weights →	Must Include (7 x 10 = 70%)	Good to have (4 x 5 = 20%)	Bonus (4 x 2.5 = 10%)
Memory Manager	<ul style="list-style-type: none">• Stack, Heap allocation	<ul style="list-style-type: none">• Stack deallocation• Heap deallocation	<ul style="list-style-type: none">• Optimized memory allocation
Process Manager	<ul style="list-style-type: none">• Process table• Process creation• State transition• Process termination	<ul style="list-style-type: none">• Utility functions to get process specific functions	<ul style="list-style-type: none">• Add more states• Inter-process communication (IPC)
Scheduler	<ul style="list-style-type: none">• Clear policy to schedule• Context switch	<ul style="list-style-type: none">• Configurable time quantum	<ul style="list-style-type: none">• Implement Aging

Teams:

You are to form a team of 6 students. Each student will be judged for their contribution.

Team naming format: **Series_XX_Section_X_Group_XX**

Submission format:

Upload the project according to given format in GitHub or Google Drive and submit the link.

Series_XX_Section_X_Group_XX _kacchiOS.zip

```
|── src/  
|   ├── memory.c  
|   ├── memory.h  
|   ├── process.c  
|   ├── process.h  
|   ├── scheduler.c  
|   ├── scheduler.h  
|   ├── (other files)  
|   └── Makefile  
└── docs/  
    ├── Checklist.pdf  
    └── Project_Report.pdf  
└── video/  
    └── Demo_Video.mp4  
└── README.md
```