

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/QGRtwdv4QRtXf1z8>
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 deallocationHeap deallocation	<ul style="list-style-type: none">Optimized memory allocation
Process Manager	<ul style="list-style-type: none">Process tableProcess creationState transitionProcess termination	<ul style="list-style-type: none">Utility functions to get process specific functions	<ul style="list-style-type: none">Add more statesInter-process communication (IPC)
Scheduler	<ul style="list-style-type: none">Clear policy to scheduleContext 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
```