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	• Stack, Heap allocation	• Stack deallocation • Heap deallocation	• Optimized memory allocation
Process Manager	• Process table • Process creation • State transition • Process termination	• Utility functions to get process specific functions	• Add more states • Inter-process communication (IPC)
Scheduler	• Clear policy to scedule • Context switch	• Configurable time quantum	• 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
```

⊘ Plagiarism Policy

Zero tolerance for code plagiarism.

Copying from other teams: 0 marks for entire team.

Copying from internet: 0 marks for entire team.

Using AI-generated code: 0 marks for entire team. (You may use AI for understanding).

Collaboration between teams: Not allowed.

Sharing code between teams: Not allowed.