Ankush Kapoor

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Education

Vidyalankar Institute of Technology — **Mumbai, India**
Bachelor of Technology in Computer Engineering — *Sept 2024 – Present*

- CGPA: **10.0** (First Year), SGPA: **10.0** (Sem 3)
- Expected Graduation: **2028**

Seth Hirachand Mutha School (CBSE Board) — **Kalyan, India**

- Class XII - **86%** — 2024
- Class X - **91%** — 2022

Experience

Open World Holidays Framework — **Jan 2025 – June 2025**
Open Source Contributor (GWoC Top 1%) & Paid Contributor — *Remote*

- Achieved **Rank 7 out of 2300+ contributors** in Google Winter of Code (GWoC) '24; top-tier performance led to a **paid sponsored task** to implement **Mongolian holidays**.
- Engineered a **lunar calendar** specifically for **Mongolia**, while extending pre-existing date systems to support complex holiday logic for **India** and **Nepal** to support **249 countries** in a library with **20M+ monthly** PyPI downloads.
- Implemented **localization (l10n)** efforts by implementing Hindi and Mongolian translations, ensuring native-language accessibility for regional users.
- **Technologies:** Python, Pytest, l10n, Git , GitHub

Projects

Transformer From Scratch (Neural Machine Translation) | *Python, PyTorch, CUDA, TensorBoard* — **GitHub**

- Implemented complete **Transformer architecture from scratch** based on **Attention Is All You Need**, using **PyTorch**.
- Built **multi-head self/cross attention**, **encoder–decoder blocks**, **positional encoding**, **feed forward**, **masking**, and **projection layers manually**.
- Trained a bilingual **NMT model** on **OPUS Books** with configurable language pairs, achieving strong translation quality using **greedy** and **beam search decoding**.
- Implemented **learning-rate warmup + inverse square-root decay**, **label smoothing**, checkpointing, and resume logic.
- Evaluated models using **SacreBLEU**, **WER**, and **CER**, with full experiment tracking via **TensorBoard**.

BaseKernel (Custom 32 bit Kernel) | *C, NASM, QEMU, GCC, Linux* — **GitHub**

- Built a **32-bit protected mode** kernel from scratch, **bootstrapped** from **real mode**.
- Implemented **bootloader**, **GDT**, **IDT**, **ISR**, and **IRQ** handling for low-level system control.
- Added **memory paging**, **screen output** along with a **Round Robin scheduler** to enable fair CPU time allocation across tasks.
- Developed entirely without standard libraries to achieve bare-metal execution.

Alloc (Custom Memory Allocator in C) | *C, Linux, NASM, GCC* — **GitHub**

- Created a 32-bit allocator mimicking **malloc()** and **free()** over a 1 GB virtual heap.
- Implemented **alloc(bytes)** to allocate memory in words by taking size in bytes as input.
- Added **destroy()** for secure deallocation with memory zeroing to prevent data leakage, ensuring data privacy.
- Built packed headers, manual tracking, macros for KB/MB/GB allocation, and a **show()** debugger.

Extracurricular Activity

Our Tech Community (OTC) | ourtech.community — **Jul 2025 – Present**
Core Team Member

- Contribute to planning, organizing, and executing OTC's flagship programs including weekly catchups, technical talks.
- Support community operations by assisting with technical setup and maintenance for OTC events to ensure smooth execution and accessible documentation.
- Manage and grow a vibrant, inclusive, and open for all tech-driven community.

Skills

Languages: C, Python, Assembly, Java, MySQL
Developer Tools: Git, GitHub, Makefile, VS Code, Neovim