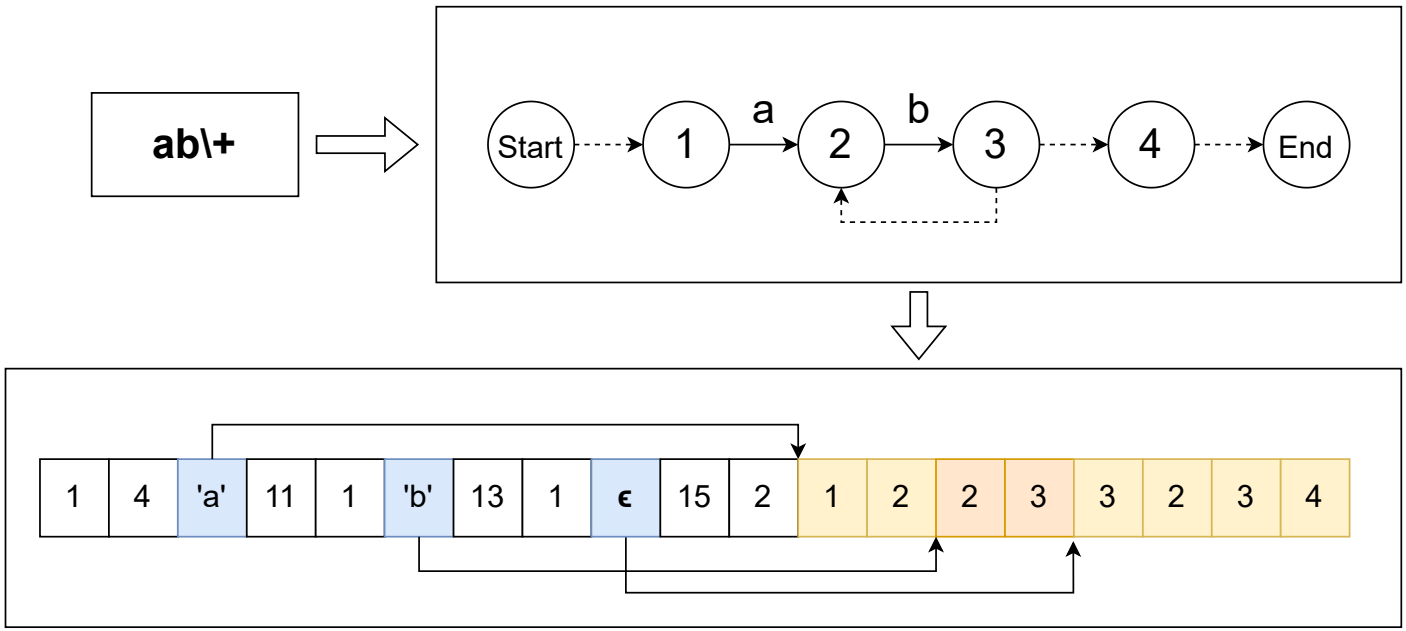
CUDA-Sed

Introduction

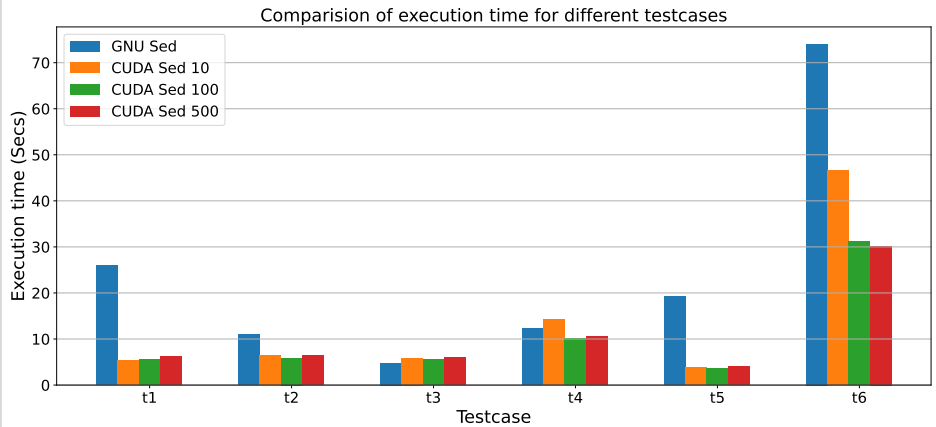
- Objective: Implement a parallel version of Sed
- Main challenge: Regular expression matching
- On CPU, Convert given Regex to NFA
- On GPU, Simulate the NFA for match check and replace



Process and Results

Steps

1. Convert given Regex into NFA using Thompson's algorithm
2. Encode NFA and Copy data to GPU
3. Do pattern matching and replacement on each line
4. Copy results to CPU and print



Challenges

1. **malloc() inside kernel failed when using large number of blocks.**
   Reason: Malloc Heap size limit was too small.
   Solution: Increased cudaLimitMallocHeapSize using cudaDeviceSetLimit()
2. **Very high execution time**
   Reason: malloc'ed memory are present in global memory
   Solution: Removed malloc() from the kernel