Register Allocation Problem

1. Move Insertion aka Split
2. Coalesce
3. Spill
4. Assignment
Graph Coloring: GPU

1. CSR format for Liveness Graph
2. Partition the graph to generate balanced partitions with minimal cross-edges
3. Non-contiguous partitions
4. Each partition is then colored blockwise on GPU
5. All the conflicts between partitions resolved on CPU
Approach 2: Linear Scan

1. Faster algorithm avoids the costly graph building stage
2. Used in JITs, produces lesser quality code compared to graph coloring based allocator
3. Looks inherently sequential
Metrics

1. Number of Spills
2. Running Time
3. Code Size
1. ROSE pass generates the graph for simple programs
2. Graph Coloring GPU
Future Work

1. Compare with other algorithms (SSA-based coloring, lossy allocation)
2. LLVM Backend
3. Compare with optimized multicore code