

Local Register Allocation

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1 Introduction

Register allocation is one of the most important steps in compiler design. As a result of the high cost of accessing data through memory, appropriate register utilization is vital for the generation of good code. We want to map an unbounded number of variables into a very limited number of physical registers, and we want to do so efficiently. Unfortunately, this problem is known to be NP-complete which prevents us from generating perfectly optimal allocations without hurting the performance of our compiler. We will look into four different heuristics and algorithms that we can use to efficiently approximate this problem.