## A cut of an LLVM function that serves as the specification in Minotaur's synthesis procedure define $<4 \times i1> @src(<4 \times i32> %x, <4 \times i32> %y) {$ entry: %0 = icmp eq < 4 x i32> %x, %y%1 = icmp ne < 4 x i32 > %x, %y $%2 = \text{shufflevector} < 4 \times i1 > %0, < 4 \times i1 > %1, < 4 \times i32 > < i32 0, i32 5, i32 2, i32 7 >$ ret <4 x i1> %2 왕X %Y 왕X % y generate candidate 응X 앙y icmp icmp literal eq eq icmp icmp generate candidate mask no literal constants eq ne run translation validation xor return value mismatch candidate is discarded shuffle has literal constant vector many more candidates emit exist-forall query ∃ %literal, ∀ %x, %y. src => tgt , find model ret %literal = <i1 0, i1 1, i1 0, i1 1> rewrite Synthesized LLVM function that refines the original cut define $<4 \times i1> 0 tgt (<4 \times i32> %x, <4 \times i32> %y) {$ entry: %0 = icmp eq < 4 x i32 > %x, %y%1 = xor < 4 x i1 > %1, < i1 0, i1 1, i1 0, i1 1 > %1ret <4 x i1> %1