# Live Variable Analysis UI

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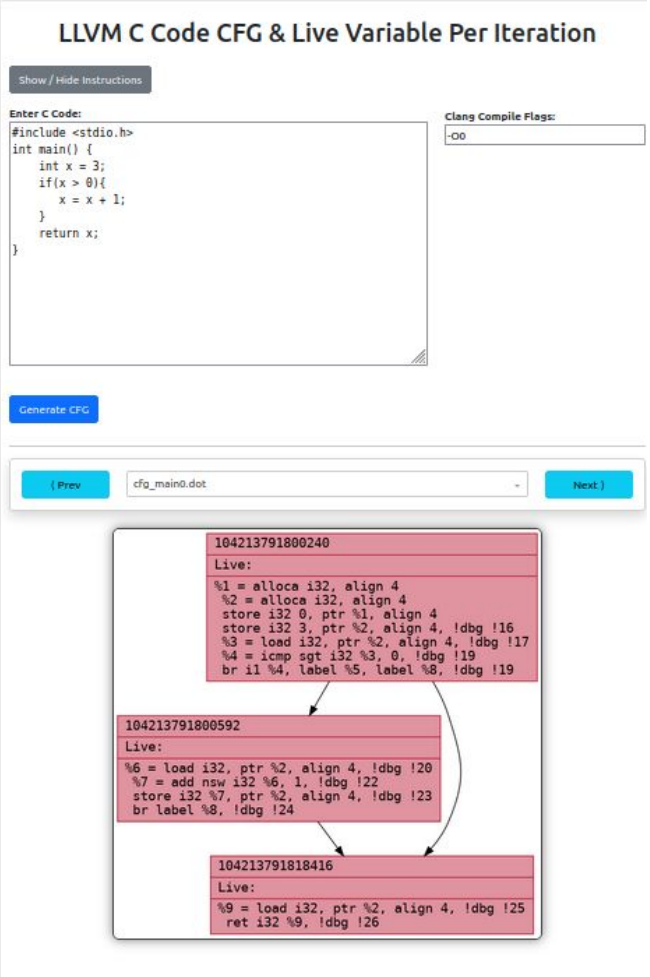
# Creating Educational UI for CFG and Live Variable Analysis

- Frontend is in Python Dash which is an interactive web application framework
- C Code is input by user in frontend
  - Python uses clang on the backend to lower C code to LLVM IR
  - This is passed through our live variable LLVM Pass
- LLVM Pass to generate information per iteration
  - Changes in information populated into graphviz dot file format
- Python graphviz renders .dot files
- Provided a slot to give clang flags in case higher optimization levels want to be seen in CFG (Or other flags)

AI assistance in UI code

# Challenges & Final Setup




- Changes such as DbgVariableRecord not present in LLVM-14, but part of LLVM-20. Upgraded to LLVM-20 by installing from [llvm.sh]
- Generation of CFG manually slightly painful but not too hard