```
////////////////////////////////////////////////////////////////////////////
// 15-745 S14 Assignment 3
// Group: bhumbers, psuresh
////////////////////////////////////////////////////////////////////////////

//Tests LICM for nested loops

int main(void)
{
  int x = 5;
  int y = 1;
  int r = 10;
  for (int i = 0; i < 2*x; i++) {
    for (int j = 0; j < 12345*y; j++) {
      r += y;
    }
  }
  return r;
};
```

```
; ModuleID = 'nested_main.bc'
target datalayout = "e-p:64:64:64-i1:8:8-i8:8:8-i16:16:16-i32:32:32-i64:64:64-f32:32:32-f64:64:64-v64:64:64-v128:128:128-a0:0:64-s0:64
:64-f80:128:128-n8:16:32:64-S128"
target triple = "x86_64-unknown-linux-gnu"

; Function Attrs: nounwind uwtable
define i32 @main() #0 {
entry:
  br label %for.cond

for.cond:                                         ; preds = %for.inc5, %entry
  %r.0 = phi i32 [ 10, %entry ], [ %r.1, %for.inc5 ]
  %i.0 = phi i32 [ 0, %entry ], [ %inc6, %for.inc5 ]
  %mul = mul nsw i32 2, 5
  %cmp = icmp slt i32 %i.0, %mul
  br i1 %cmp, label %for.body, label %for.end7

for.body:                                         ; preds = %for.cond
  br label %for.cond1

for.cond1:                                        ; preds = %for.inc, %for.body
  %r.1 = phi i32 [ %r.0, %for.body ], [ %add, %for.inc ]
  %j.0 = phi i32 [ 0, %for.body ], [ %inc, %for.inc ]
  %mul2 = mul nsw i32 12345, 1
  %cmp3 = icmp slt i32 %j.0, %mul2
  br i1 %cmp3, label %for.body4, label %for.end

for.body4:                                        ; preds = %for.cond1
  %add = add nsw i32 %r.1, 1
  br label %for.inc

for.inc:                                          ; preds = %for.body4
  %inc = add nsw i32 %j.0, 1
  br label %for.cond1

for.end:                                          ; preds = %for.cond1
  br label %for.inc5

for.inc5:                                         ; preds = %for.end
  %inc6 = add nsw i32 %i.0, 1
  br label %for.cond

for.end7:                                         ; preds = %for.cond
  ret i32 %r.0
}

attributes #0 = { nounwind uwtable "less-precise-fpmad"="false" "no-frame-pointer-elim"="true" "no-frame-pointer-elim-non-leaf" "no-in
fs-fp-math"="false" "no-nans-fp-math"="false" "stack-protector-buffer-size"="8" "unsafe-fp-math"="false" "use-soft-float"="false" }

!llvm.ident = !{!0}

!0 = metadata !{metadata !"clang version 3.4 (tags/RELEASE_34/final)"}
```

```
; ModuleID = 'nested_main-opt.bc'
target datalayout = "e-p:64:64:64-i1:8:8-i8:8:8-i16:16:16-i32:32:32-i64:64:64-f32:32:32-f64:64:64-v64:64:64-v128:128:128-a0:0:64-s0:64
:64-f80:128:128-n8:16:32:64-S128"
target triple = "x86_64-unknown-linux-gnu"

; Function Attrs: nounwind uwtable
define i32 @main() #0 {
entry:
  %mul = mul nsw i32 2, 5
  br label %for.cond

for.cond:                                         ; preds = %for.inc5, %entry
  %r.0 = phi i32 [ 10, %entry ], [ %r.1, %for.inc5 ]
  %i.0 = phi i32 [ 0, %entry ], [ %inc6, %for.inc5 ]
  %cmp = icmp slt i32 %i.0, %mul
  br i1 %cmp, label %for.body, label %for.end7

for.body:                                         ; preds = %for.cond
  %mul2 = mul nsw i32 12345, 1
  br label %for.cond1

for.cond1:                                        ; preds = %for.inc, %for.body
  %r.1 = phi i32 [ %r.0, %for.body ], [ %add, %for.inc ]
  %j.0 = phi i32 [ 0, %for.body ], [ %inc, %for.inc ]
  %cmp3 = icmp slt i32 %j.0, %mul2
  br i1 %cmp3, label %for.body4, label %for.end

for.body4:                                        ; preds = %for.cond1
  %add = add nsw i32 %r.1, 1
  br label %for.inc

for.inc:                                          ; preds = %for.body4
  %inc = add nsw i32 %j.0, 1
  br label %for.cond1

for.end:                                          ; preds = %for.cond1
  br label %for.inc5

for.inc5:                                         ; preds = %for.end
  %inc6 = add nsw i32 %i.0, 1
  br label %for.cond

for.end7:                                         ; preds = %for.cond
  ret i32 %r.0
}

attributes #0 = { nounwind uwtable "less-precise-fpmad"="false" "no-frame-pointer-elim"="true" "no-frame-pointer-elim-non-leaf" "no-in
fs-fp-math"="false" "no-nans-fp-math"="false" "stack-protector-buffer-size"="8" "unsafe-fp-math"="false" "use-soft-float"="false" }

!llvm.ident = !{!0}

!0 = metadata !{metadata !"clang version 3.4 (tags/RELEASE_34/final)"}
```