

```
entry:
    %xmmx = alloca i32**, align 8
    %mmtx = alloca i32**, align 8
    %imdx = alloca i32**, align 8
    %ndmx = alloca i32**, align 8
    %c0 = bitcast i32***%xmmx to i8**
    call void @llvm.lifetime.start.p0i8(64 * 8, i8*, nonnull #0) #8
    %M1 = bitcast i32***%mmtx to i8**
    call void @llvm.lifetime.start.p0i8(64 * 8, i8*, nonnull #1) #8
    %c2 = bitcast i32***%imdx to i8**
    call void @llvm.lifetime.start.p0i8(64 * 8, i8*, nonnull #2) #8
    %c3 = bitcast i32***%ndmx to i8**
    call void @llvm.lifetime.start.p0i8(64 * 8, i8*, nonnull #3) #8
    %M1 = getelementptr inbounds %struct.plan7_s*, %struct.plan7_s*,
        ... , i32, 20
    %c4 = load (i32, i32** M1), align 8, !tbaa 13
    call void @ReshapePlan_Matrix(%struct.dpmatrix_s*, %noundef%xmm, i32 noundef
        ..., i32, i32 noundef %4, i32*** noundef nonnull %xmm, i32*** noundef nonnull %mmtx,
        ..., i32*** noundef nonnull %imdx, i32*** noundef nonnull %ndmx)
    store i32 %c4, i32***%xmm, align 8, !tbaa 110
    %c6 = load i32*, i32** %c5, align 8, !tbaa 110
    %arrayidx2 = getelementptr inbounds i32, i32** %c6, i64 4
    store i32 0, i32* %arrayidx2, align 4, !tbaa 110
    %arrayidx4 = getelementptr inbounds %struct.plan7_s*, %struct.plan7_s*,
        ... , i64 4, i32, 33, i64, i64 0
    %c7 = load i32, i32** %arrayidx2, align 8, !tbaa 111
    store i32 %c7, i32** %arrayidx4, align 8, !tbaa 111
    %arrayidx8 = getelementptr inbounds i32, i32** %c6, i64 3
    store i32 -987654321, i32* %arrayidx8, align 4, !tbaa 111
    %arrayidx12 = getelementptr inbounds i32, i32** %c6, i64 1
    store i32 -987654321, i32* %arrayidx12, align 4, !tbaa 111
    %c8 = load i32, i32** M1, align 8, !tbaa 13
    %cmp.not546 = icmp slt i32 %c8, 0
    br i1 %cmp.not546, label %for.end, label %for.body.lr.ph

; Loop body
T                                     F
┌───────────┴───────────┐
│                                                                   │
│   for.body.lr.ph:                                                 │
│   %9 = load i32*, i32***%dmx, align 8, !tbaa 110                │
│   %10 = load i32*, i32***%g, align 8, !tbaa 110                 │
│   %11 = load i32*, i32***%l, align 8, !tbaa 110                  │
│   %12 = load i32*, i32***%r, align 8, !tbaa 110                  │
│   %13 = load i32*, i32***%xmm, align 8, !tbaa 110               │
│   %14 = load i32*, i32***%c13, align 8, !tbaa 110               │
│   br label %for.body                                              │
│                                                                   │
│   for.body:                                                        │
│   ... phi(i64 %0, %cond.branch.op, i1 %ifcond.true)              │

```

T	F
<pre> x18 = getelementptr inbounds i32, i32* %tbaa, i64 %in -987654321, i32* %arrayidx18, align 4, !tbaa !1 x21 = getelementptr inbounds i32, i32* %tbaa, i64 %in -987654321, i32* %arrayidx21, align 4, !tbaa !1 i1v.next = add nuw nsw i64 %indsvars.iv, 1 ad i32, i32* %M1, align 8, !tbaa !3 xt i32 %t15 to i64 t.not = icmp slt i64 %indsvars.iv, %16 p.not.not, label %for.body, label %for.end, !lvm.loop </pre>	

[illegible]

	T	F
<pre> 132 34 %25 = load i32*, @cmap.%5bcs, align 8, !tbaa.115 %cmp37.not554 = icmp slt i32, %1, %1 br i1 %cmp37.not554, label %for.end351, label %for.body38.lrph </pre>		
		<pre> for.body38.lrph: %msc = getelementptr inbounds %struct.plan7.s, %str ... 132 31 %isc = getelementptr inbounds %struct.plan7.s, %str ... 132 32 %cmp70.not548 = icmp slt i32, %1, %1 %arrayid214 = getelementptr inbounds %struct.plan7.s, %str ... %hhmm, i64 0, i32 23, i64 0, i64 1 %esc = getelementptr inbounds %struct.plan7.s, %str ... 132 35 %arrayid254 = getelementptr inbounds %struct.plan7.s, %str ... %hhmm, i64 0, i32 23, i64 0, i64 1 %arrayid268 = getelementptr inbounds %struct.plan7.s, %str ... %hhmm, i64 0, i32 23, i64 0, i64 1 %arrayid302 = getelementptr inbounds %struct.plan7.s, %str ... %hhmm, i64 0, i32 23, i64 0, i64 0 %arrayid322 = getelementptr inbounds %struct.plan7.s, %str ... %hhmm, i64 0, i32 23, i64 0, i64 1 </pre>

```
%26 = sext i32 %1.cssa.to.i64
%27 = add i32 %1.cssa, 1
%28 = add nuw i32 %L, 1
%wide.trip.count574 = sext i32 %28 to i64
%wide.trip.count = zext i32 %27 to i64
br label %for.body38
```

for.body38:  
 %29 = phi i32\* [ %, %for.body38.lr.ph

[illegible][illegible]

```

%cmpl82 = icmp sgt i32 %select119, %add172
%spec.store.select536 = add nuw nsw %cmpl82, %select179, i32 %add11
store i32 %spec.store.select536, i32* %arrayaddr174, align 4
%arrayaddr189 = getelementptr inbounds i32, i32* %select56, i64 %ndvars.i
%66 = load i32, i32* %arrayaddr189, align 4, !tbaa !1
%select192 = add nuw nsw %select536, i32* %arrayaddr189, i32 %66
%67 = icmp sgt i32 %select192, %shft654321
%spec.store.select541 = select i1 %67, %select192, i32 %shft654321
store i32 %spec.store.select541, i32* %arrayaddr174, align 4
br label %for.inc202

; Loop body
for.inc202:
%ndvars.i.next562 = add nuw nsw i64 %
%exitcond.not = icmp eq i64 %ndvars.i,
br i1 %exitcond.not, label %for.end204.loop
; Loop exit
; ... llvm loop ...

```

```
pexit ], [ %31, %for.body38 ]
pexit ], [ %29, %for.body38 ]
pexit ], [ %30, %for.body38 ]
*, i32** %70, i64 %indvars.iv570
!,tbaa !10
i32* %71, i64 4
```

```

%k72 = load i32, 132, %arrayray221, align 4, tbaa 111
%k73 = load i32, 132, %arrayray221, align 4, tbaa 111
%add215 = add nsw i32 %k73, %k72
%cmp216 = icmp sgt i32 %add215, -987654321
%select11 = select i1 %cmp216, i32 %add215, i32 -987654321
store i32 %select11, store.select.556, i32* %arrayray220, align 4
%arrayray224 = getelementptr inbounds i32*, %select11, %i64, 16, %invars.iv570
%k74 = load i32, 132, %arrayray224, align 8, tbaa 111
%k75 = load i32, 132, %select.556, align 8, tbaa 120
%k76 = load i32, 132, %i61, align 8, tbaa 133
%cmp227.not550 = icmp slt i32 %k76, 1
br i1 %cmp227.not550, label %for.end241, label %for.body229.preheader

```

```


graph TD
    Entry(( )) -- "%k76 < 1" --> Body[for.body229.preheader]
    Entry -- "F" --> Exit(( ))
    Body -- loop --> Body

```

T	F

<pre>%n.vec = and i64 %78, 8 %ind.end = or i64 %n.vec, 1 %79 = add nsw i64 %n.vec, -8 %80 = lshr exact i64 %79, 3 %81 = add nuw nsw i64 %80, 1 %xtreater = and i64 %81, 1 %82 = icmp eq i64 %79, 0 br i1 %82, label %middle.block.unr-icssa, l</pre>	T
--	---

```
vector<int> new:  
%unroll iter = and i64 %81, 46116860184273  
br label %vector.body
```



```
%vec.phi = phi <4 x i32> [ <i32 -987654321, i32 -987654321, i32 -987654321>, %vector.ph.new ], [%i09, %vector.ph.i581]
%vec.phi581 = phi <4 x i32> [ <i32 -987654321, i32 -987654321, i32 -987654321, i32 -987654321>, %vector.ph.new ], [%niter]
%niter = phi i64 [ 0, %vector.ph.new ], [%niter.next.1]
%offset.idx = or i64 [%index, 1]
```

```
%wide.load = load <4 x i32>, <4 x i32>*%84, align 4, !tbaa !11
%85 = getelementptr inbounds i32, i32*%83, i64 4
%86 = bitcast i32*%85 to <4 x i32>*
%wide.load582 = load <4 x i32>, <4 x i32>*%86, align 4, !tbaa !11
%87 = getelementptr inbounds i32, i32*%75, i64 %offset.idx
%88 = bitcast i32*%87 to <4 x i32>*

```

```
%90 = bitcast i32* %89 to <4 x i32>*  
%wide.load584 = load <4 x i32>, <4 x i32>* %90, align 4, !tbaa !11  
%91 = add nsw <4 x i32> %wide.load583, %wide.load  
%92 = add nsw <4 x i32> %wide.load584, %wide.load582  
%93 = icmp sgt <4 x i32> %91, %vec.phi  
%94 = icmp sgt <4 x i32> %92, %vec.phi
```

```
%offset.idx.1 = or i64 %index, 9
%97 = getelementptr inbounds i32, i32* %74, i64 %offset.idx.1
%98 = bitcast i32* %97 to <4 x i32>*
%wide.load.1 = load <4 x i32>, <4 x i32>* %98, align 4, !tbaa !11
%99 = getelementptr inbounds i32, i32* %97, i64 4
%100 = bitcast i32* %99 to <4 x i32>*
```

```
%102 = bitcast i32*%i01 to <4 x i32>*
%wide.load583.1 = load <4 x i32>, <4 x i32>*%i02, align 4, !tbaa !l1
%i03 = getelementptr inbounds i32, i32*%i01, i64 4
%i04 = bitcast i32*%i03 to <4 x i32>*
%wide.load584.1 = load <4 x i32>, <4 x i32>*%i04, align 4, !tbaa !l1
```

```
%i07 = icmp sgt <4 x i32> %i03, %i05
%i08 = icmp sgt <4 x i32> %i06, %i06
%i09 = select <4 x i1> %i07, <4 x i32> %i05, <4 x i32> %i05
%i10 = select <4 x i1> %i08, <4 x i32> %i06, <4 x i32> %i06
%index.next.1 = add nuw i64 %index, 16
%niter.next.1 = add i64 %niter, 2
```

```

graph TD
    T[T] -- true --> T
    T -- false --> F[F]
    F -- true --> T
  
```

```

pdir <4 x i32> [ <int0, %vector.ph.i, [%109, %vector.body]
i64 [ 0, %vector.ph ], [%index.next.1, %vector.body]
hi <4 x i32> [ <i32 -987654321, i32 -987654321, i32
2 -987654321>, %vector.ph ], [%109, %vector.body]
= phi <4 x i32> [ <i32 -987654321, i32 -987654321, i32
2 -987654321>, %vector.ph ], [%110, %vector.body]

```

```
vector.body.epil:
  %offset_idx_epil = or i64 %index, unr_1
```

```
%wide.load.epil = load <4 x i32>, <4 x i32>*%112, align 4, !tbaa !11
%113 = getelementptr inbounds i32, i32*%111, i64 4
%114 = bitcast i32*%113 to <4 x i32>*
%wide.load582.epil = load <4 x i32>, <4 x i32>*%114, align 4, !tbaa !11
%115 = getelementptr inbounds i32, i32*%75, i64 %offset.idx.epil
%116 = bitcast i32*%115 to <4 x i32>*
%117 = bitcast <4 x i32>*%117 to i32
```

```
%117 = getelementptr @inbounds %i32, %i32 @%115, 1644
%118 = bitcast %i32* %117 to <4 x i32>*
%wide.load584.epil = load <4 x i32>, <4 x i32>* %118, align 4, !tbaa !11
%119 = add nsw <4 x i32> %wide.load583.epil, %wide.load.epil
%120 = add nsw <4 x i32> %wide.load584.epil, %wide.load582.epil
%121 = icmp sgt <4 x i32> %119, %vec.phi.unr
```

```
%124 = select <4 x i1> %122, <4 x i32> %120, <4 x i32> %vec.prim361.unr  
br label %middle.block
```

```

586 = phi <4 x i32> %lcssa586.ph, %middle.block.unr.lcssa [,
    , %vector.body.epil ]
inmax.cmp = icmp sgt <4 x i32> %lcssa587, %lcssa586
inmax.select = select <4 x i1> %rdx.minmax.cmp, <4 x i32> %lcssa587,
i32> %lcssa586
= call @llvm.vector.reduce.smax.v4i32(<4 x i32> %rdx.minmax.select)

```

The diagram shows a horizontal bar divided into two sections. The left section is labeled 'T' and the right section is labeled 'F'. A curved arrow originates from the bottom of the 'T' section and points to the bottom of the 'F' section.

, %for.bodyZ29.preheader ], [ %125,

s i32, i32\* %74, i64 %indvars.iv565  
gn 4, !tbaa !11  
s i32, i32\* %75, i64 %indvars.iv565

```
me.0551
i32 %add234, i32 %xme.0551
%indvars.iv565, 1
vars.iv.next566, %wide.trip.count568
41, label %for.body229, !lvm.loop !23
```

```

, %middle.block ],

```

A vertical line is drawn, with a blue arrow pointing downwards to the boundary of the orange region.

32-987654321

```
2*%133,i64 2
4,!tbaa !11
32**%132,i64 %37
@.str.110
```

```
%add324, i32 -987654321
316, align 4
```

```

add:11
    .select557
    %add338,i32
    316, align 4

```

5  
F

```
body38 crit edge:
i32*, i32** %arrayidx298, align 8, !tbaa !l0
body38
```