NoAlias.c

```
int foo(int32_t a){
    int8_t *p = (int8_t *) &a;
    p[0] = 77;
    int8_t b = p[1];
    int8_t c = p[2];
    return 76;
}
```

NoAlias.c

```
int foo(int32_t a){
    int8_t *p = (int8_t *) &a;
    p[0] = 77;
    int8_t b = p[1];
    int8_t c = p[2];
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NoAlias.c

```
int foo(int32_t a){
    int8_t *p = (int8_t *) &a;
    p[0] = 77;
    int8_t b = p[1];
    int8_t c = p[2];
    return 76;
}
```

```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4
  %3 = alloca i8*, align 8
  %4 = alloca i8, align 1
  %5 = alloca i8, align 1
  store i32 %0, i32* %2, align 4, !tbaa !5
  %6 = bitcast i8** %3 to i8*
  call void @llvm.lifetime.start.p0i8(i64 8, i8* %6) #2
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  call void @llvm.lifetime.start.p0i8(i64 1, i8* %4) #2
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  call void @llvm.lifetime.start.p0i8(i64 1, i8* %5) #2
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  call void @llvm.lifetime.end.p0i8(i64 1, i8* %5) #2
  call void @llvm.lifetime.end.p0i8(i64 1, i8* %4) #2
  %16 = bitcast i8** %3 to i8*
  call void @llvm.lifetime.end.p0i8(i64 8, i8* %16) #2
  ret i32 76
}
```

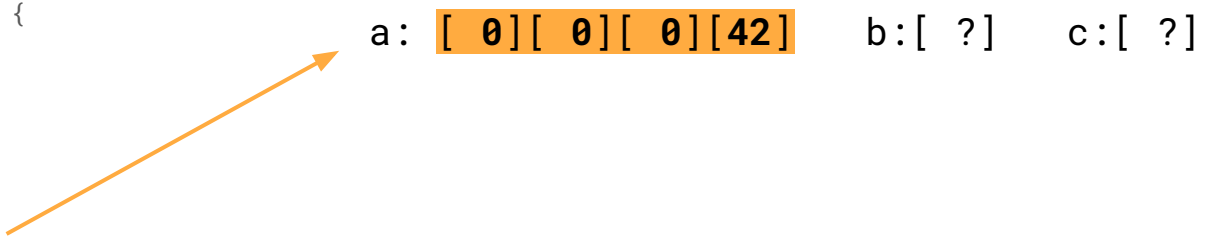
```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %6 = bitcast i8** %3 to i8*
  call void @llvm.lifetime.start.p0i8(i64 8, i8* %6) #2
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  call void @llvm.lifetime.start.p0i8(i64 1, i8* %4) #2
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  call void @llvm.lifetime.start.p0i8(i64 1, i8* %5) #2
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  call void @llvm.lifetime.end.p0i8(i64 1, i8* %5) #2
  call void @llvm.lifetime.end.p0i8(i64 1, i8* %4) #2
  %16 = bitcast i8** %3 to i8*
  call void @llvm.lifetime.end.p0i8(i64 8, i8* %16) #2
  ret i32 76
}
```

```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```

```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```

a: [?][?][?][?] b:[?] c:[?]

```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```



```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```

```
a: [ 0][ 0][ 0][42]   b:[ ?]   c:[ ?]
%2 ^^^^^^^^^^^^^^^^   %4^^^^   %5^^^^

a: [ 0][ 0][ 0][42]
%7 ^^^^
```

```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```

```
a: [ 0][ 0][ 0][42]   b:[ ?]   c:[ ?]
%2 ^^^^^^^^^^^^^^^^   %4^^^^   %5^^^^

a: [ 0][ 0][ 0][42]
%7 ^^^^

a: [ 0][ 0][ 0][42]
%7 ^^^^
%3^^
```

```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
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  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
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  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```

%8 ~ %7

```
a: [ 0][ 0][ 0][42]   b:[ ?]   c:[ ?]
%2 ^^^^^^^^^^^^^^^^   %4^^^^   %5^^^^

a: [ 0][ 0][ 0][42]
%7 ^^^^

a: [ 0][ 0][ 0][42]
%7 ^^^^
%3^^          ...
```

```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
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  %4 = alloca i8, align 1   // b
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  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```

%8 ~ %7
%9 ~ %8 + 0

```
a: [ 0][ 0][ 0][42]   b:[ ?]   c:[ ?]
%2 ^^^^^^^^^^^^^^^^   %4^^^^   %5^^^^

a: [ 0][ 0][ 0][42]
%7 ^^^^

a: [ 0][ 0][ 0][42]
%7 ^^^^
%3^^          ...
```

```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
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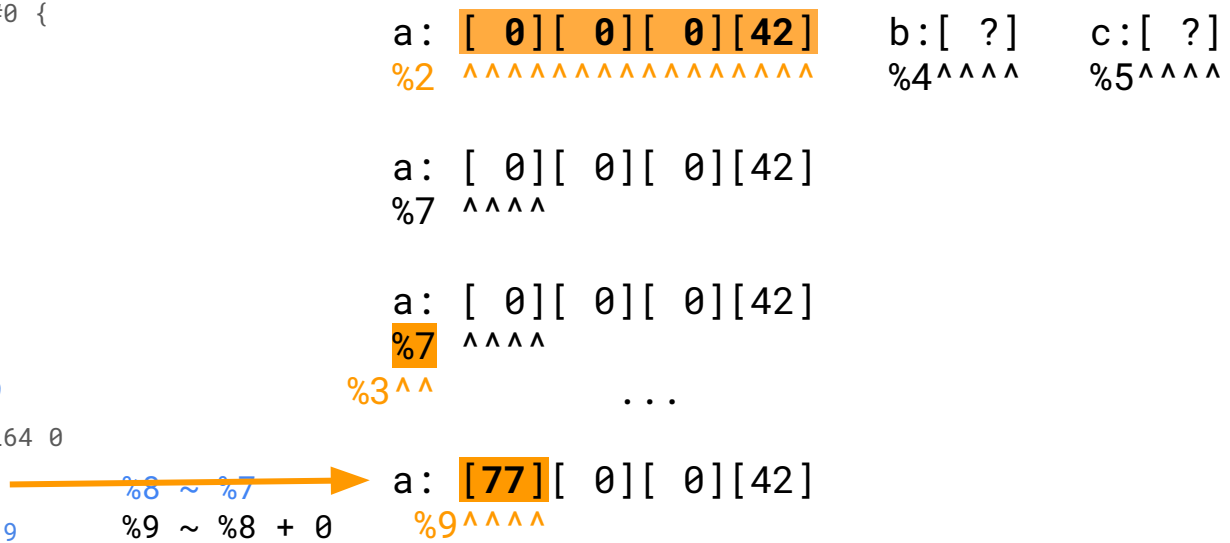
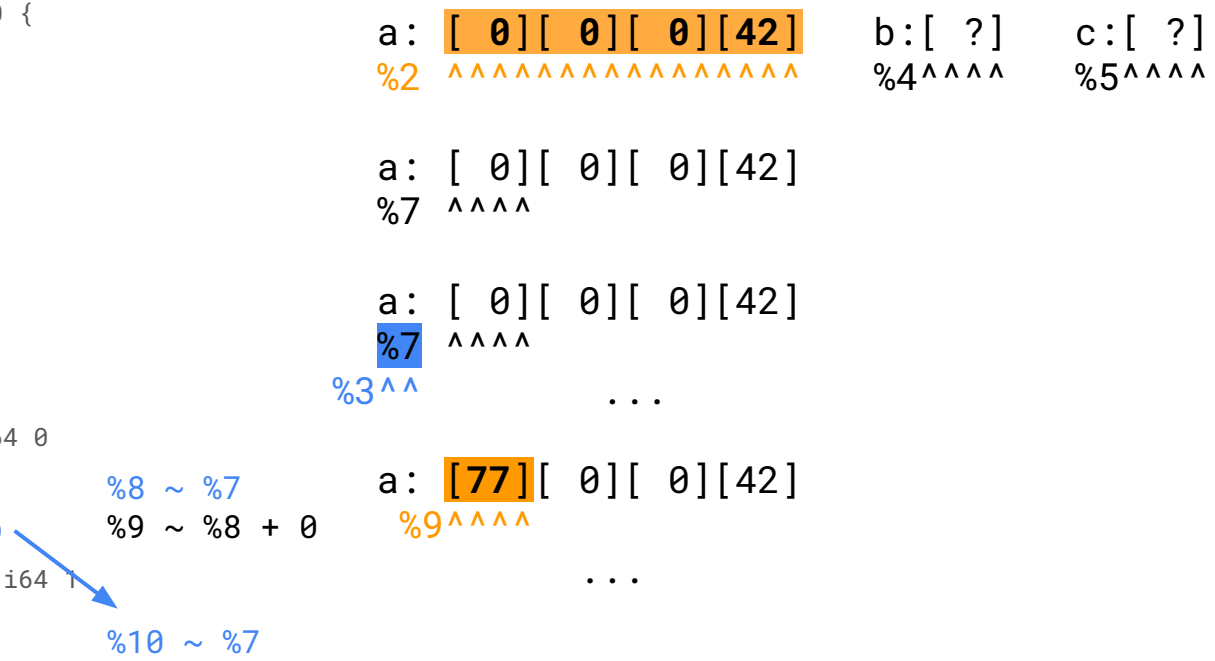
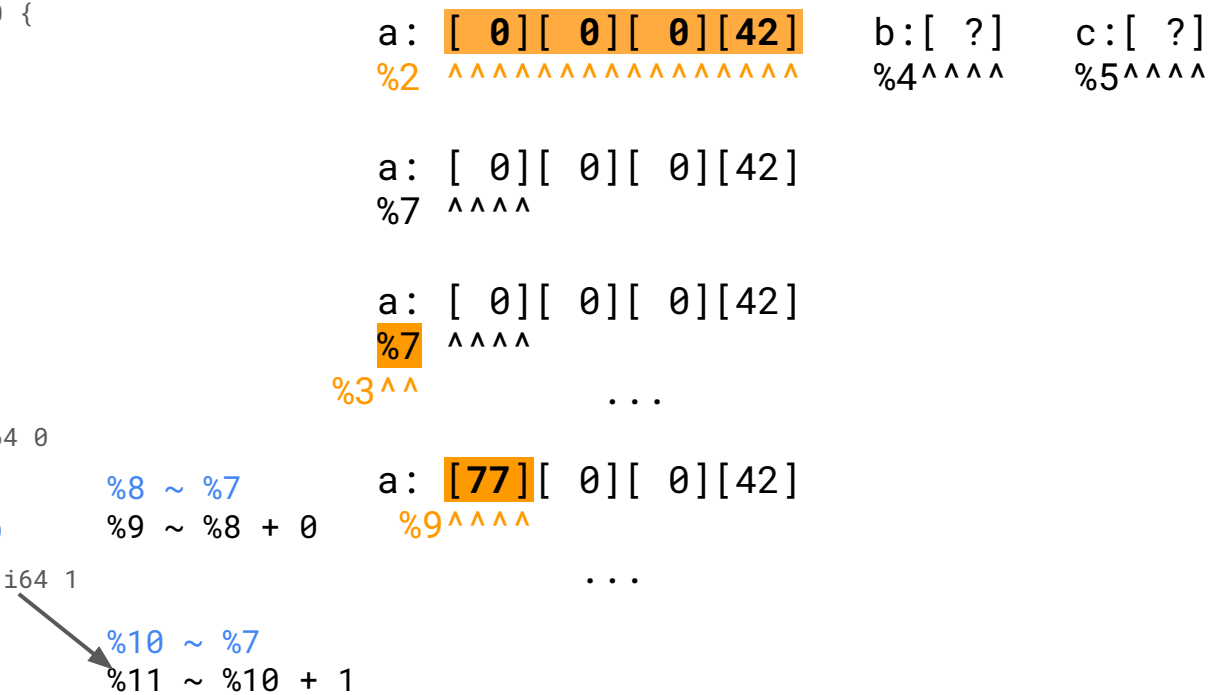
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```



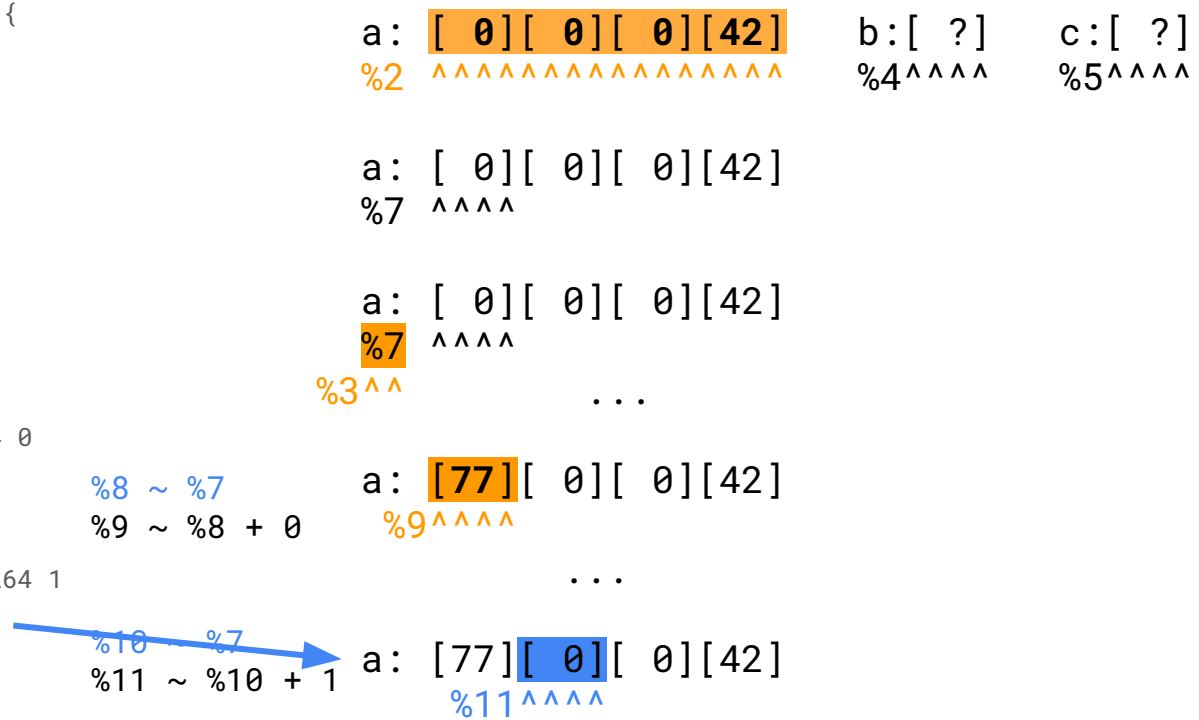
```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```



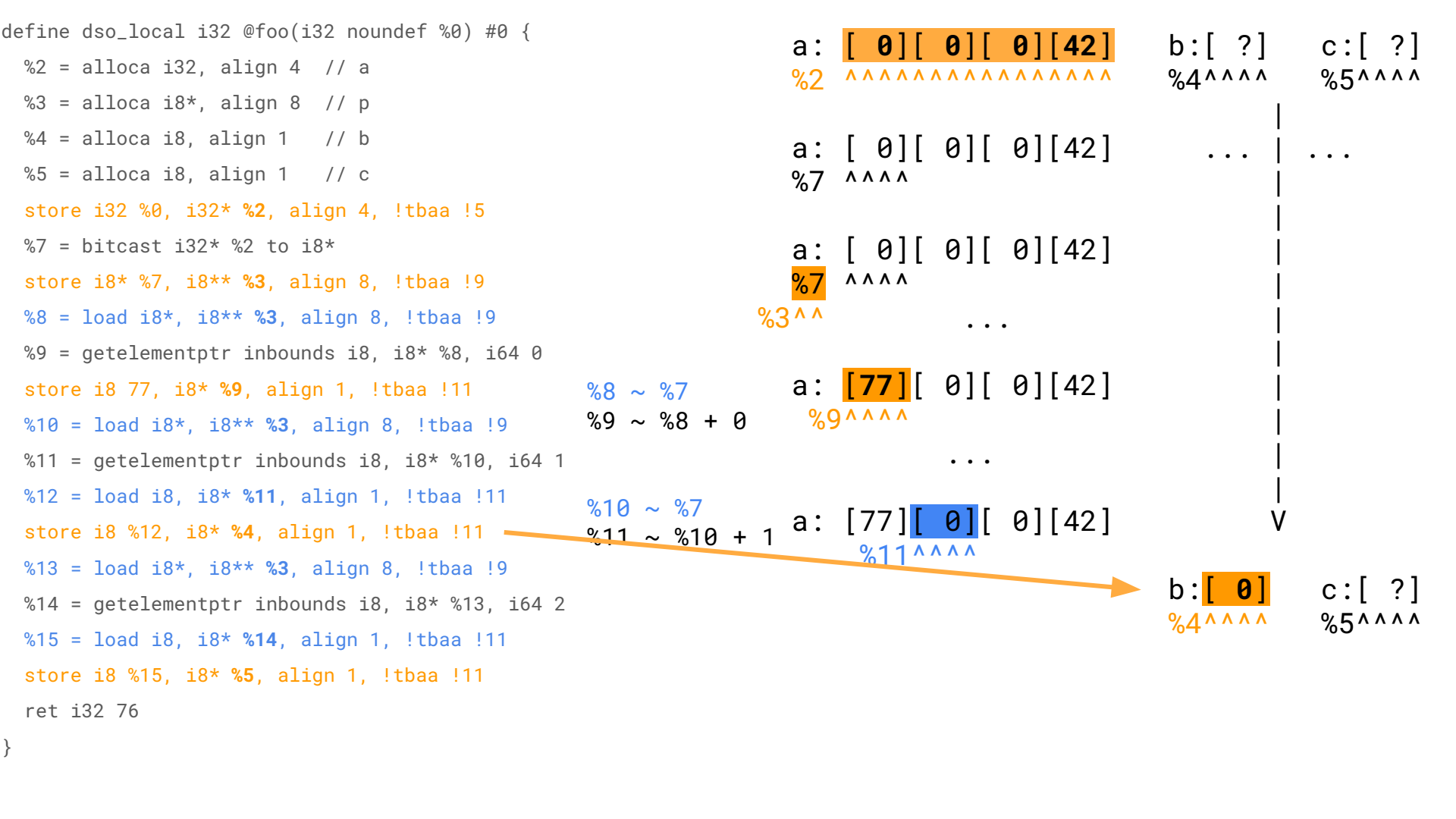
```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```



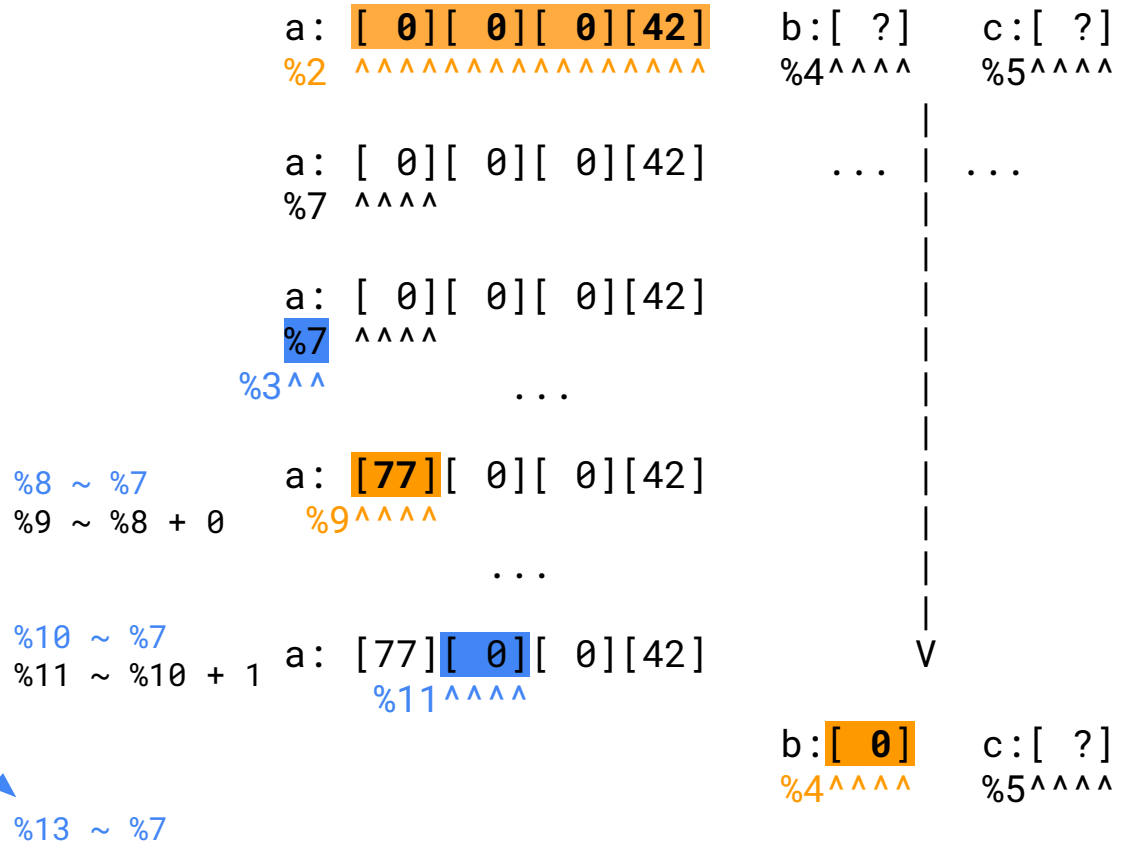
```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```



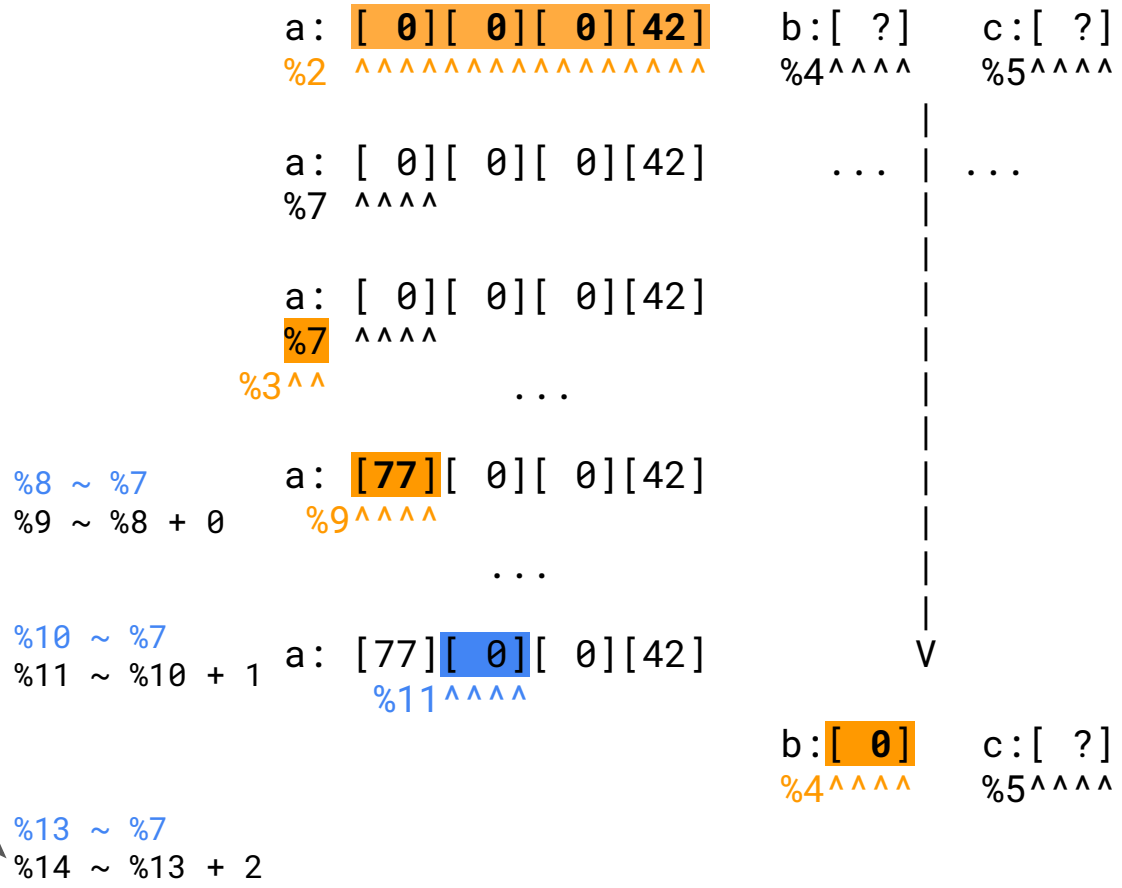
```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```



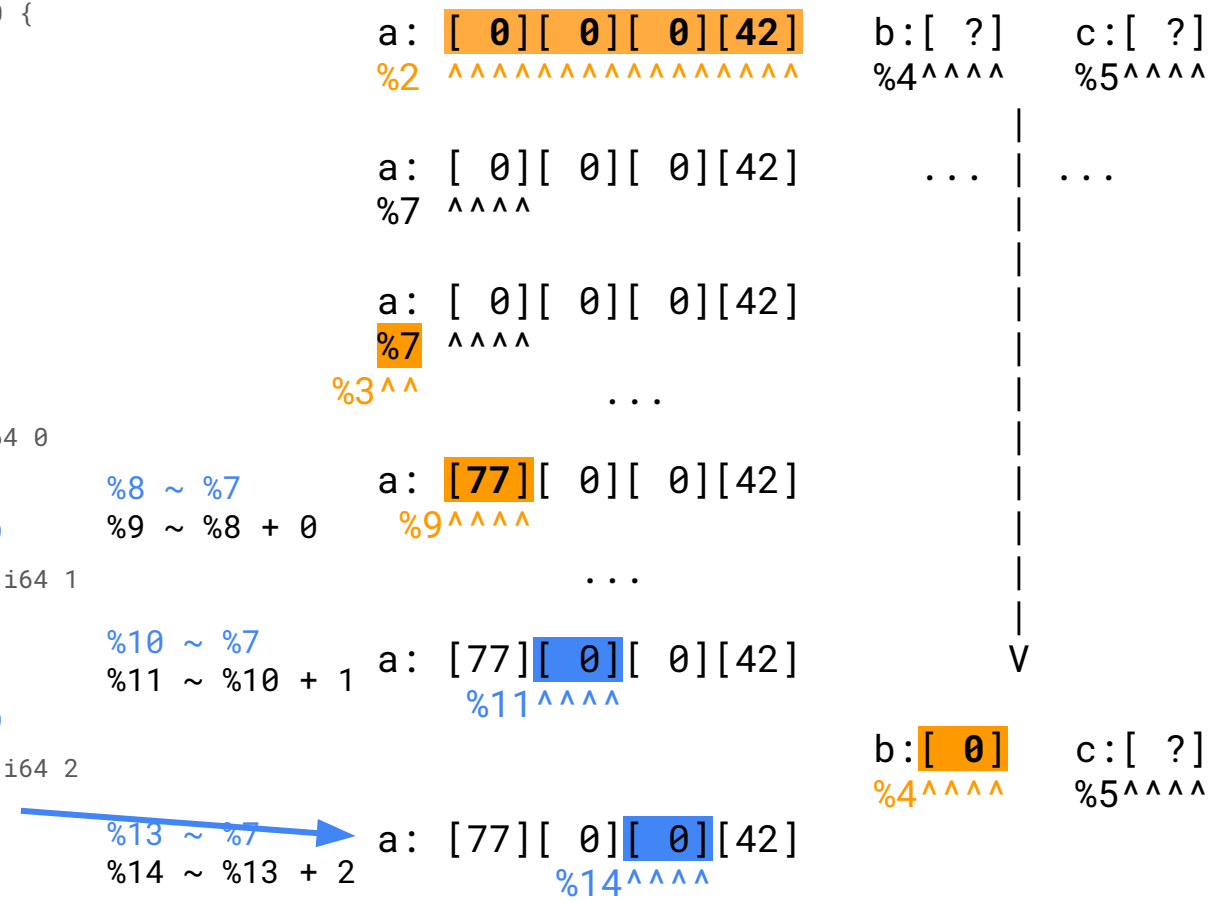
```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```



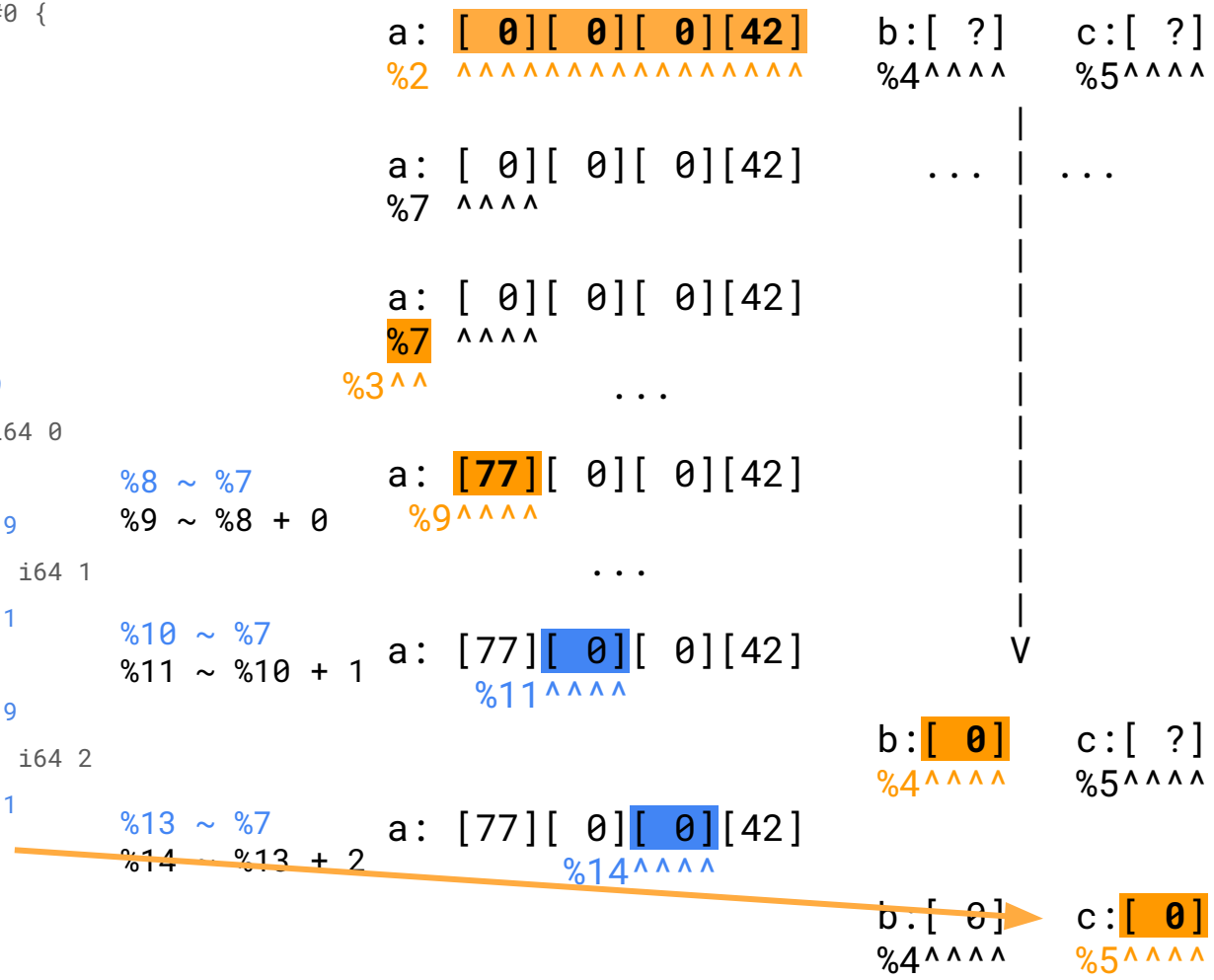
```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```



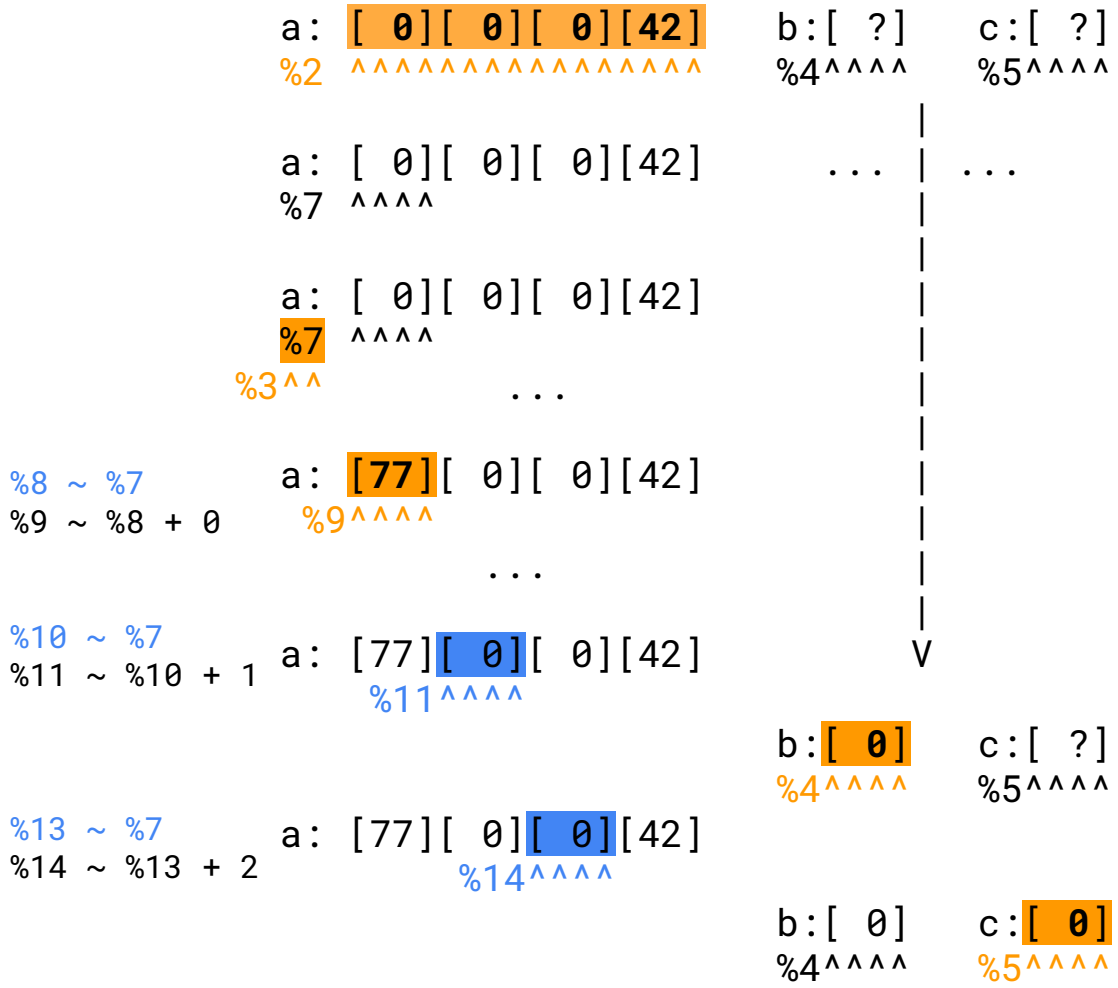
```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```



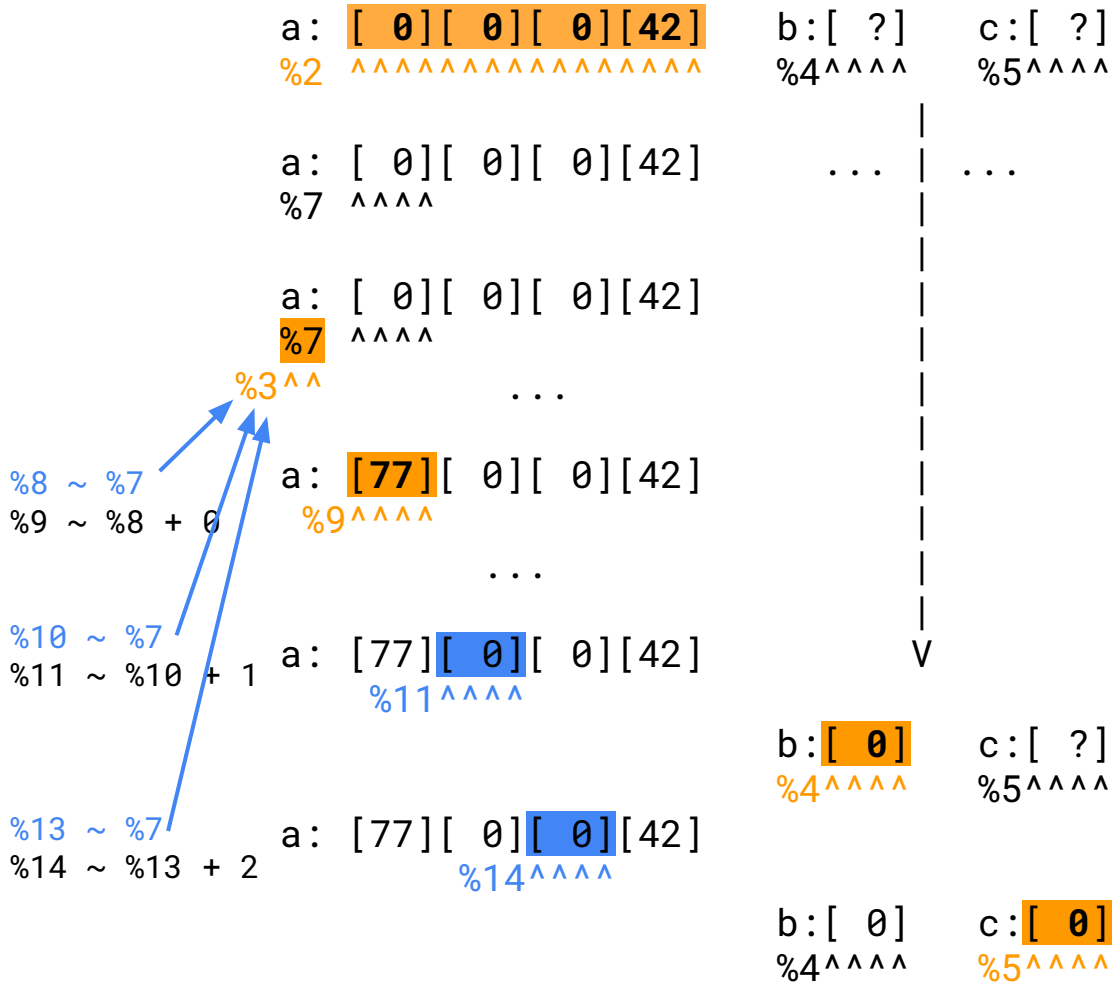
```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```



```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```



```
define dso_local i32 @foo(i32 noundef %0) #0 {
  %2 = alloca i32, align 4  // a
  %3 = alloca i8*, align 8  // p
  %4 = alloca i8, align 1   // b
  %5 = alloca i8, align 1   // c
  store i32 %0, i32* %2, align 4, !tbaa !5
  %7 = bitcast i32* %2 to i8*
  store i8* %7, i8** %3, align 8, !tbaa !9
  %8 = load i8*, i8** %3, align 8, !tbaa !9
  %9 = getelementptr inbounds i8, i8* %8, i64 0
  store i8 77, i8* %9, align 1, !tbaa !11
  %10 = load i8*, i8** %3, align 8, !tbaa !9
  %11 = getelementptr inbounds i8, i8* %10, i64 1
  %12 = load i8, i8* %11, align 1, !tbaa !11
  store i8 %12, i8* %4, align 1, !tbaa !11
  %13 = load i8*, i8** %3, align 8, !tbaa !9
  %14 = getelementptr inbounds i8, i8* %13, i64 2
  %15 = load i8, i8* %14, align 1, !tbaa !11
  store i8 %15, i8* %5, align 1, !tbaa !11
  ret i32 76
}
```



Function foo:

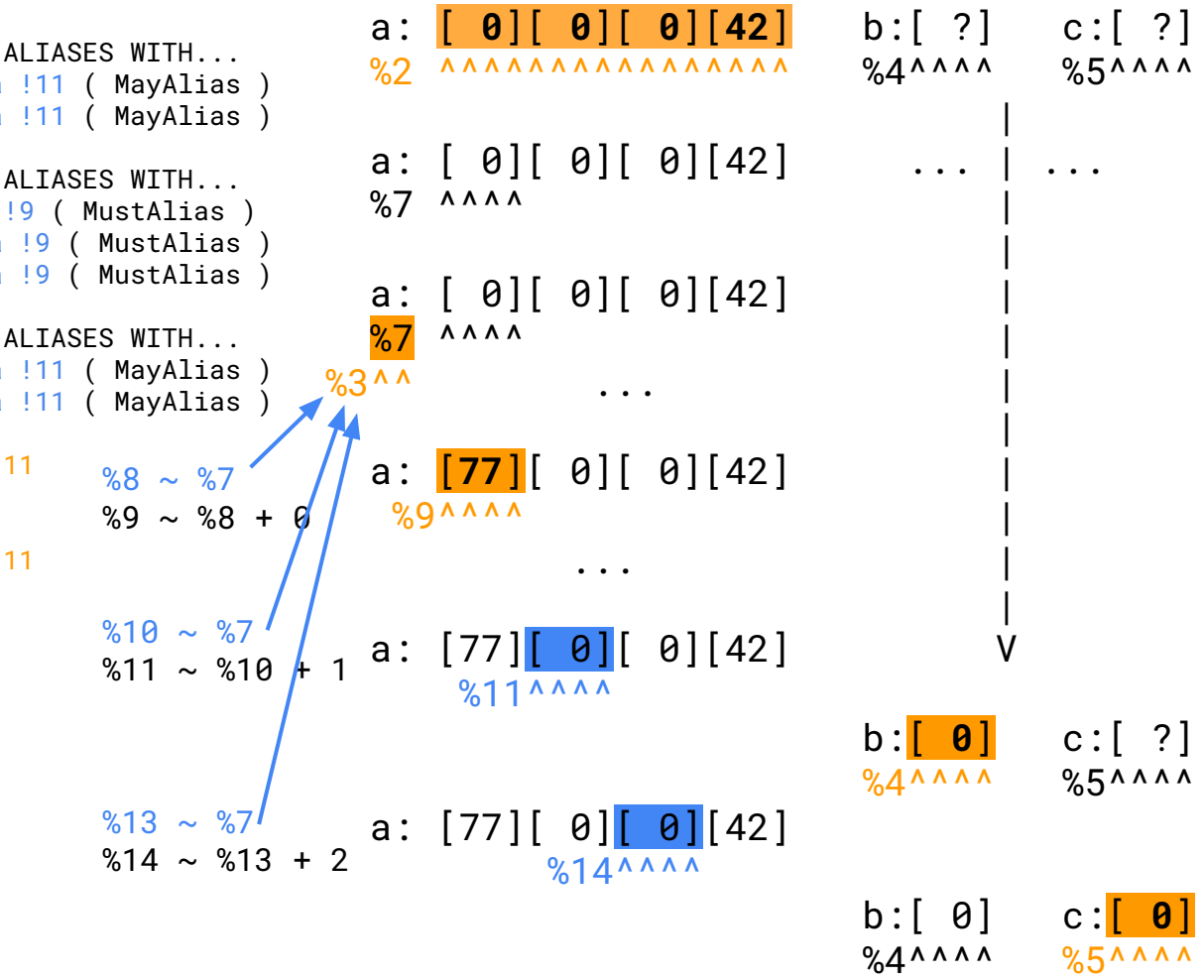
```
store i32 %0, ptr %2, align 4, !tbaa !5 ALIASES WITH...
  %12 = load i8, ptr %11, align 1, !tbaa !11 ( MayAlias )
  %15 = load i8, ptr %14, align 1, !tbaa !11 ( MayAlias )

store ptr %7, ptr %3, align 8, !tbaa !9 ALIASES WITH...
  %8 = load ptr, ptr %3, align 8, !tbaa !9 ( MustAlias )
  %10 = load ptr, ptr %3, align 8, !tbaa !9 ( MustAlias )
  %13 = load ptr, ptr %3, align 8, !tbaa !9 ( MustAlias )

store i8 77, ptr %9, align 1, !tbaa !11 ALIASES WITH...
  %12 = load i8, ptr %11, align 1, !tbaa !11 ( MayAlias )
  %15 = load i8, ptr %14, align 1, !tbaa !11 ( MayAlias )

  store i8 %12, ptr %4, align 1, !tbaa !11
      DOES NOT ALIAS WITH ANY LOADS

  store i8 %15, ptr %5, align 1, !tbaa !11
      DOES NOT ALIAS WITH ANY LOADS
```



Total Alias Queries: 25.00
MustAlias: 12.00%
May Alias: 16.00%
Partial Alias: 0.00%
NoAlias: 72.00%

Running print-alias-sets on NoAlias.c:

```
Alias sets for function 'foo':

Alias Set Tracker: 4 alias sets for 9 pointer values.

  AliasSet[0x55600d99d740, 4] may alias, Mod/Ref   Pointers: (ptr %2, LocationSize::precise(4)),
(ptr %9, LocationSize::precise(1)), (ptr %11, LocationSize::precise(1)), (ptr %14,
LocationSize::precise(1))

  AliasSet[0x55600d99d7e0, 3] must alias, Mod/Ref   Pointers: (ptr %6, LocationSize::precise(8)),
(ptr %3, LocationSize::precise(8)), (ptr %16, LocationSize::precise(8))

  AliasSet[0x55600d99dc50, 1] must alias, Mod/Ref   Pointers: (ptr %4, LocationSize::precise(1))

  AliasSet[0x55600d99dd40, 1] must alias, Mod/Ref   Pointers: (ptr %5, LocationSize::precise(1))
```