

Intervals Example 1

Sunday, January 14, 2024 4:49 PM

entry $\mapsto []$

```
let x:int = 0, y:int = input();
```

```
while x <= y {
  x = x+1;
}
```

```
return x;
```

worklist
~~entry~~
~~while_hdr~~
~~while_body~~
~~exit~~
 while_hdr

entry:

```
x = $copy 0
y = $call_ext input()
$jump while_hdr
```

$[0, 0]$

$\left[\begin{array}{l} x \mapsto [0, 0] \\ y \mapsto [-\infty, \infty] \end{array} \right]$

while_hdr

```
t = $cmp_lte x y
$branch t while_body exit
```

$\left[\begin{array}{l} x \mapsto [0, 2] \\ y \mapsto [-\infty, \infty] \\ t \mapsto [0, 1] \end{array} \right]$

$[1, 1]$

while_body:

```
x = $arith_add x 1
$jump while_hdr
```

$\left[\begin{array}{l} x \mapsto [1, 2] \\ \vdots \end{array} \right]$

exit:

```
$ret x
```

$[0, \infty] \nabla [1, \infty] = [0, \infty]$

$[0, 0] \nabla [1, 1] = [0, \infty]$

$[0, 0] \sqcup [1, 1] = [0, 1]$