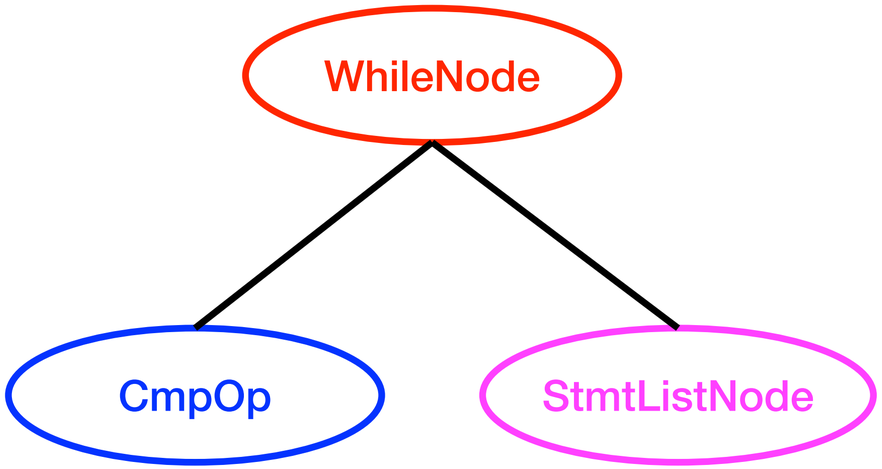
Generating Code for Loops

while loops

```
while (<cond_expr>) {
  <stmt_list>
}
```



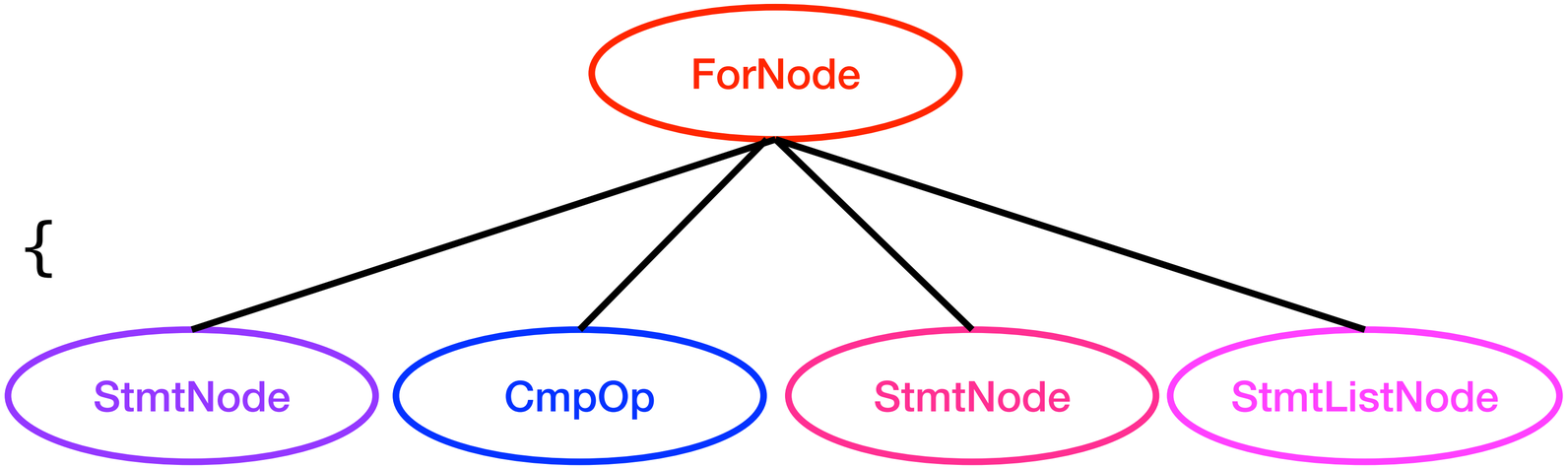
while loops

```
while (<cond_expr>) {
  <stmt_list>
}
```

```
l_loop:
<cond_expr>
b<!op> l_out
<stmt_list>
j l_loop
l_out:
```

for loops

```
for (<init_stmt>;
     <cond_expr>;
     <update_stmt>) {
  <stmt_list>
}
```



for loops

```
for (<init_stmt>;
     <cond_expr>;
     <update_stmt>) {
  <stmt_list>
}
```

```
<init_stmt>
l_loop:
<cond_expr>
b<!op> l_out
<stmt_list>
l_incr:
<update_stmt>
j l_loop
l_out:
```

continue and break statements

- Continue statements: skip past rest of block, perform incr_stmt and restart loop
- Break statements: jump out of loop (do not execute incr_stmt)
- Caveats:
  - Code for stmt_list is generated earlier–where do we jump?
  - Keep track of "loop depth" as you descend through AST

```
<init_stmt>
l_loop:
<cond_expr>
b<!op> l_out
<stmt_list>
l_incr:
<update_stmt>
j l_loop
l_out:
```