

ASTs for Control Structures

AST design

- Syntactically, control structures are **statements** just like assignment statements

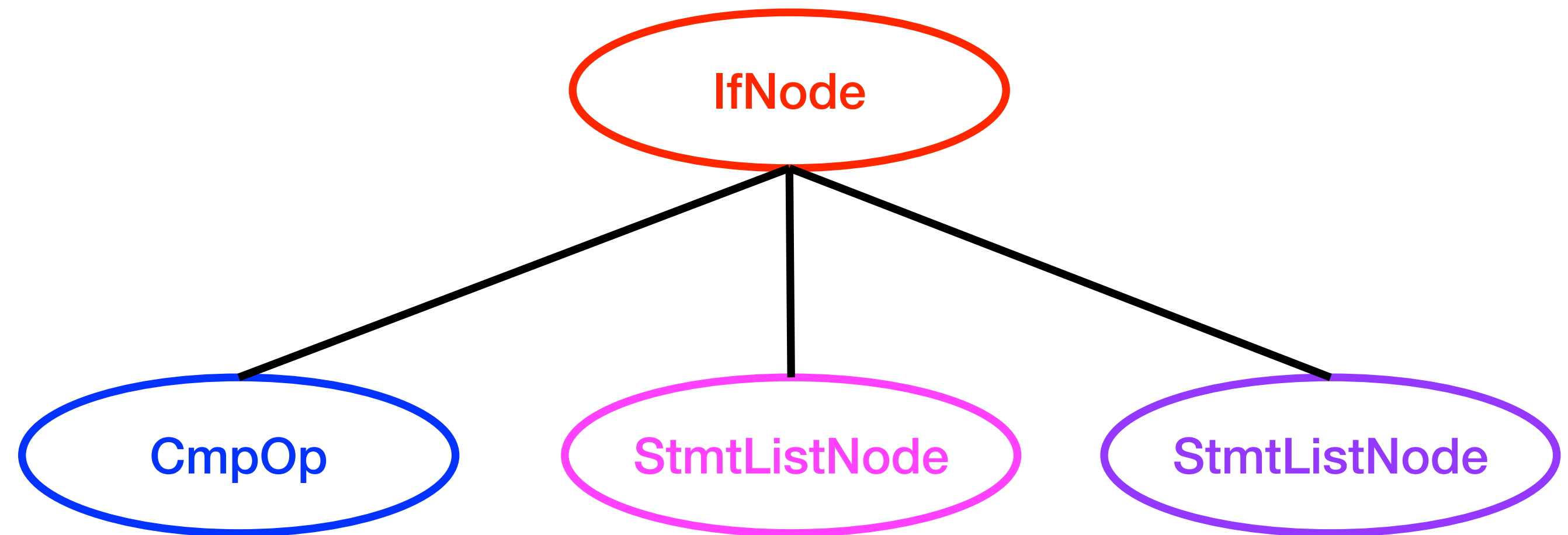
```
statement : base_stmt ';'
          | if_stmt
          | while_stmt ;
```

```
base_stmt : assign_stmt
          | read_stmt
          | print_stmt
          | return_stmt ;
```

- AST Nodes subclass from a StatementNode abstract class
 - IfStatement
 - WhileStatement
- Key difference: if statements and while loops can have *more statements nested inside*

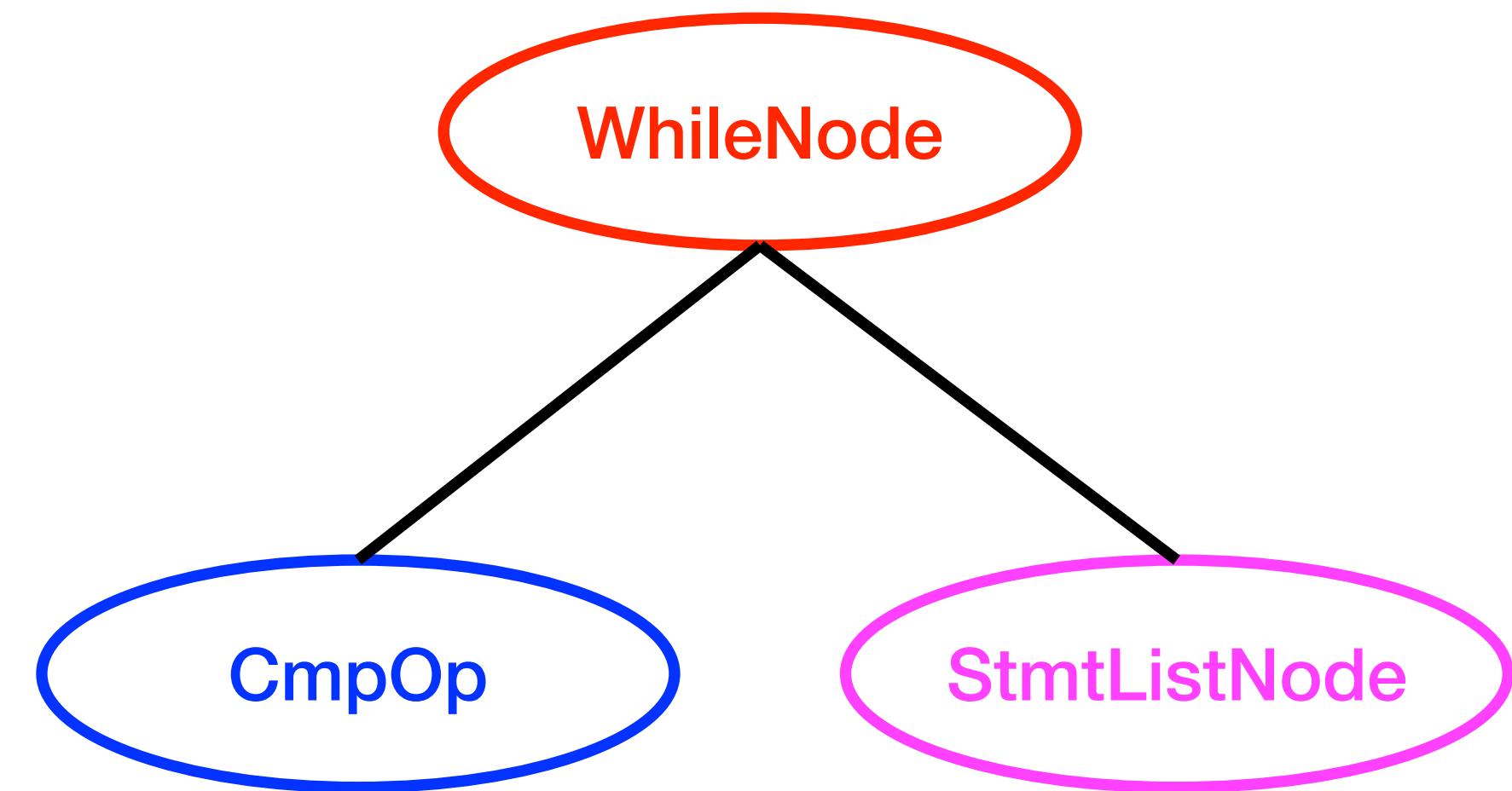
if statements

```
if (<cond_expr>) {  
    <stmt_list_1>  
} else {  
    <stmt_list_2>  
}
```



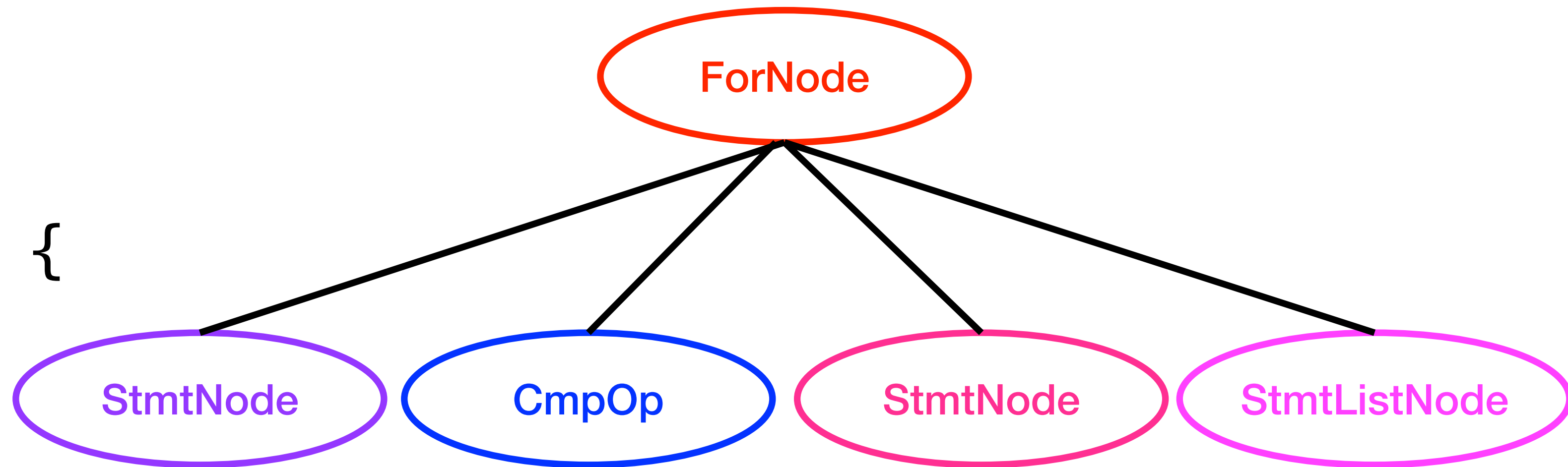
while loops

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



for loops

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



**next: generating code for control
structures**