

# Semantic Analysis

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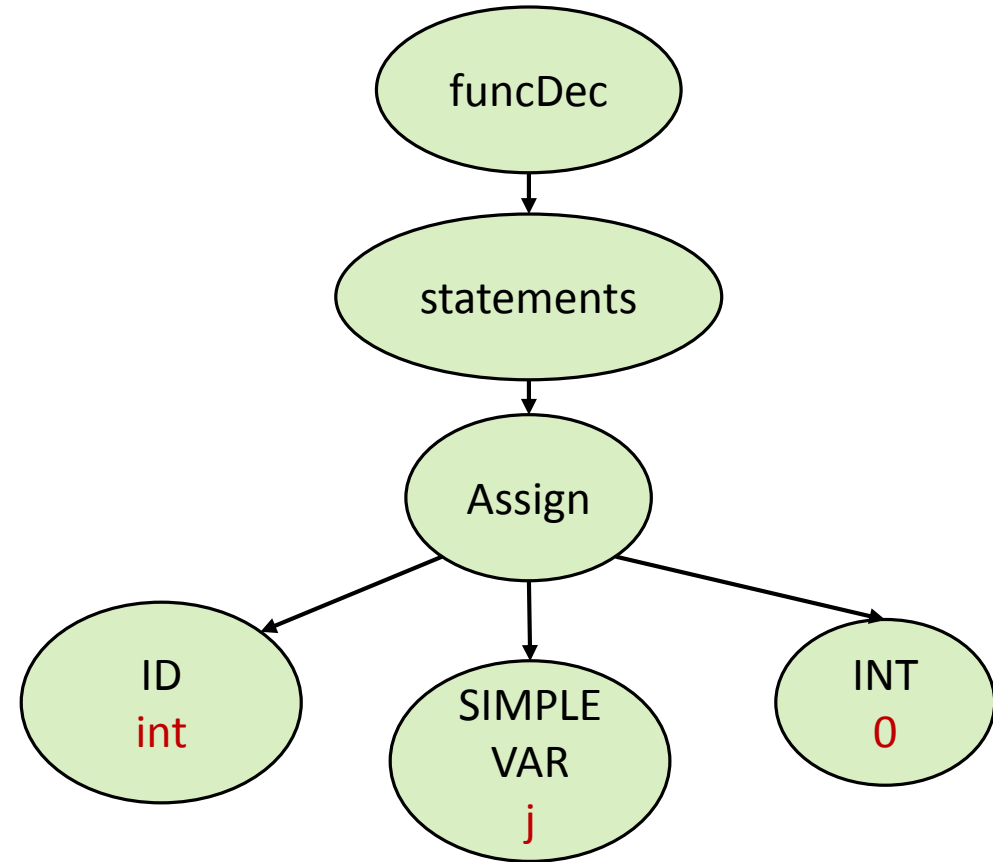
# Examples

First, let's try to detect semantic errors...

# Assignments

```
void main(void) {  
    int j = 0;  
}
```

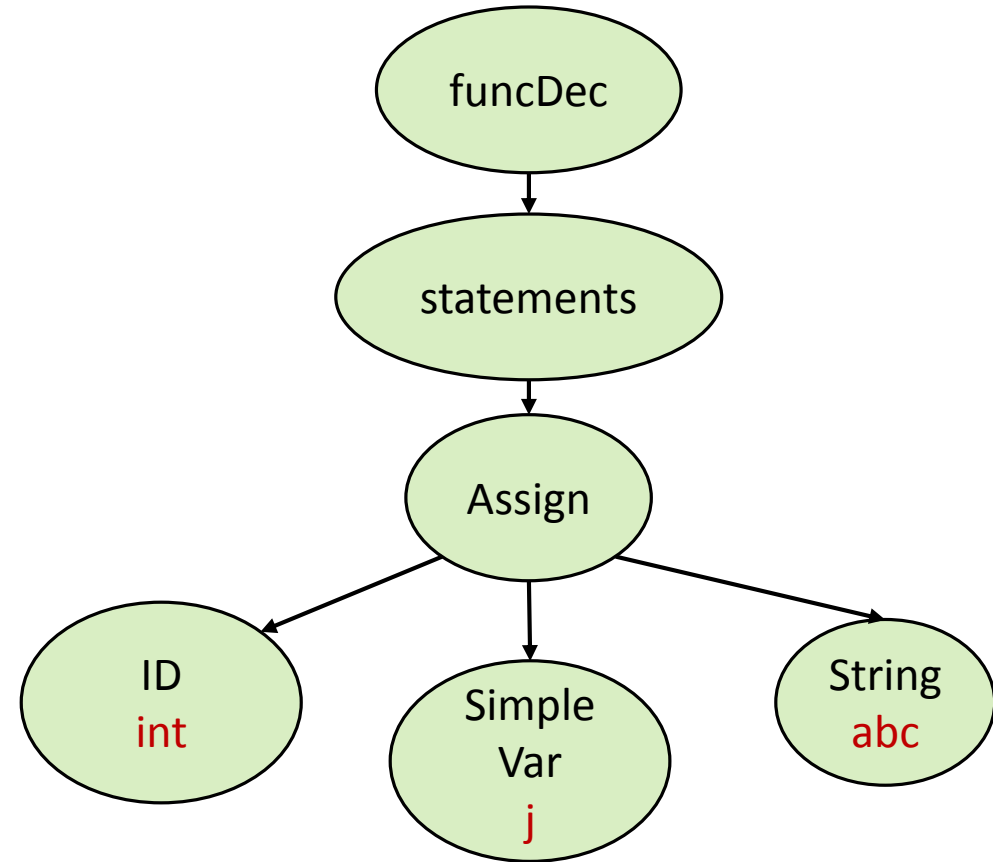
Valid



# Assignments

```
void main(void) {  
    int j = "abc";  
}
```

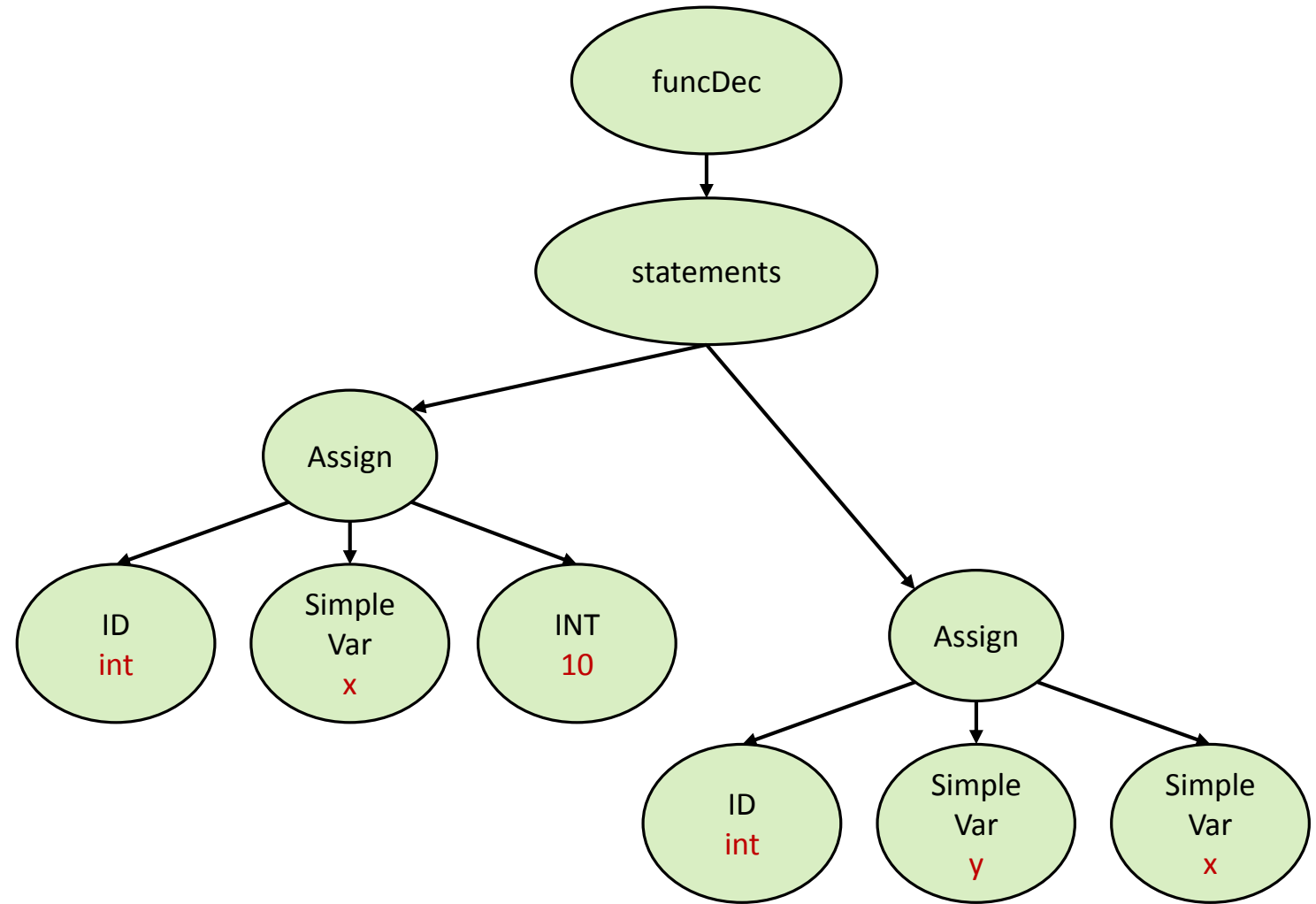
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# Assignments

```
void main(void) {  
    int x = 10;  
    int y = x;  
}
```

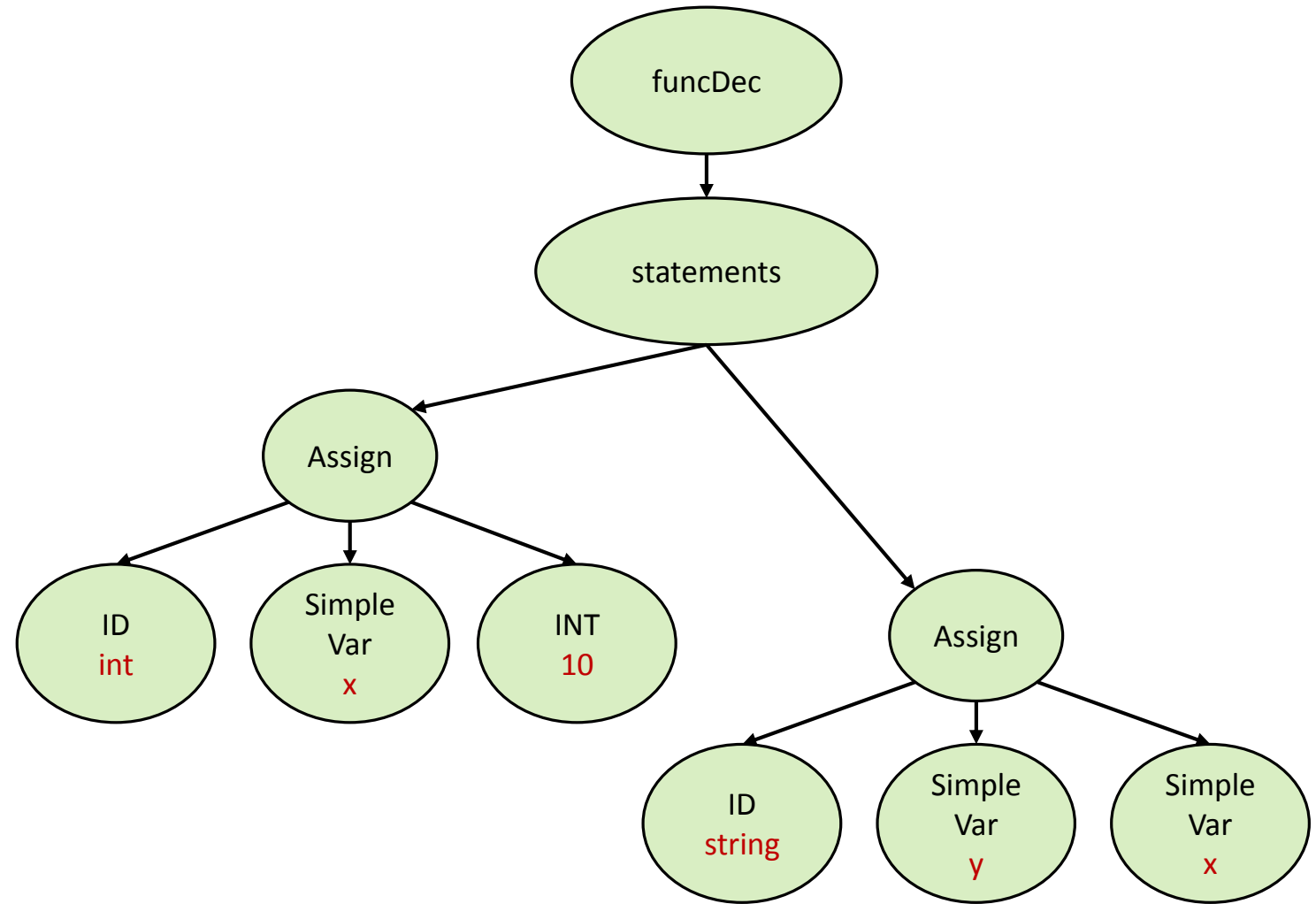
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# Assignments

```
void main(void) {  
  int x = 10;  
  string y = x;  
}
```

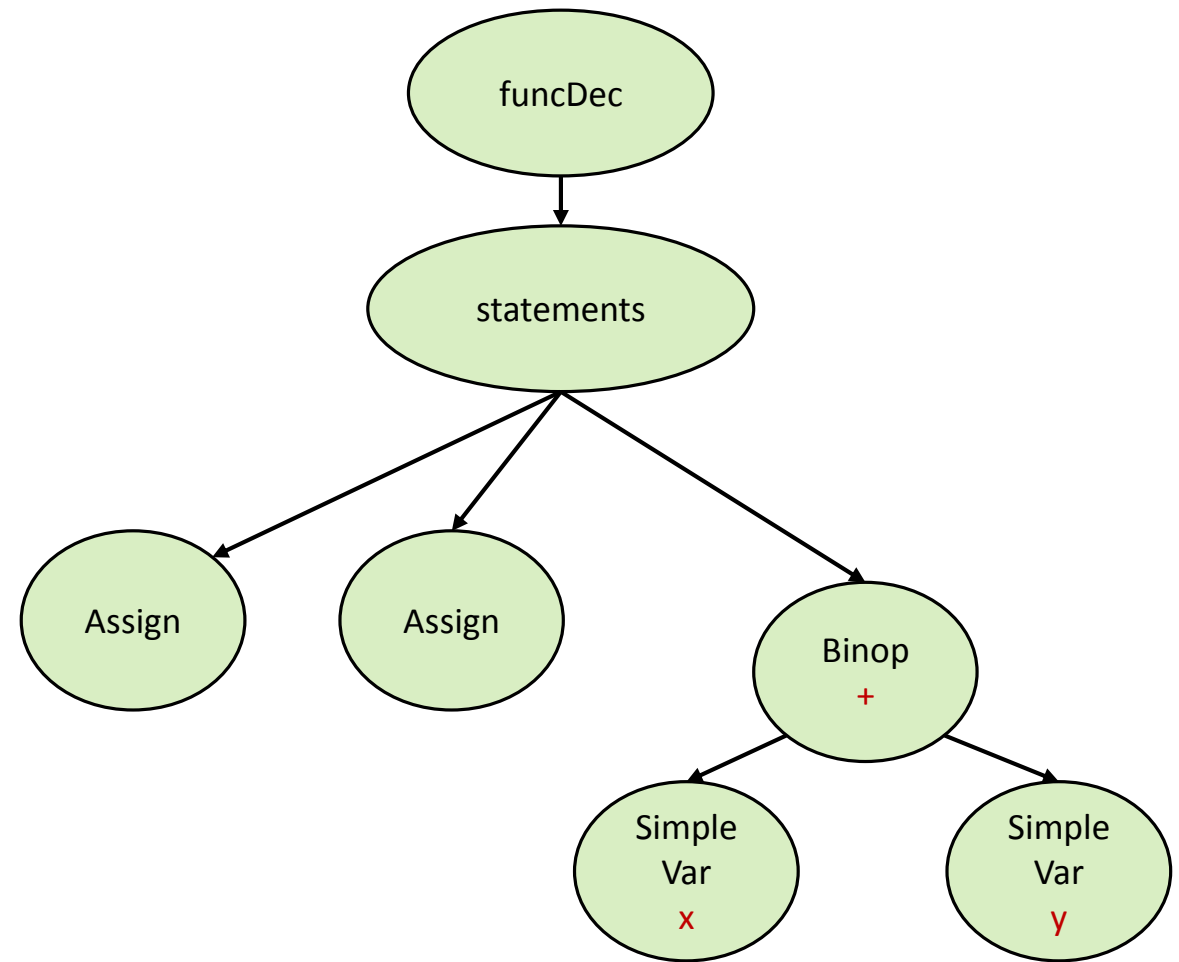
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# Binary Operations

```
void main(void) {  
    int x = 1;  
    int y = 2;  
    int z = x + y;  
}
```

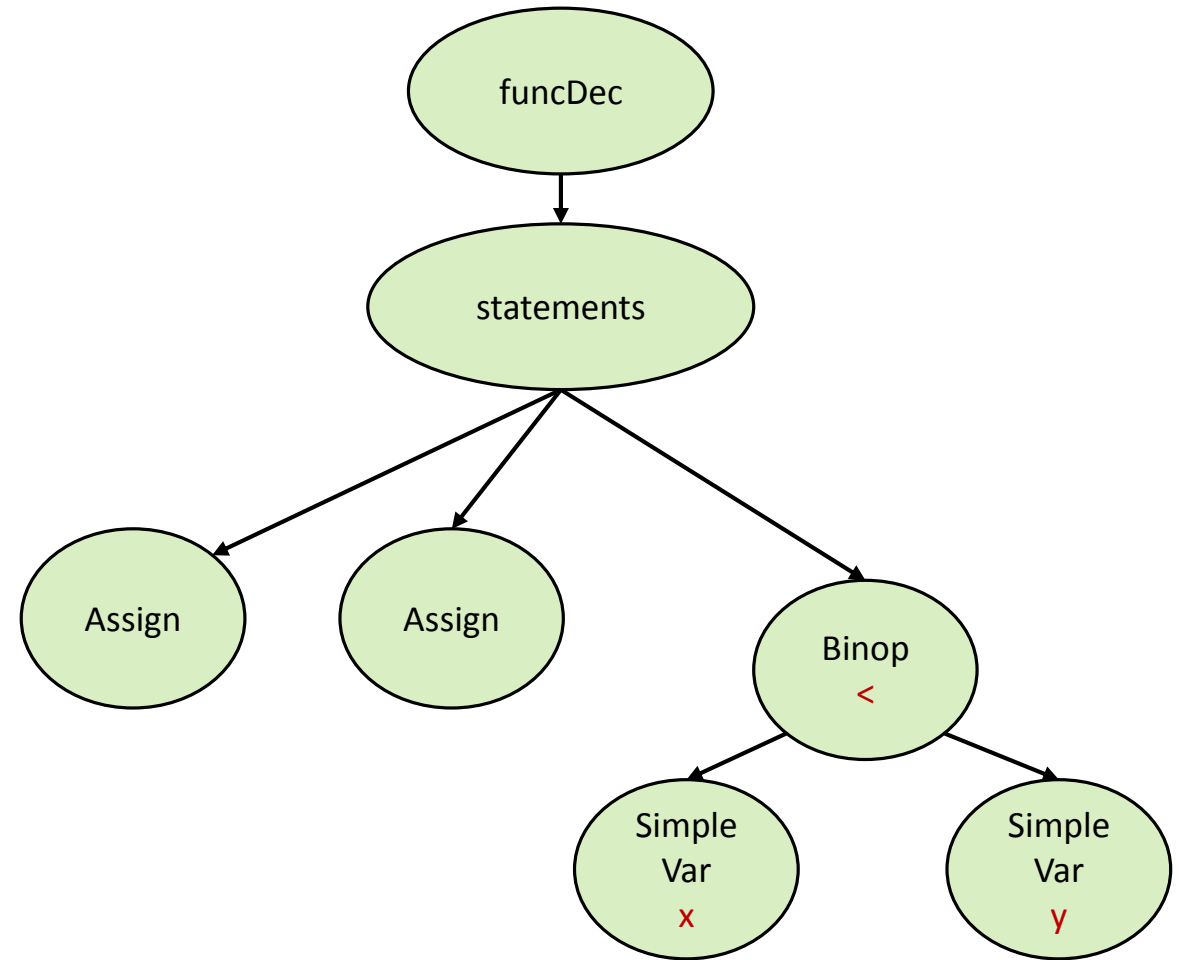
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# Binary Operations

```
void main(void) {  
  int x = 1;  
  string y = "A";  
  int z = x < y;  
}
```

Invalid

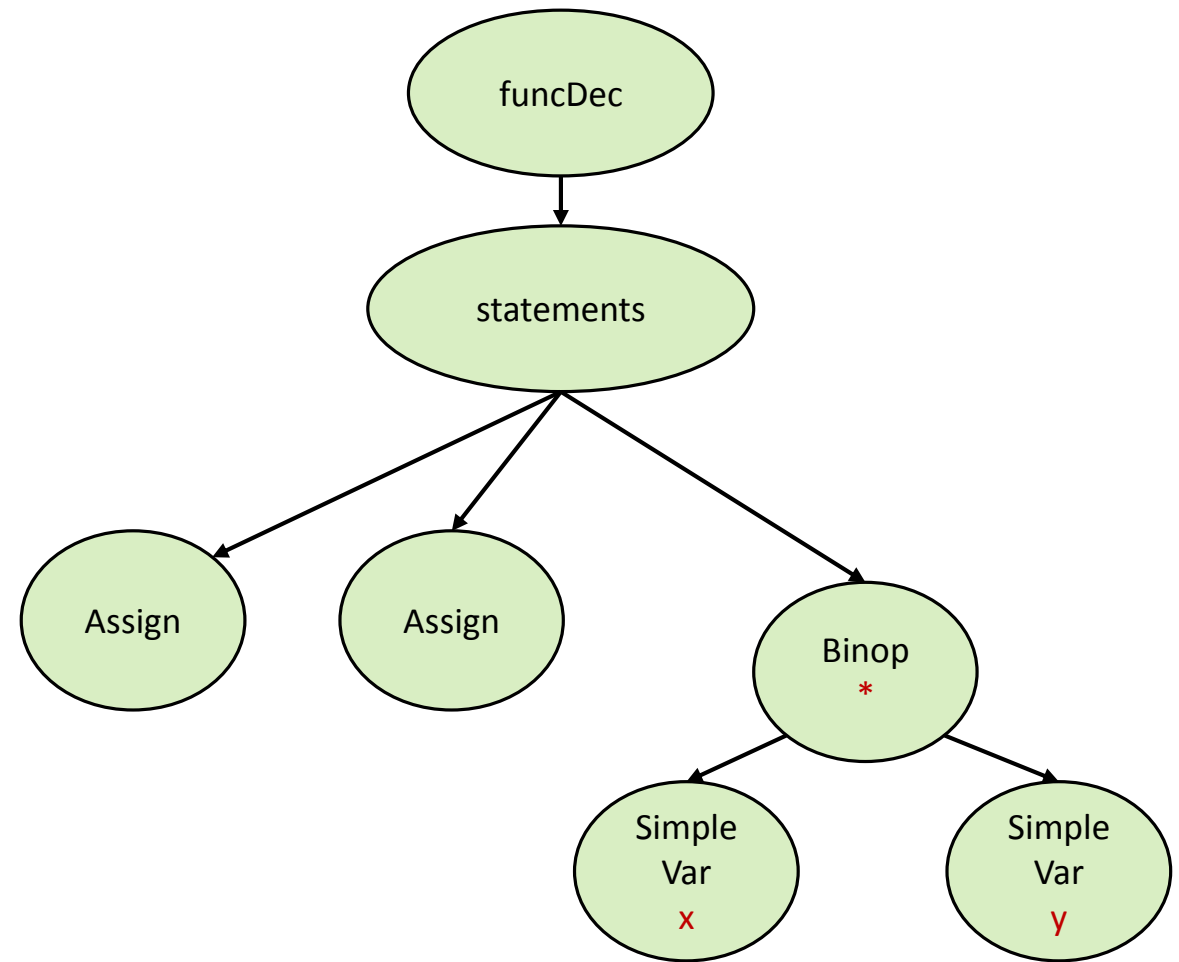




# Binary Operations

```
void main(void) {  
    string x = "A";  
    string y = "B";  
    string z = x * y;  
}
```

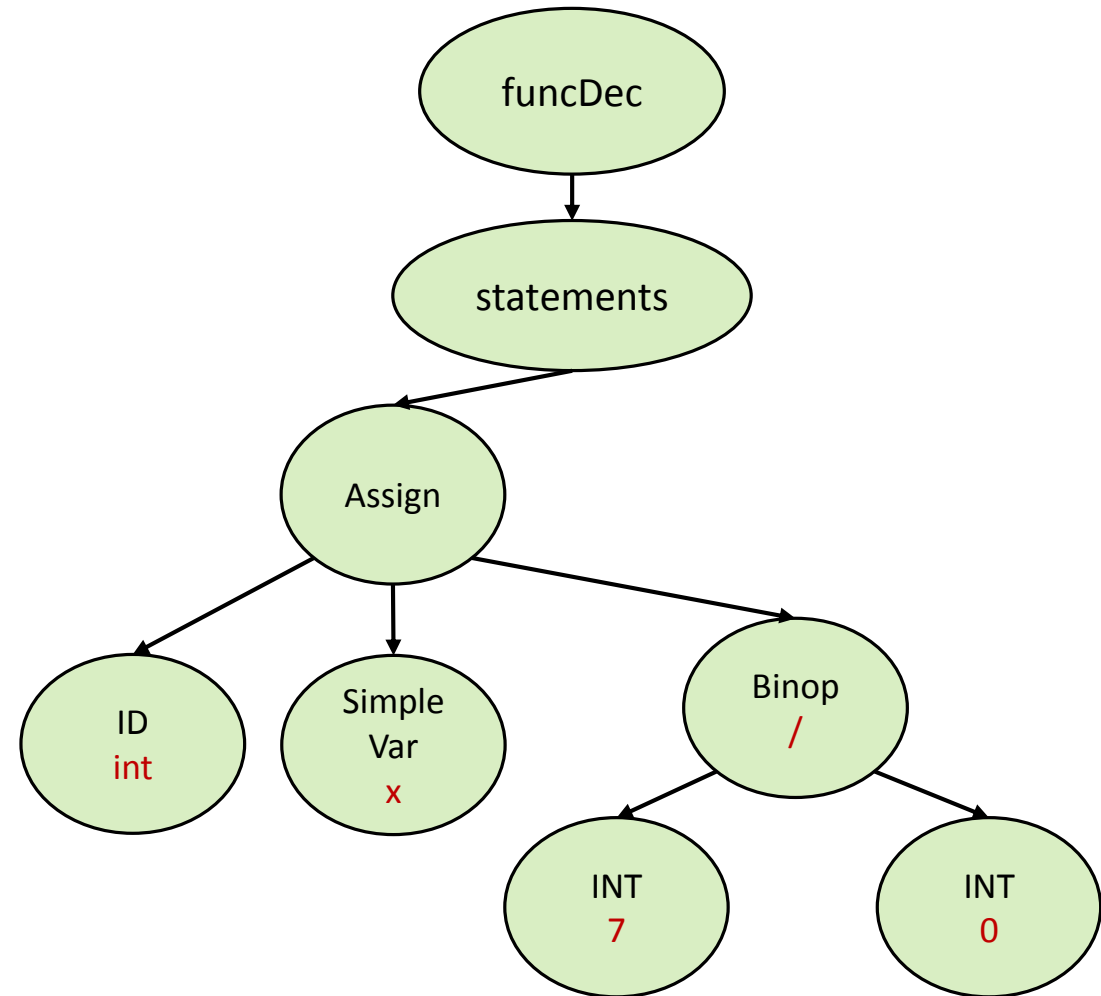
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# Binary Operations

```
void main(void) {  
    int x = 7 / 0;  
}
```

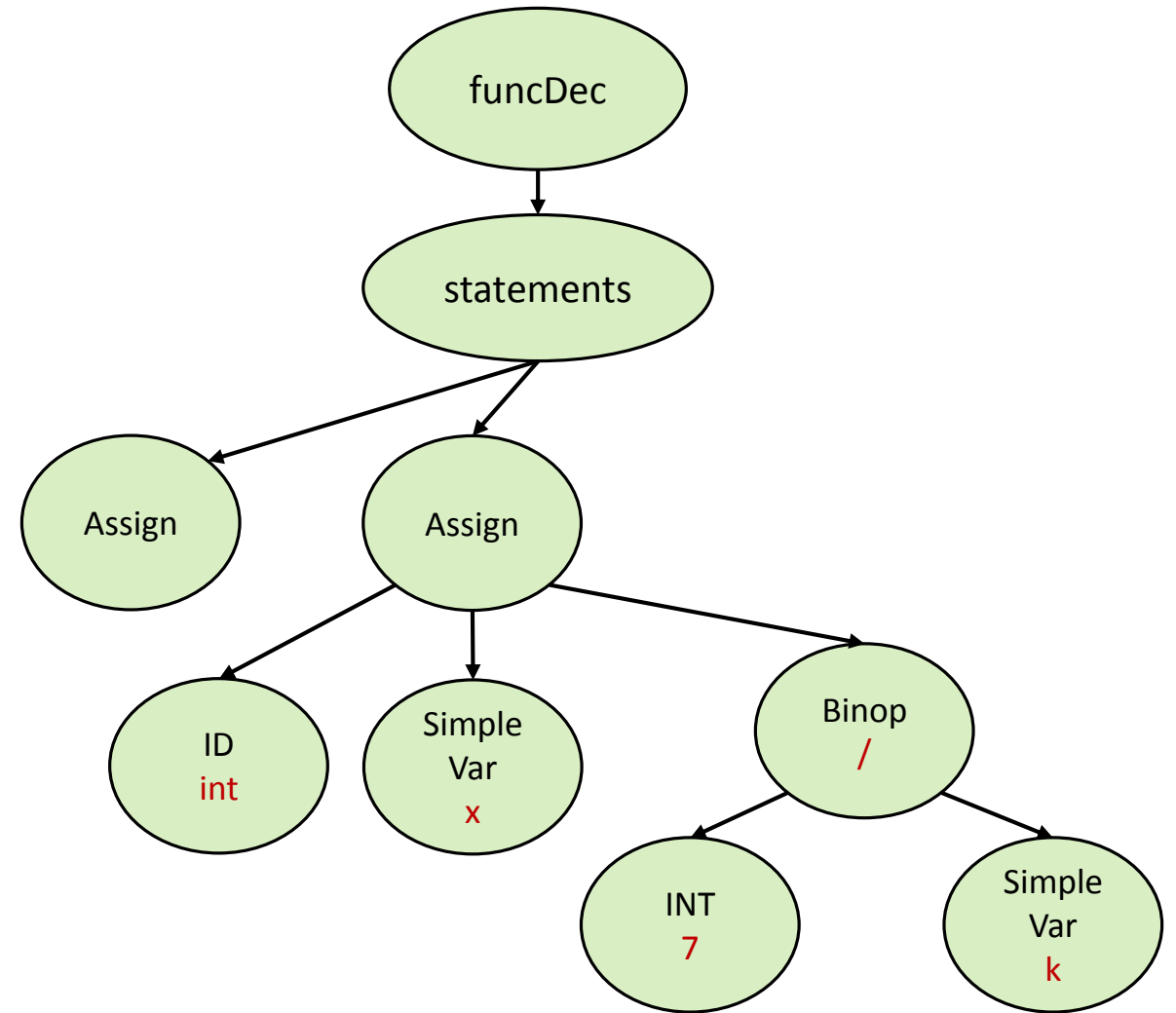
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# Binary Operations

```
void main(void) {  
    int k = 0;  
    int x = 7 / k;  
}
```

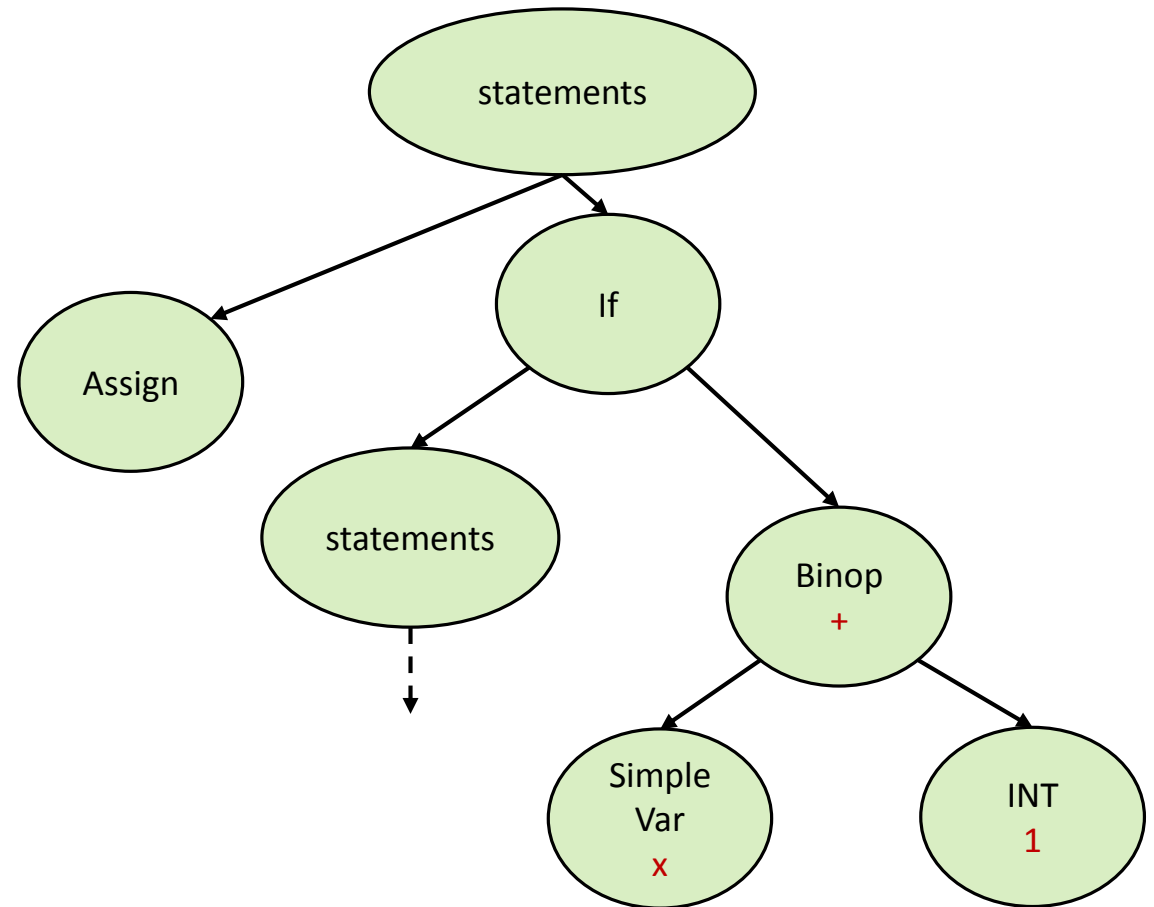
Depends



# If, While, ...

```
void main(void) {  
    int x = 1;  
    if (x + 1) {  
        int z = 2;  
    }  
}
```

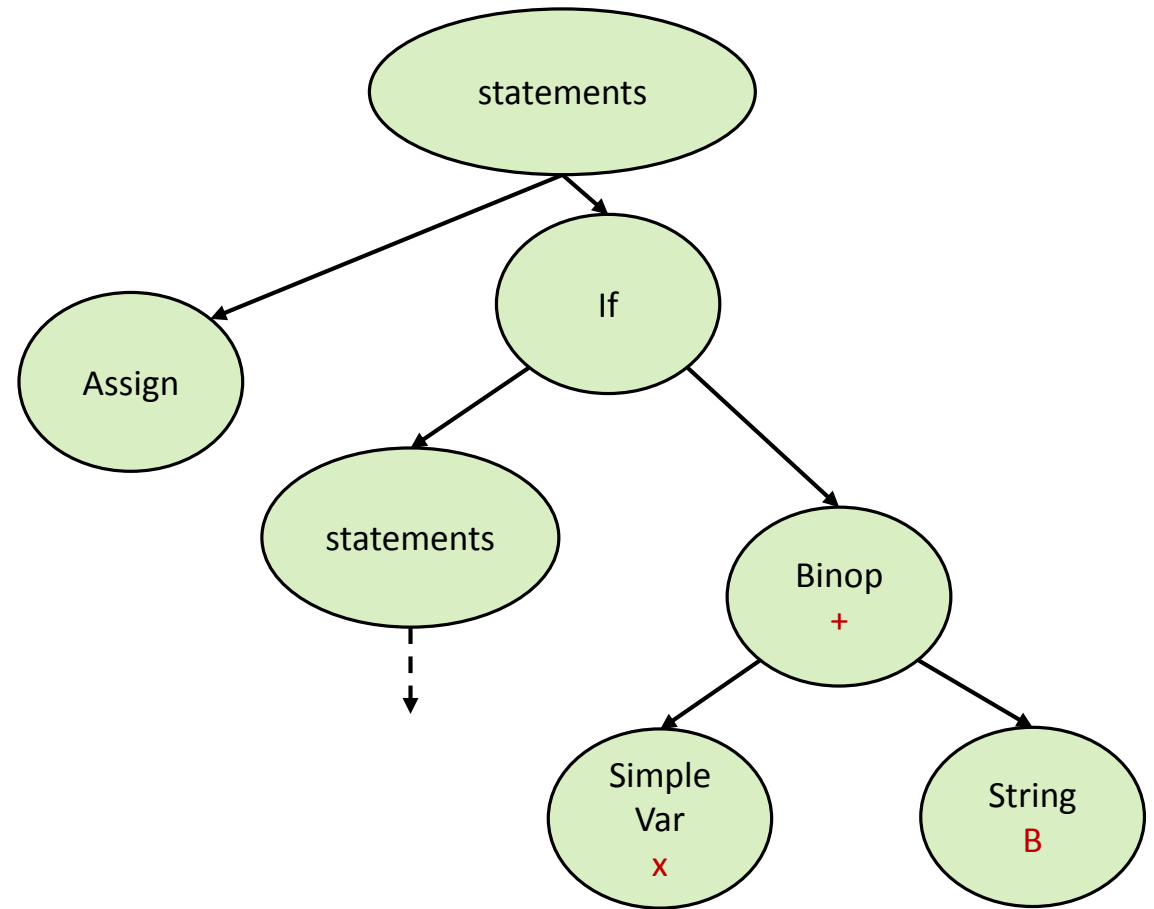
Valid



# If, While, ...

```
void main(void) {  
    string x = "A";  
    while (x + "B") {  
        int z = 2;  
    }  
}
```

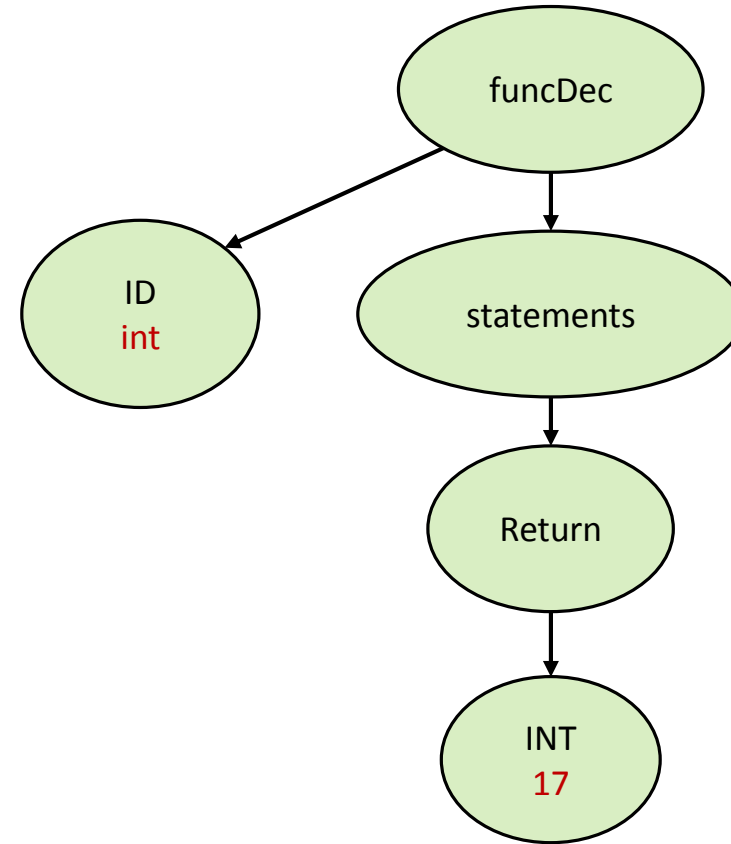
## Invalid



# Return Statement

```
int main(void) {  
    return 17;  
}
```

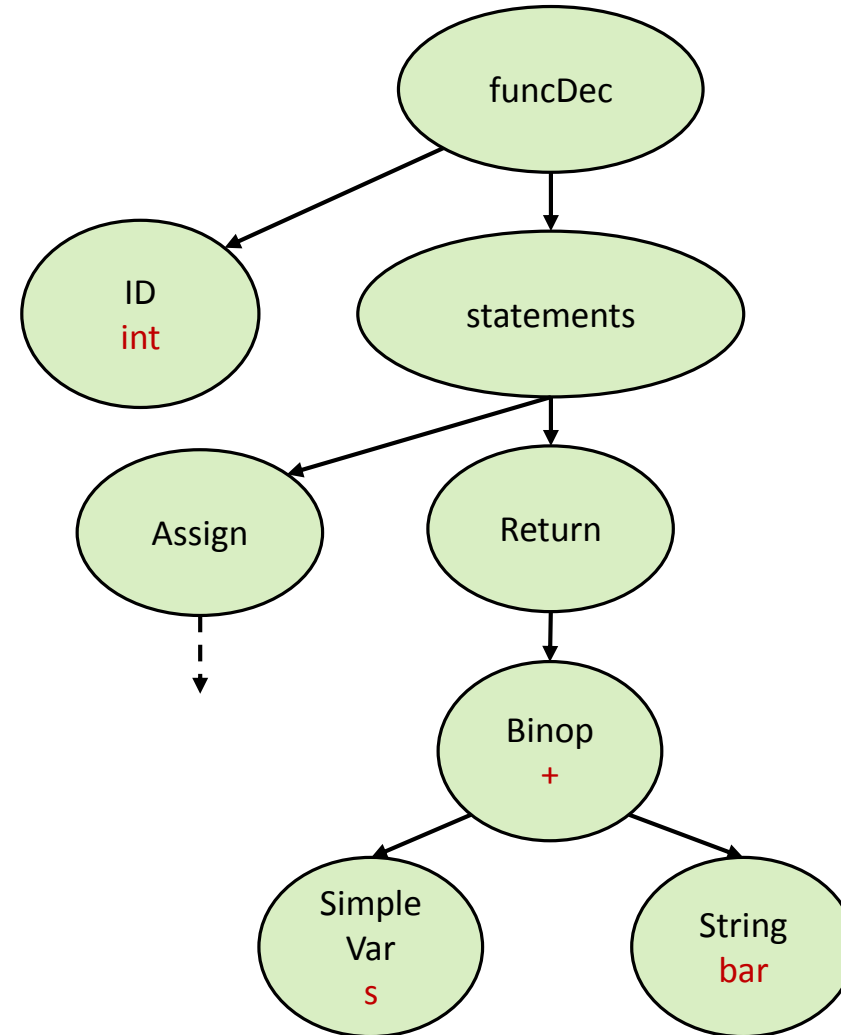
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# Return Statement

```
int main(void) {  
    string s = "foo"  
    return x + "bar";  
}
```

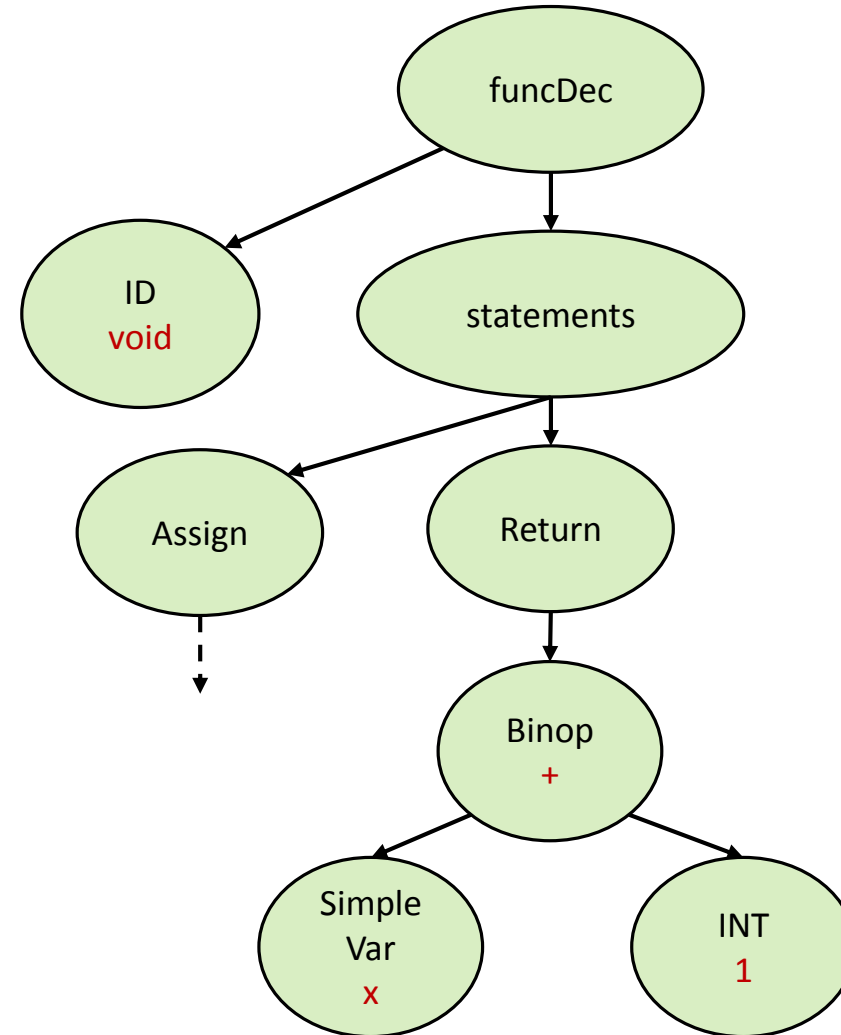
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# Return Statement

```
void main(void) {  
    int x = 1;  
    return x + 1;  
}
```

Invalid

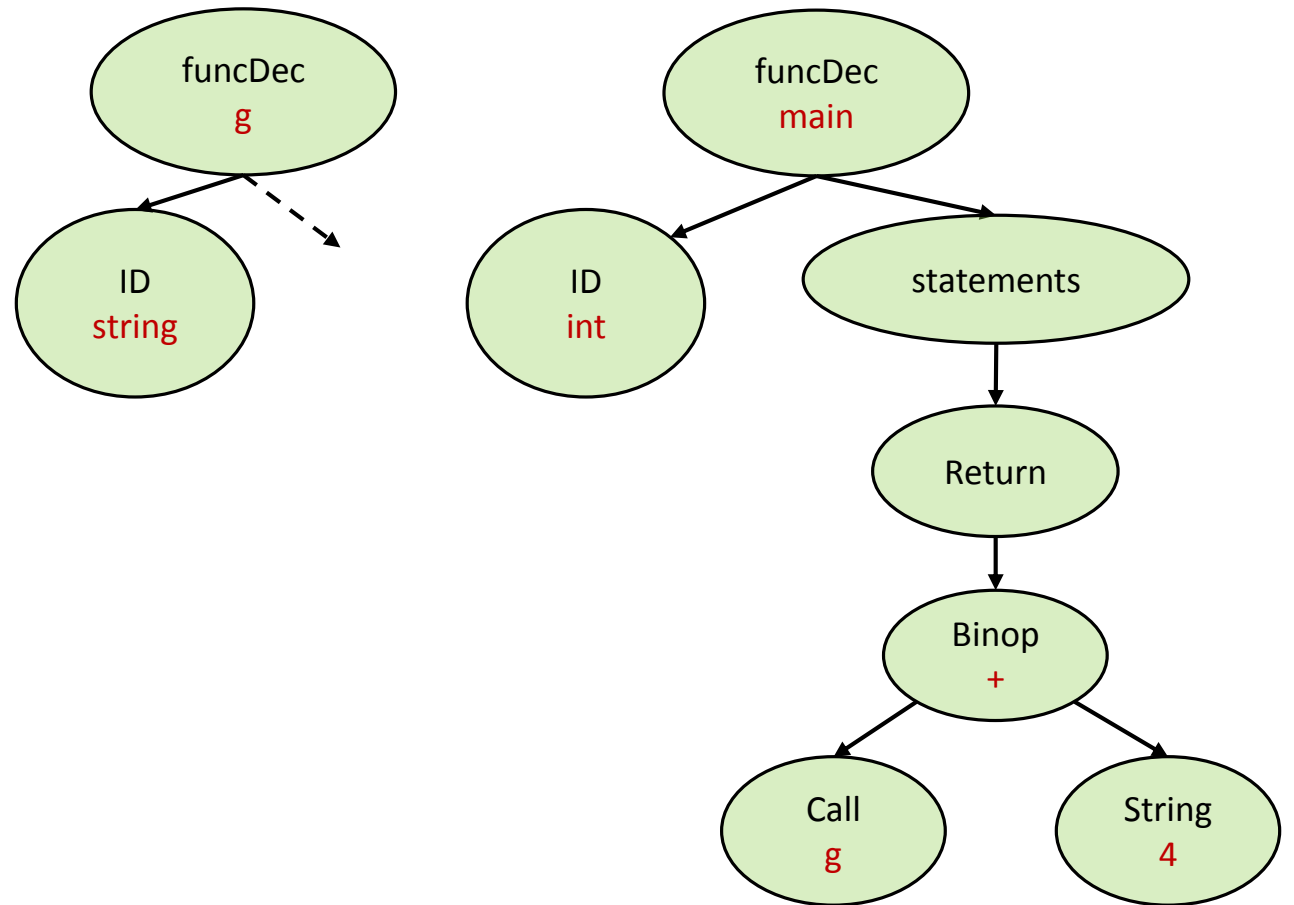




# Return Statement

```
string g() {  
    return "123";  
}  
int main(void) {  
    return g() + "4";  
}
```

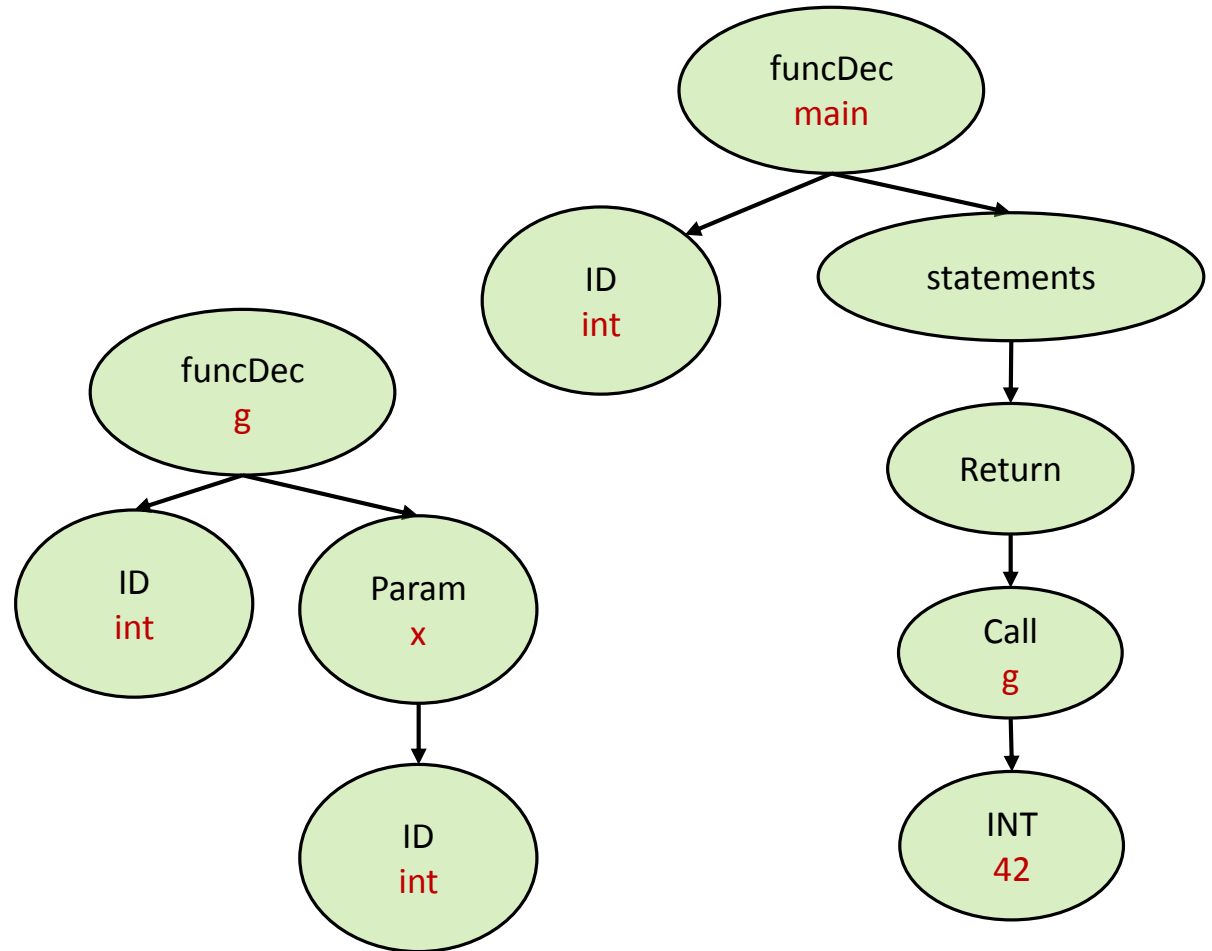
Invalid



# Function Calls

```
int g(int x) {  
    return x + 1;  
}  
int main(void) {  
    return g(42);  
}
```

Valid



# Function Calls

```
int g(int x) {  
    return x + 1;  
}  
int main(void) {  
    string z = "..."  
    return g(z);  
}
```

Invalid

