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Code Complexity

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Item 18: Code Complexity – Part 1*

- How many **execution paths** could there be in the following code?
  - An execution path must be made up of a **unique sequence** of function calls performed and exited in the same way
  - Called functions are considered **atomic**

* Sutter H., Exceptional C++: 47 Engineering Puzzles, Programming Problems, and Solutions, pp. 60-63

How many execution paths could there be in the following code?

```
String EvaluateSalaryAndReturnName( Employee e )
{
    if ( e.Title() == "CEO" || e.Salary() > 100000 )
    {
        cout << e.First() << " " << e.Last() << " is overpaid." << endl;
    }

    return e.First() + " " + e.Last();
}
```

Time to throw you a curve ball!

If you found:	Rate yourself:
3	Average
4 – 14	Exception-aware
15 – 23	Guru material

- The 23 are made up of:
  - 3 nonexceptional code paths
  - 20 invisible exceptional code paths

- Exceptions thrown by destructors are ignored
  - Never ever allow your destructors to throw!
  - BTW: Never ever call virtual functions during construction or destruction!

Nonexceptional Code Paths

```
if ( e.Title() == "CEO" || e.Salery() > 100000 ) { … }
```

true

```
if ( e.Title() == "CEO" || e.Salery() > 100000 ) { … }
```

false true

```
if ( e.Title() == "CEO" || e.Salery() > 100000 ) { … }
```

false false

Exceptional Code Paths

```
String EvaluateSalaryAndReturnName( Employee e )
   *                                    4
```

```
if ( e.Title() == "CEO" || e.Salery() > 100000 )
        5     7    6   11      8      10    9
```

```
cout << e.First() << " " << e.Last() << " is overpaid." << endl;
     12     17     13     14     18     15                16
```


```
return e.First() + " " + e.Last();
          19     22  21  23    20
```

Take Home Message

- Always be exception-aware.
  Know what code might emit exceptions.

Thank you for your attention! :)