

# SCOPE

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An Introduction to Computer Science



# Scope

- "Lifetime"
- "Visibility"
- "Availability"



# Global Scope

grade  
is now  
available

```
print("Starting program")  
grade = 64  
grade = grade + 5  
print("Grade:", grade)
```



# Local Scope

```
def calculate_grade(grade:int, weight:float)->float:  
    curved = 100 * grade ** .5  
    final = curved * weight  
    return final
```

```
calculate_grade(90, .1)
```

After this function ends,  
the local variables  
grade, weight,  
curved, and final are  
no longer available



# Returning Values

```
def calculate_grade(grade:int, weight:float)->float:  
    curved = 100 * grade ** .5  
    final = curved * weight  
    return final
```

Local variable  
named final

```
final = calculate_grade(90, .1)
```

Global variable  
named final

Unrelated,  
coincidentally named!



# Global Variables Are Bad

```
grade = 95
def print_grade():
    print("Grade:", grade)
print_grade()
```

Global variable inside  
function's scope!!

Better idea: pass it in as  
a parameter here!



# Scope Rule of Thumb

- Variables INSIDE a local scope should not be used OUTSIDE that scope
- Variables OUTSIDE a local scope should not be used INSIDE that scope

