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The slides are meant as visual support for the lecture.  
They are neither a documentation nor a script.

Please do not print the slides.

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# FIRST PROGRAM

```
print("hello, world")
```

use functions

arguments / parameter

comments

```
# this is a comment  
print("hello, world")
```



```
# this is a comment  
print("hello, world") # another comment
```

```
'''  
a multi-line comment  
for longer descriptions  
'''  
print("hello, world")
```

bugs

syntax errors

runtime errors

user input

```
user_name = input("What's your name? ")
```

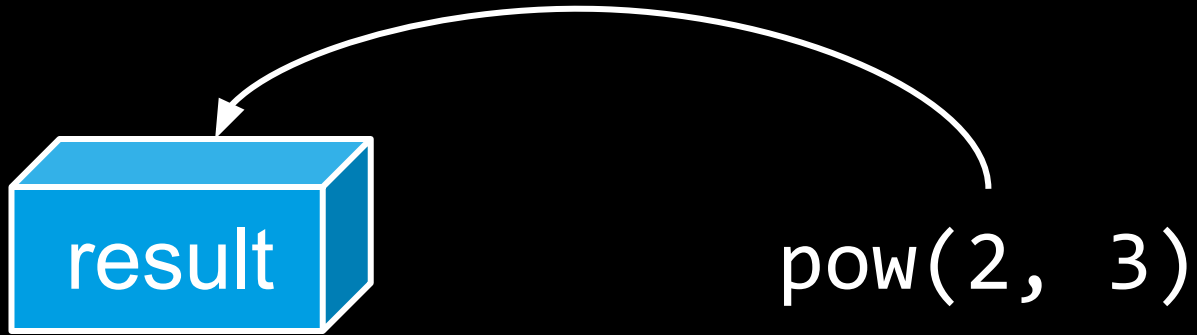
return values

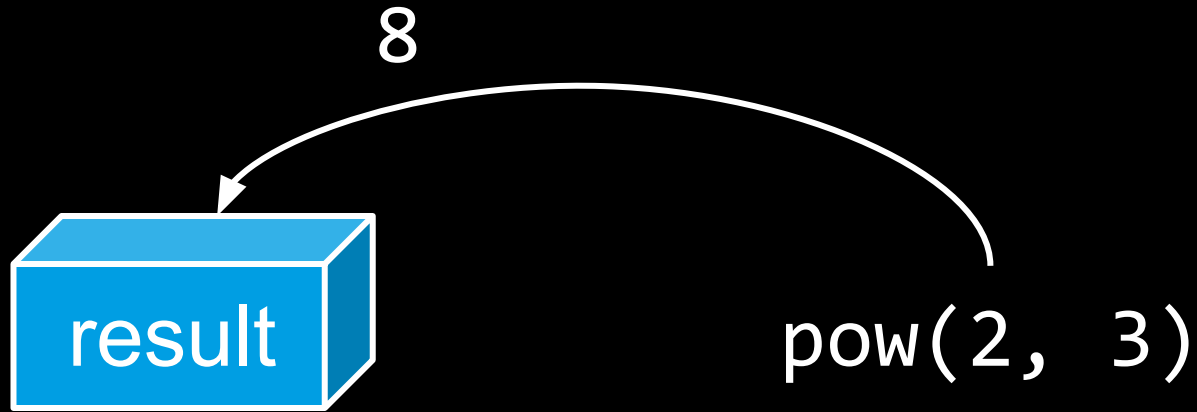


```
result = pow(2, 3)
```

# VARIABLES







```
exp = 4  
result = pow(2, exp)
```

 = 4

result = pow(2, )

```
exp = 4  
result = pow(2, exp)  
print(result)
```



pseudocode

# step 1: determine exponent

# step 2: calculate power

# step 3: print result

problem solving → divide and conquer

# step 1: determine exponent

# step 2: calculate power

# step 3: print result

```
# step 1: determine exponent
```

```
exp = 4
```

```
# step 2: calculate power
```

```
# step 3: print result
```

```
# step 1: determine exponent
```

```
exp = 4
```

```
# step 2: calculate power
```

```
result = pow(2, exp)
```

```
# step 3: print result
```

```
# step 1: determine exponent
```

```
exp = 4
```

```
# step 2: calculate power
```

```
result = pow(2, exp)
```

```
# step 3: print result
```

```
print(result)
```

# FUNCTIONS



create functions

```
def greet():  
    print("hello")
```

parameters

```
def greet(name):  
    print(f"hello {name}")
```

format strings

parameter default values

```
def greet(name="world"):  
    print(f"hello {name}")
```

return a result



```
def make_greeting(name):  
    greeting = f"hello {name}"  
    return greeting
```

# EXPRESSIONS

operators

math

$$5 + 5$$

$$9 - 8$$

$$2 / 1$$

$$6 * 7$$

$$5 // 2$$

$$10 \% 3$$

$$2^{**}3$$

logic

`2 == 1`

`2*2 > 1+3`

`2*2 >= 1+3`

`"A" < "B"`

`"A" < "B" and 2 == 1`

`"A" < "B" or 2 == 1`

data types



integer

float

boolean

string

```
strip()  
capitalize()  
title()
```

format strings

```
print(f"Hello {name}")
```

# CONDITIONALS



```
if <condition>:
```

```
...
```

```
if <condition>:
```

```
    ...
```

```
else:
```

```
    ...
```

```
if <condition>:  
    ...  
elif <condition>:  
    ...
```

# LOOPS

while loop

for loop