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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.

Comments and feedback at n.meseth@hs-osnabrueck.de

FIRST PROGRAM

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

use functions

built-in functions

```
print()
input()
...
```

functions from built-in modules

```
math.sqrt()
time.sleep()
sys.exit()
...
```

external modules

```
requests.get()
...
```

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

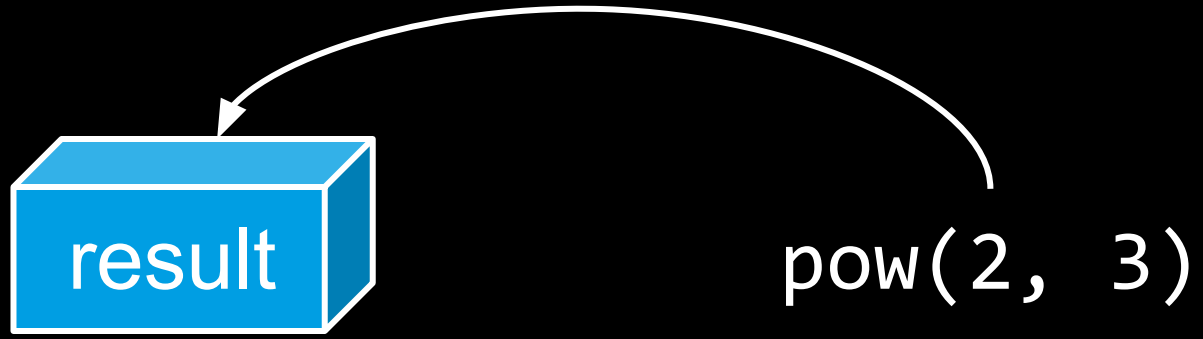
```
user_name = input("What’s your name? ")
```

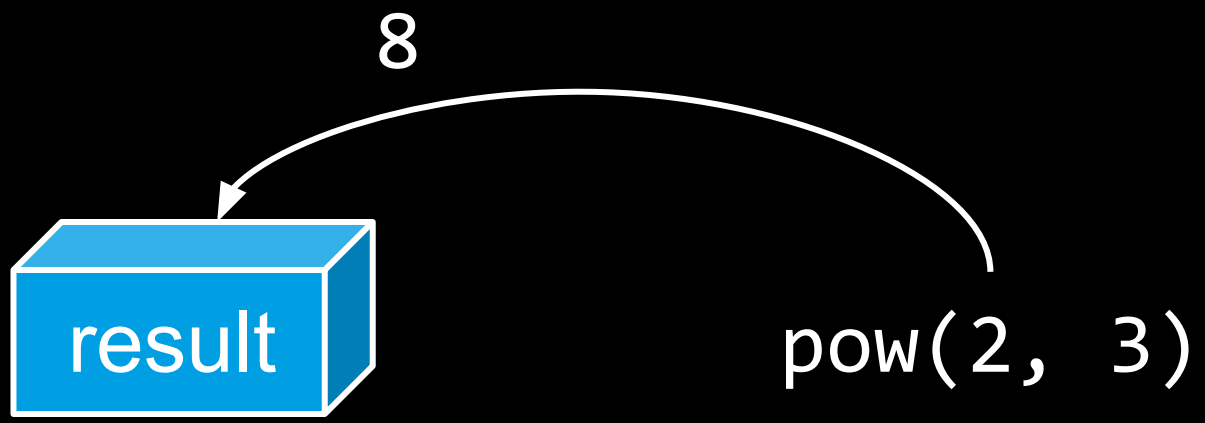
function’s return values

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

VARIABLES


result


result
pow(2, 3)


8
result
pow(2, 3)

```
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

BACK

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