SHARE YOUR CODE

LAST LESSON

STRING FORMATTING

```
>>> name = 'Guido'
>>> surname = 'van Rossum'
>>> age = 63
>>> print('Name:', name, ', surname:', surname, ', age:', age, '!
Name: Guido , surname: van Rossum , age: 63 !
```

```
>>> print('Name: ' + name + ', surname: ' + surname + ', age: ' +
Name: Guido, surname: van Rossum, age: 63!
```

```
>>> print(f'Name: {name}, surname: {surname}, age: {age}!')
Name: Guido, surname: van Rossum, age: 63!
```

F-STRINGS – WIDTH, ALIGNMENT AND FILL

https://realpython.com/python-f-strings/

```
>>>> f'{name:10}'
'Guido     '
```

```
>>>> f'{name:>10}'
'     Guido'
```

```
>>>> f'{name:^10}'
'  Guido   '
```

```
>>>> f'{name:.^10}'
'..Guido...'
```

```
>>> width = 10
>>>> f'{name:.^{width}}'
'..Guido...'
```

F-STRINGS – NUMBER FORMAT

```
>>> price = 123.4567890
>>> f'{price}'
'123.456789'
```

```
>>> f'{price:.2}'
'1.2e+02'
```

```
>>> f'{price:.2f}'
'123.46'
```

```
>>> f'{price:e}'
'1.234568e+02'
```

```
>>> f'{price:+.2f}'
'+123.46'
```

```
>>> negative_price = -price
>>> f'{price: .2f} vs. {negative_price: .2f}'
' 123.46 vs. -123.46'
```

F-STRINGS – EXPRESSIONS

```
>>> f'Surname length: {len(surname)}'
'Surname length: 10'
```

```
>>> f'lower full name: {name.lower()} {surname.lower()}'
'lower full name: guido van rossum'
```

Don't complicate f-strings

```
>>> import random
>>> f'Over threshold: {"yes" if random.random() > 0.3 else "no"}'
'Over threshold: yes'
```

```
>>> import random
>>> over_threshold = 'yes' if random.random() > 0.3 else 'no'
>>> f'Over threshold: {over_threshold}'
'Over threshold: no'
```

.format()

```
>>> 'Name: {}, surname: {}'.format(name, surname)
'Name: Guido, surname: van Rossum'
```

```
>>> 'Name: {name}, surname: {surname}'.format(name = name, surnam
'Name: Guido, surname: van Rossum'
```

```
>>> credentials = {'name': 'Guido', 'surname': 'van Rossum'}
>>> f'Name: {credentials["name"]}, surname: {credentials["surname
```

```
>>> 'Name: {name}, surname: {surname}'.format(**credentials)
'Name: Guido, surname: van Rossum'
```

FILES

FILE PATH

Windows

```
C:\Users\Bob\Documents\gifts.txt
```

Linux + Mac

```
/home/Bob/Documents/gifts.txt
```

ABSOLUTE VS. RELATIVE PATH

```
/home/Bob $ pwd
/home/Bob
/home/Bob $ cd Documents
/home/Bob/Documents $ cat gifts.txt # relative path
gifts file content
/home/Bob/Documents $ cat /home/Bob/Documents/gitfs.txt # absolut
gifts file content
/home/Bob/Documents $ cd .. # parent directory
/home/Bob $ cat Documents/gifts.txt # relative path
```

FILE OPEN, READ AND CLOSE

```
file = open('gifts.txt')
content = file.read()
print(content)
file.close()
```

Always use context manager

```
>>> with open('gifts.txt') as file:
...     content = file.read()
... print(content)
VR - 1000 USD
JetPack - 30000 USD
Book - 30 USD
```

OPEN NON-EXISTENT FILE

```
>>> with open('g.txt.') as file:
...     content = file.read()
...
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
FileNotFoundError: [Errno 2] No such file or directory: 'g.txt.'
```

FILE WRITE

```
with open('gifts.txt', mode='w') as file:
        file.write('Overwriting content of the file')
```

OPEN FOR WRITING TO NON-EXISTENG FILE

```
>>> with open('g.txt', 'w') as file:
...     file.write('Hello world')
...
11
```

FILE OPEN MODES

`'r'`
: open for reading text, default

`'w'`
: truncate and open for writing text

`'a'`
: open for writing text, append at the end

`'r+'`
: open for reading and writing text

`'w+'`
: truncate and open for reading and writing text

`'rb'`
: open for reading bytes

`'wb'`
: truncate and open for writing bytes

READING FILE LINE BY LINE

```
>>> with open('gifts.txt') as file:
...     for line in file:
...         print('#', line, end='')
...
# VR - 1000 USD
# JetPack - 30000 USD
# Book - 30 USD
```

TODAY'S LESSON

ERRORS

```
>>> selection = input('Choose an option from (1, 2, 3): ')
Choose an option from (1, 2, 3): 1
>>> index = selection - 1
```

```
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
TypeError: unsupported operand type(s) for -: 'str' and 'int'
```

Tutorial errors

TRY-EXCEPT

```
try:
    surveilled code
except:
    handled exception
```

```
selection = input('Choose an option from (1, 2, 3): ')
try:
    index = selection -1
except TypeError:
    print('You tried to count with wrong types!')
```

TRY-EXCEPT

```
selection = input('Choose an option from (1, 2, 3): ')
try:
        index = selection -1
except TypeError as exc:
        print('You tried to count with wrong types! Exception:',
```

```
You tried to count with wrong types! Exception: unsupported opera
```

TRY-EXCEPT MORE EXCEPTIONS

```
try:
    index = selection -1
except TypeError:
    print('You tried to count with wrong types!')
except NameError:
    print('Some variable must be missing'
```

TRY-EXCEPT MORE EXCEPTIONS 2

```
try:
    index = selection -1
except (TypeError, NameError):
    print('Something went wrong with the computation')
```

TRY-EXCEPT-ELSE

```
try:
    index = selection -1
except TypeError:
    print('You tried to count with wrong types!')
else:
    print('Everything went as expected')
```

TRY-EXCEPT-ELSE-FINALLY

```
try:
    index = selection -1
except TypeError:
    print('You tried to count with wrong types!')
else:
    print('Everything went as expected')
finally:
    print('This is performed no matter what')
```

```
try:
    index = selection -1
finally:
    print('This is performed no matter what')
```

TRY-EXCEPT SUMMARY

```
try except
try except except ...
try except else
try finally
try except else finally
```

EXCEPTIONS

Built-in Exceptions

```
BaseException
 +-- SystemExit
 +-- KeyboardInterrupt
 +-- GeneratorExit
 +-- Exception
      +-- StopIteration
      +-- StopAsyncIteration
      +-- ArithmeticError
      |    +-- FloatingPointError
      |    +-- OverflowError
      |    +-- ZeroDivisionError
      +-- AssertionError
      +-- AttributeError
      +-- BufferError
      +-- EOFError
      +-- ImportError
```

RAISING AN EXCEPTION

```
def get_domain_from_email(email):
    if '@' not in email:
        raise ValueError(f'Email \'{email}\' does not contain @.'
    ...
```

```
>>> get_domain_from_email('text')
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
  File "<stdin>", line 3, in get_domain_from_email
ValueError: Email 'text' does not contain @.
```

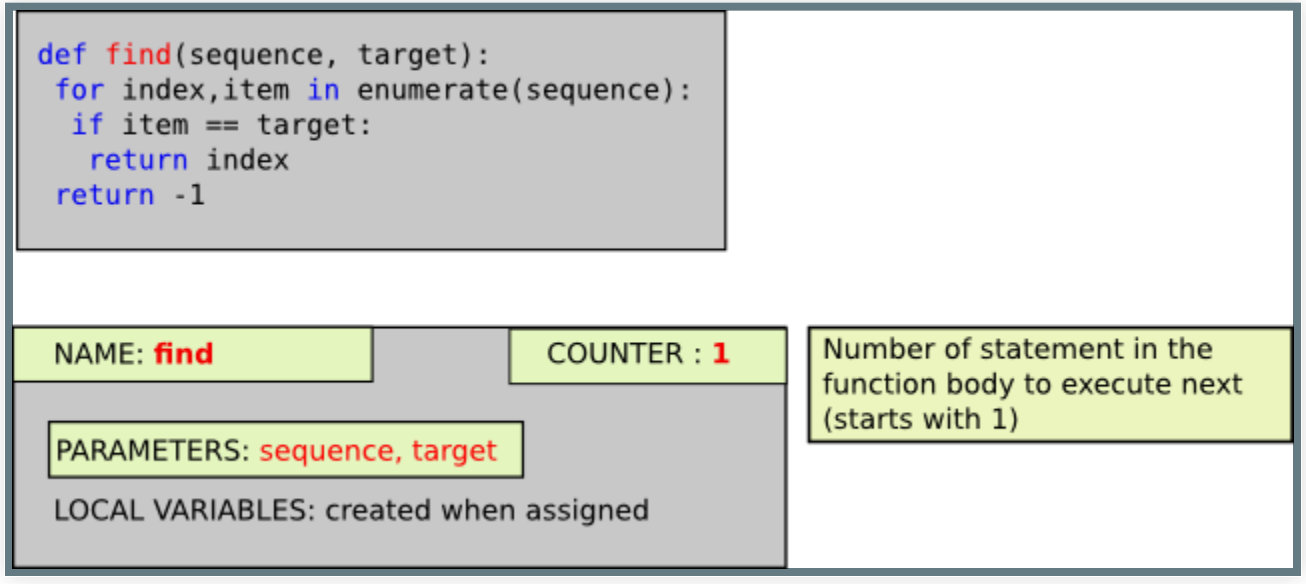
```
>>> try:
...     get_domain_from_email('text')
... except ValueError as exc:
...     print('Oops! Something went wrong. Exception:', exc)
...
Oops! Something went wrong. Exception: Email text does not contai
```

EASIER ASK FOR FORGIVENESS THAN PERMISSION

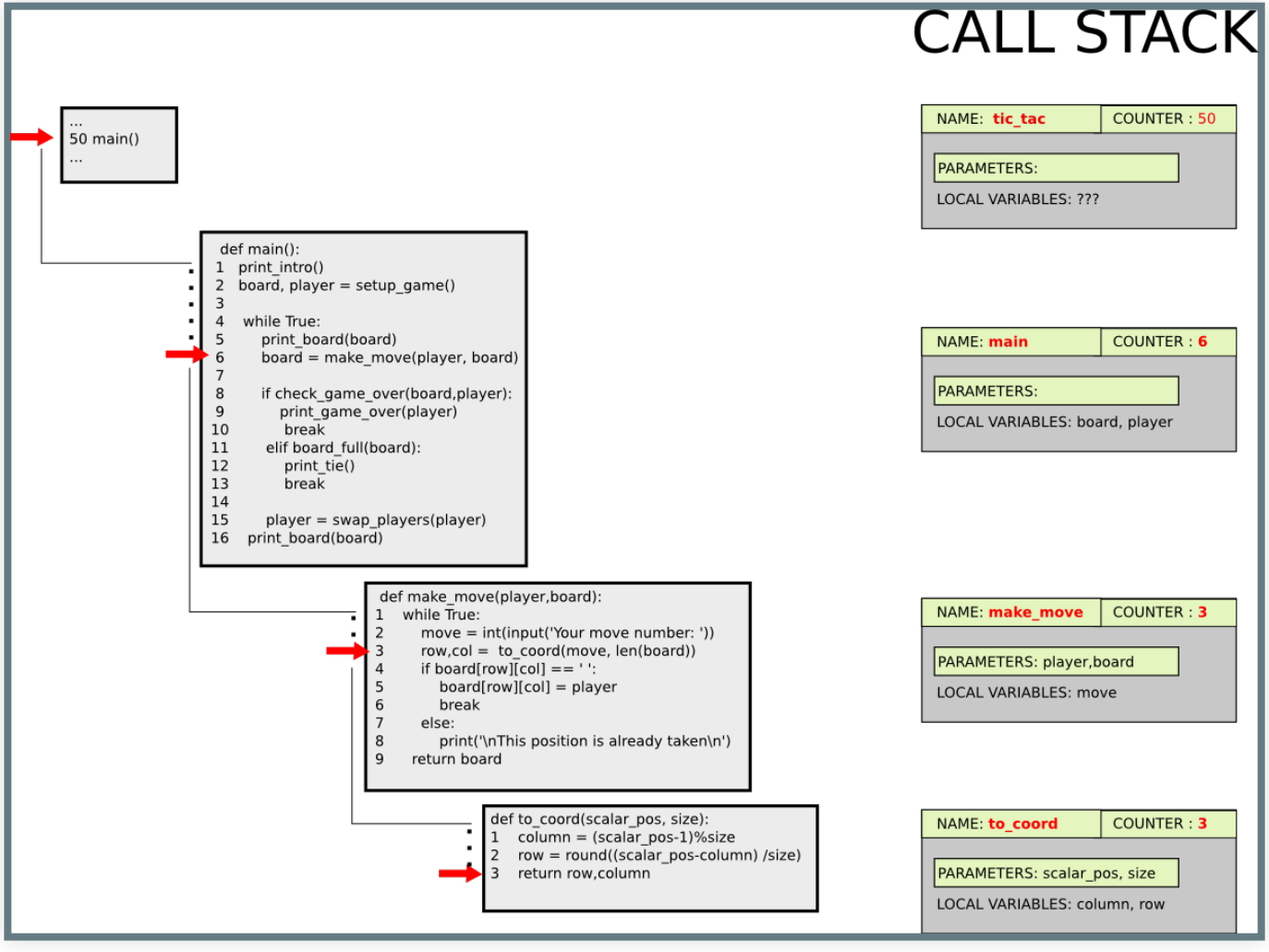
```
d = {...}
if key in d:
    return d[key] ** 2
else:
    return None
```

```
d = {...}
try:
    return d[key] ** 2
except KeyError:
    return None
```

DEBUGGING - FRAME



DEBUGGING - CALL STACK



EXERCISES

DEBUGGING

```
def count(sequence, target=None):
    if not target:
        return len(sequence)
    else:
        count = 0
        for item in sequence:
            count += item == target
        return count


def my_sum(sequence):
    result = 0
    for i in sequence:
        result += i
    return result
```

AVG - EMPTY

Make following code return `0.0` when `sequence` is empty.

```
>>> def avg(sequence):
...     return sum(sequence) / len(sequence)
...
>>> avg([])
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
  File "<stdin>", line 2, in avg
ZeroDivisionError: division by zero
```

```
>>> avg()
0.0
```

SELECTION - INT TYPE

```
 >>> selection = int(input('Select an option from (1, 2, 3): '))
Select an option from (1, 2, 3): one
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
ValueError: invalid literal for int() with base 10: 'one'
```

```
Please insert a number, 'one' is not a number
```

INTERACTIVE CP - FileNotFoundError

```
$ python interactive_copy.py
Read file: asdfa
Traceback (most recent call last):
  File "interactive_copy.py", line 5, in <module>
        with open(read_file_path) as file:
FileNotFoundError: [Errno 2] No such file or directory: 'asdfa'
</module>
```

```
$ python interactive_copy.py
Read file: asdfa
FileNotFoundError: [Errno 2] No such file or directory: 'asdfa'
Read file: gifts.txt
Write file: ...
```

END