Python Fundamentals

Files and Resource Management

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pluralsight
hardcore developer training

open()

open a file

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file: path to file (required)

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file: path to file (required)

mode: read/write/append, binary/text

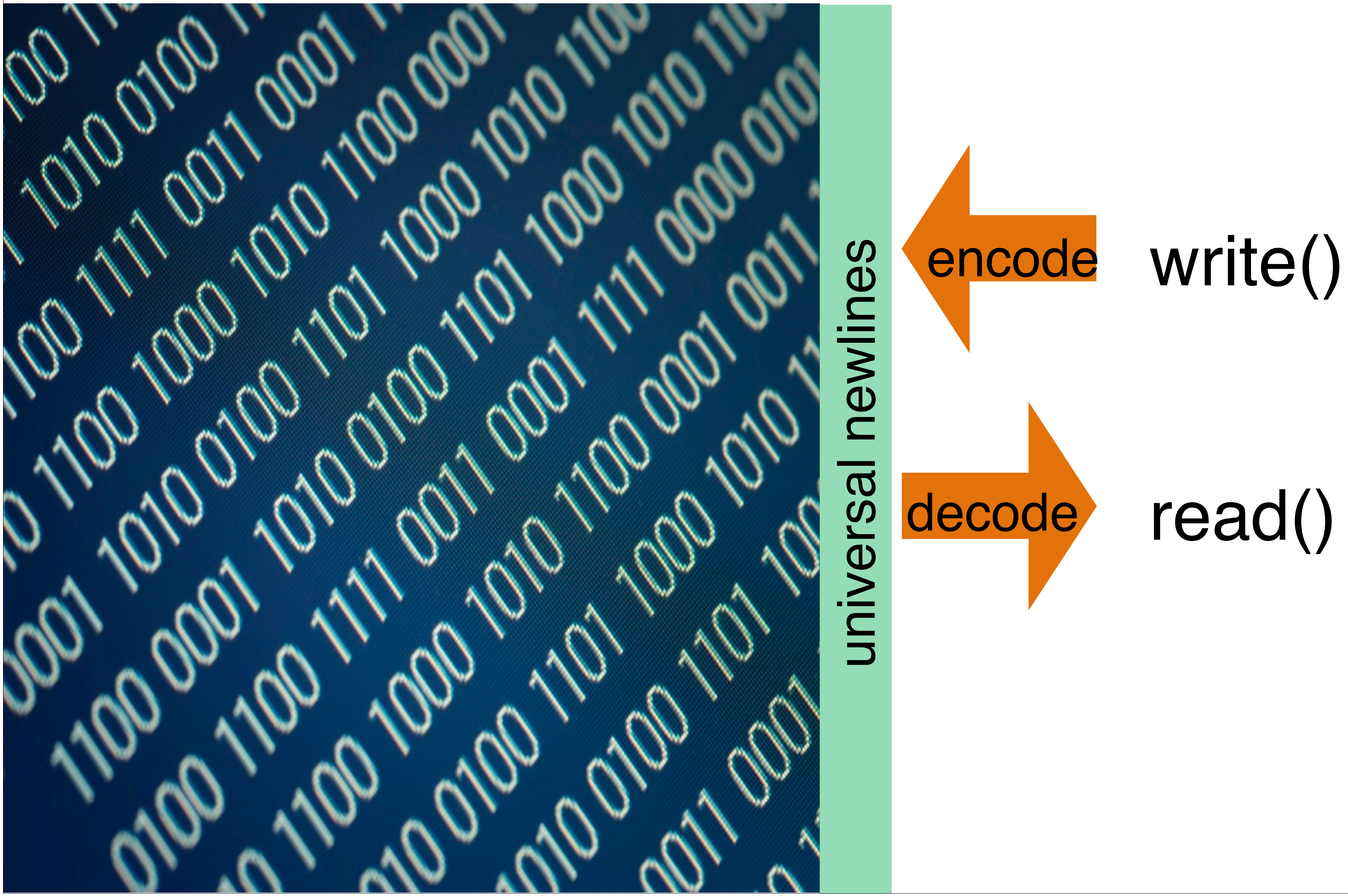
encoding: text encoding

Binary File Access

write()

read()

Text File Access



universal newlines

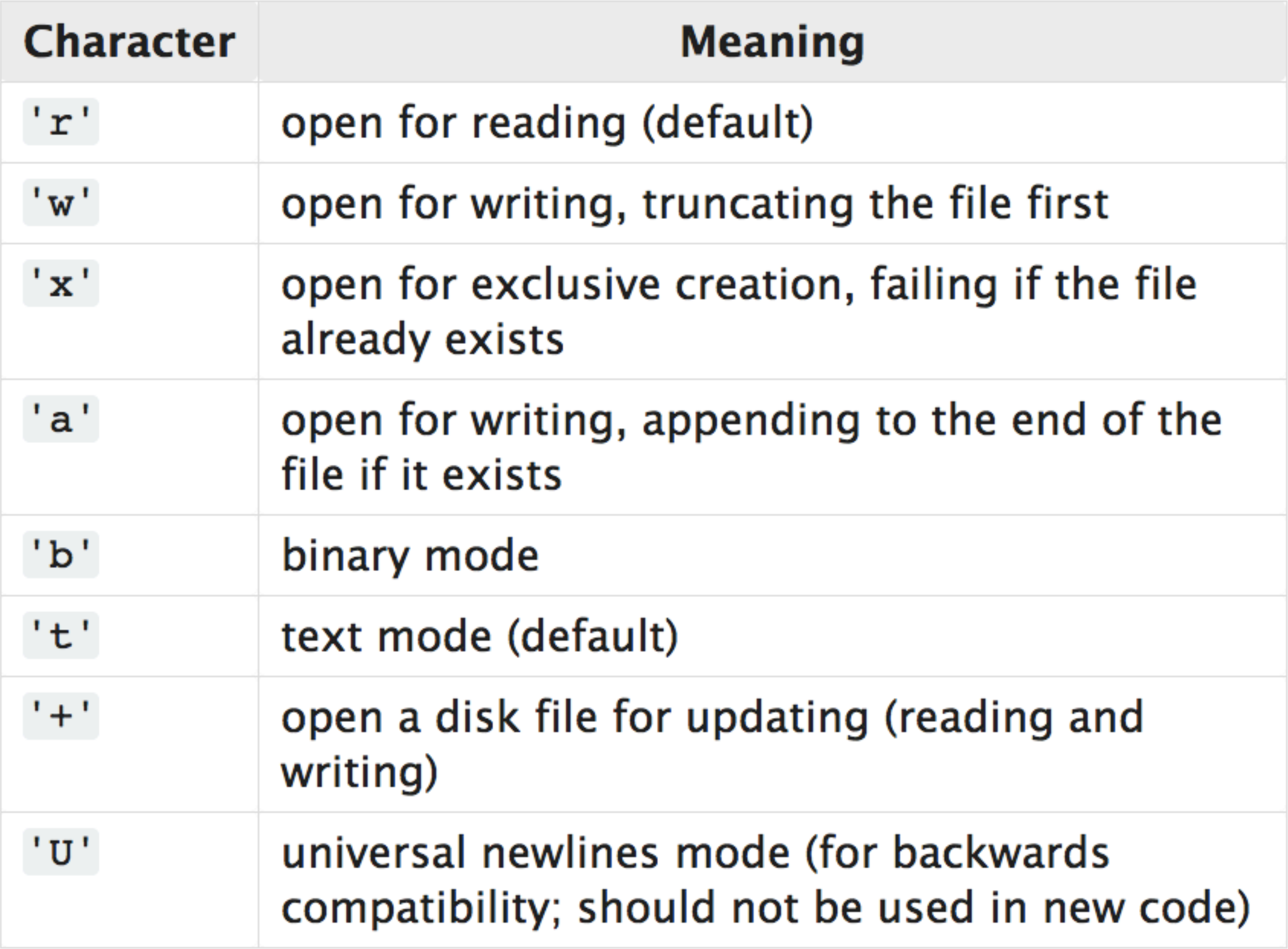
encode

write()

decode

read()

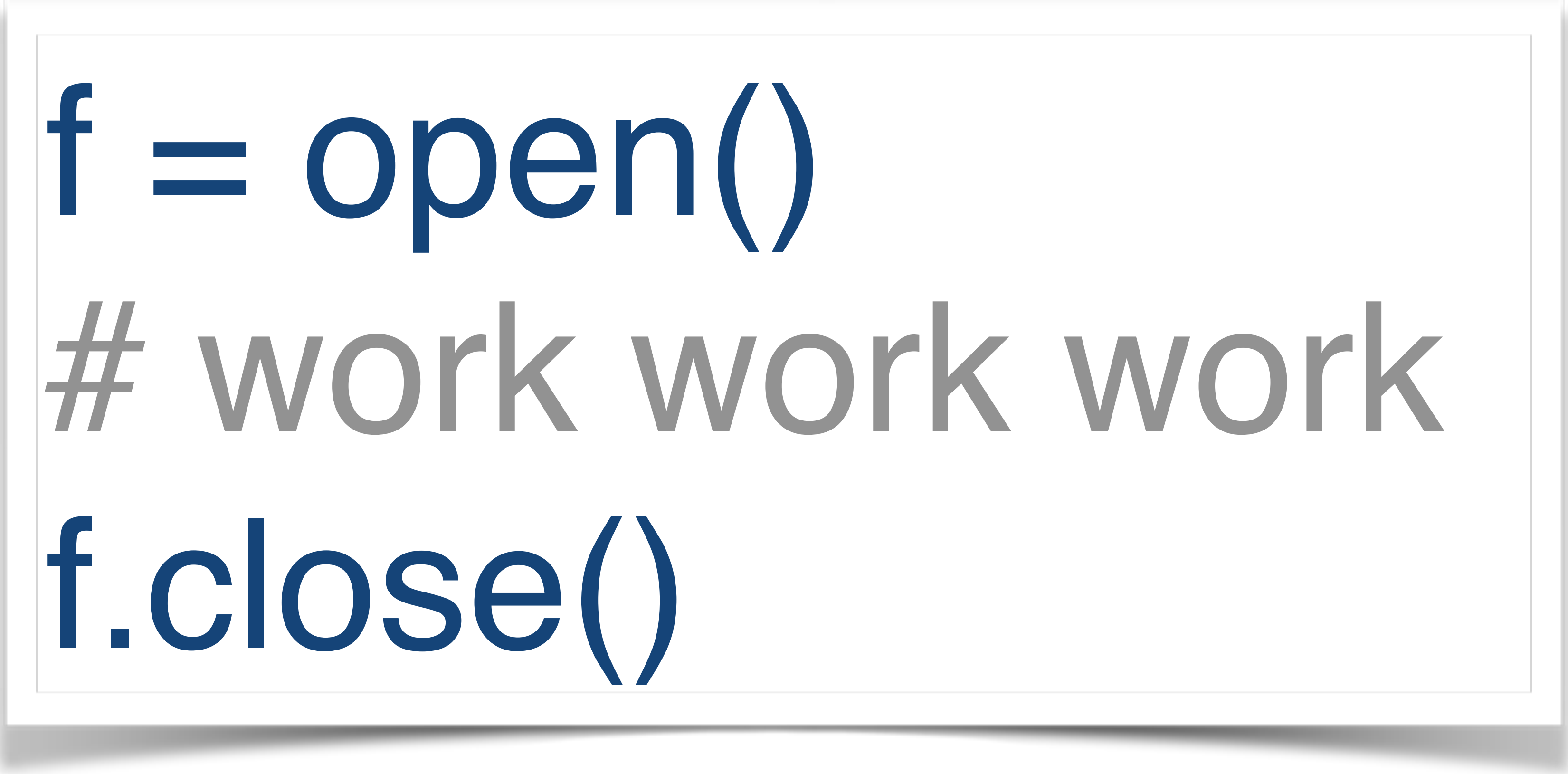
open() modes



Character	Meaning
`'r'`	open for reading (default)
`'w'`	open for writing, truncating the file first
`'x'`	open for exclusive creation, failing if the file already exists
`'a'`	open for writing, appending to the end of the file if it exists
`'b'`	binary mode
`'t'`	text mode (default)
`'+'`	open a disk file for updating (reading and writing)
`'U'`	universal newlines mode (for backwards compatibility; should not be used in new code)

write() **returns the number of codepoints, not the number of characters.**

Typical File Use



```
f = open()
# work work work
f.close()
```

Typical File Use

```
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```

close() is required to actually write the data!

with-block

resource cleanup with context-managers

python™

with-block

resource cleanup with context-managers

open() returns a context-manager!

Moment of Zen

Beautiful is better than ugly

Sugary syntax
faultlessness attained through
TODO: Need another syllable!
sweet fidelity

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```
with EXPR as VAR:
    BLOCK
```

Moment of Zen

```
mgr = (EXPR)
exit = type(mgr).__exit__  # Not calling it yet
value = type(mgr).__enter__(mgr)
exc = True
try:
    try:
        VAR = value  # Only if "as VAR" is present
        BLOCK
    except:
        # The exceptional case is handled here
        exc = False
        if not exit(mgr, *sys.exc_info()):
            raise
        # The exception is swallowed if exit() returns true
finally:
    # The normal and non-local-goto cases are handled here
    if exc:
        exit(mgr, None, None, None)
```

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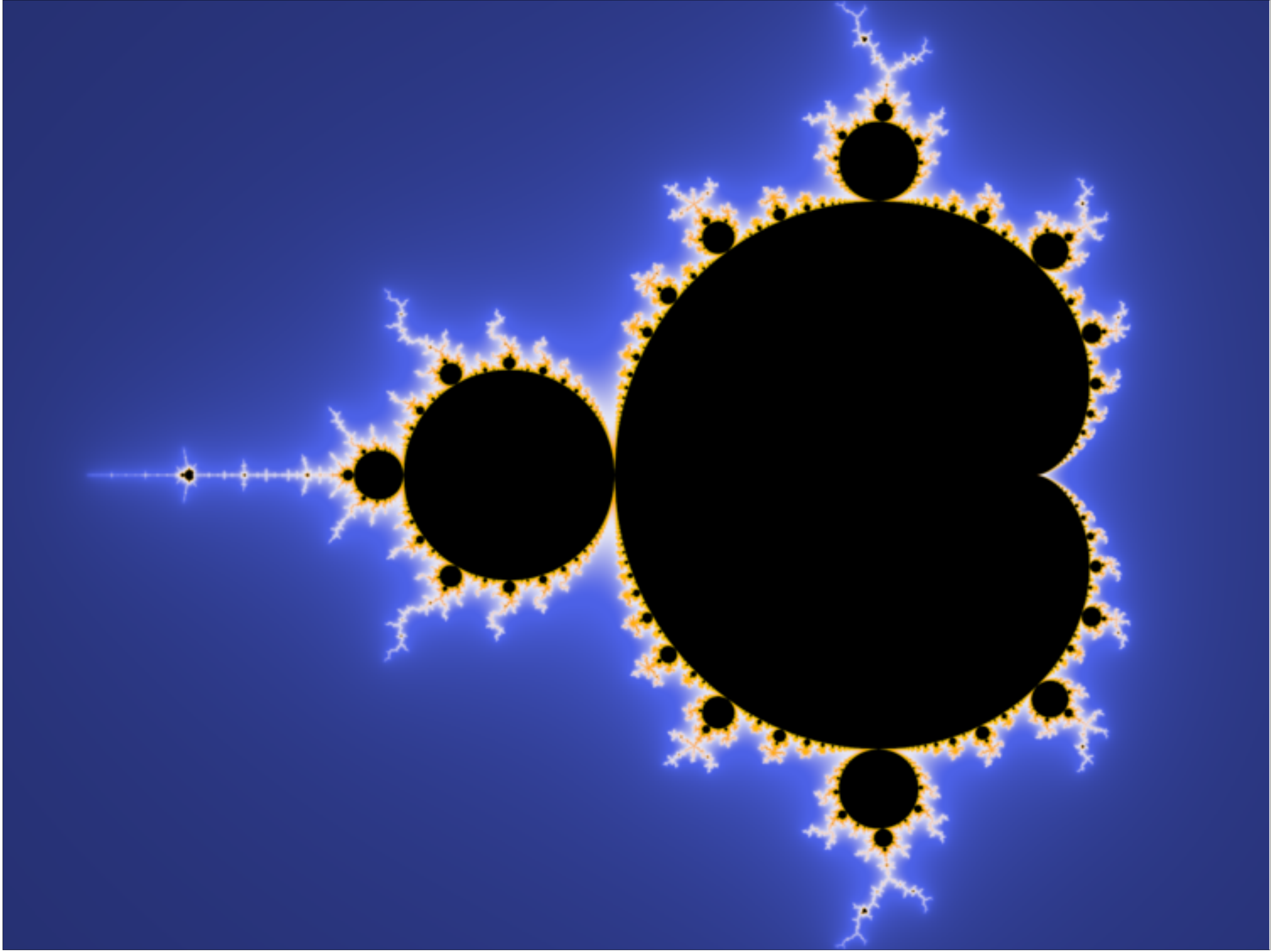
Binary files

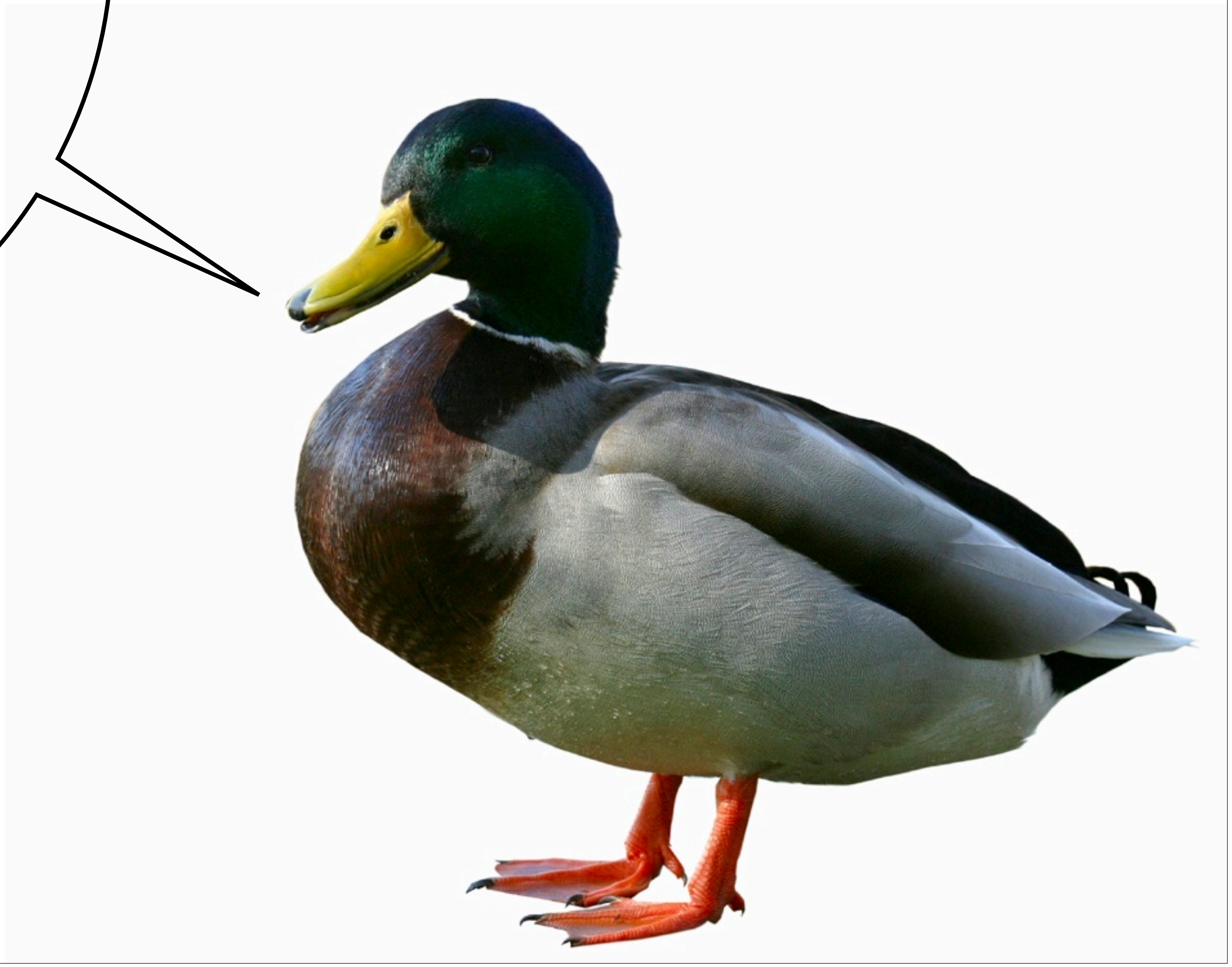
Device independent bitmaps



file-like objects

loosely-define set of behaviors for things that act like files

If it looks like a file and reads like a file, then it



Files and resource management
Summary

- Files are opened using the built-in open() function which accepts a file mode to control read/write/append behavior and whether the file is to be treated as raw binary or encoded text data
- For text data you should specify a text encoding
- Text files deal with string objects and perform universal newline translation and string encoding
- Binary files deal with bytes objects with no newline translation or encoding
- When writing files, it's our responsibility to provide newline characters for line breaks
- Files should always be closed after use
- Files provide various line-oriented methods for reading, and are also iterators which yield line by line
- Files are context managers and the with-statement can be used with context managers to ensure that clean up operations, such as closing files, are performed
- The notion of file-like-objects is loosely defined, but very useful in practice
  - Exercise EAFP to make the most of them
- Context managers aren't restricted to file-like-objects. We can use tools in the contextlib standard library module, such as the closing() wrapper to create our own context managers

Files and resource management Summary

- help() can be used on instance objects, not just types
- Python supports bitwise operators &, | and left- and right-shifts

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