

# Context Managers

*Advanced Python Programming*

—

Valerio Velardo - The Sound of AI

# What's a context manager?

---

*Object that defines a runtime  
context executing within the **with**  
statement*

# Context manager syntax

---

```
with context as cont:  
    ...
```

# Context manager syntax

---

- *with* statement creates new context manager

```
with context as cont:
```

```
...
```

# Context manager syntax

---

- *with* statement creates new context manager
- An object may be returned

```
with context as cont:  
    ...
```

# Context manager syntax

---

- *with* statement creates new context manager
- An object may be returned
- After the *with* block, context is teared down

```
with context as cont:  
    ...
```

# Context manager protocol

---

- To create a custom class-based context manager, implement 2 magic methods: `__enter__()`, `__exit__()`

# Context manager protocol

---

- To create a custom class-based context manager, implement 2 magic methods: `__enter__()`, `__exit__()`
- `__enter__()` sets up the context and can return a value optionally (not the context object!)



# Context manager protocol

---

- To create a custom class-based context manager, implement 2 magic methods: `__enter__()`, `__exit__()`
- `__enter__()` sets up the context and can return a value optionally (not the context object!)
- `__exit__()` tears down the context

# Context manager flow

---

# Context manager flow

---

1. with -> instantiate context manager object

# Context manager flow

---

1. `with` -> instantiate context manager object
2. `__enter__()` -> set up context / return object

# Context manager flow

---

1. `with` -> instantiate context manager object
2. `__enter__()` -> set up context / return object
3. `# do stuff`

# Context manager flow

---

1. `with` -> instantiate context manager object
2. `__enter__()` -> set up context / return object
3. `# do stuff`
4. `__exit__()` -> clean up context / called if exceptions occurs

# What are context managers good for?

---

- Manipulate files (open / close)
- Access databases (connect / disconnect)
- Manage threads (start / stop)
- Create / delete resources
- ...