

# Decorators: Advanced: Takeaways

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## Syntax

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### PRESEVE METADATA FOR DECORATED FUNCTIONS

- Use `functools.wraps()` to make sure your decorated functions maintain their metadata:

```
from functools import wraps

def timer(func):
    """A decorator that prints how long a function took to run."""
    @wraps(func)
    def wrapper(*args, **kwargs):
        t_start = time.time()

        result = func(*args, **kwargs)

        t_total = time.time() - t_start

        print('{} took {}'.format(func.__name__, t_total))

        return result

    return wrapper
```

### ADD ARGUMENTS TO DECORATORS

- To add arguments to a decorator, turn it into a function that returns a decorator:

```
def timeout(n_seconds):
    def decorator(func):
        @wraps(func)
        def wrapper(*args, **kwargs):
            # Set an alarm for n seconds
            signal.alarm(n_seconds)

            try:
                # Call the decorated func
                return func(*args, **kwargs)
            finally:
                # Cancel alarm
                signal.alarm(0)

        return wrapper

    return decorator
```

## Concepts

- One of the problems with decorators is that they obscure the decorated function's metadata. The `wraps()` function from the `functools` module is a decorator that you use when defining a decorator. If you use it to decorate the wrapper function that your decorator returns, it will modify `wrapper()`'s metadata to look like the function you are decorating.
- To add arguments to a decorator, we have to turn it into a function that returns a decorator, rather than a function that is a decorator.

## Resources

- [The `functools` module](#)



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