# Middleware

You can add middleware to **FastAPI** applications.

A "middleware" is a function that works with every **request** before it is processed by any specific *path operation*. And also with every **response** before returning it.

- It takes each **request** that comes to your application.
- It can then do something to that **request** or run any needed code.
- Then it passes the **request** to be processed by the rest of the application (by some *path operation*).
- It then takes the **response** generated by the application (by some *path operation*).
- It can do something to that **response** or run any needed code.
- Then it returns the **response**.

> ✏️ **Technical Details**
>
> If you have dependencies with `yield`, the exit code will run *after* the middleware.
>
> If there were any background tasks (documented later), they will run *after* all the middleware.

## Create a middleware

To create a middleware you use the decorator `@app.middleware("http")` on top of a function.

The middleware function receives:

- The `request`.
- A function `call_next` that will receive the `request` as a parameter.
    - This function will pass the `request` to the corresponding *path operation*.
    - Then it returns the `response` generated by the corresponding *path operation*.
- You can then modify further the `response` before returning it.

```
{!../../../docs_src/middleware/tutorial001.py!}
```

> 🔥 **Tip**
>
> Have in mind that custom proprietary headers can be added using the 'X-' prefix.
>
> But if you have custom headers that you want a client in a browser to be able to see, you need to add them to your CORS configurations (CORS (Cross-Origin Resource Sharing)) using the parameter `expose_headers` documented in Starlette's CORS docs.

> ✏️ **Technical Details**
>
> You could also use `from starlette.requests import Request`.
>
> **FastAPI** provides it as a convenience for you, the developer. But it comes directly from Starlette.

## Before and after the `response`

You can add code to be run with the `request`, before any *path operation* receives it.

And also after the `response` is generated, before returning it.

For example, you could add a custom header `X-Process-Time` containing the time in seconds that it took to process the request and generate a response:

```
{!../../../docs_src/middleware/tutorial001.py!}
```

# Other middlewares

You can later read more about other middlewares in the Advanced User Guide: Advanced Middleware.

You will read about how to handle CORS with a middleware in the next section.

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