# Asynchronous Programming



→ What is difference b/w Synchronous & Asynchronous programming ?

→ In Synchronous programming, one thing happens at a time. When we call a function that performs a long-running action, it returns a result when the action has finished. This stops the program for the time the action takes. In contrast, asynchronous programming allows multiple things to happen at the same time. When we start an action, the program continues to run. When the action finishes, the program is informed and gets the result.

→ Let's compare Synchronous and asynchronous programming using an example: A program that fetches two resources from the network and then combines results.

→ In Synchronous programming, where the request function returns only after it has done its work. To perform this task, we make the requests one after the other. Here the drawback is that the second request will be started only when the first has finished. Suppose the time taken by the first request is 12 seconds, and the time taken by the second request is 13 seconds, so the total time will be the sum of the two response times.

→ In Asynchronous programming, the functions that perform a slow action takes an extra argument, a callback function. The action is started, and when it finishes, the callback function is called with the result. For ex: The setTimeout function waits a given number of milliseconds and then calls a function.

→ Waiting is useful when doing something like updating an animation or checking whether something takes longer than a given amount of time.

Performing multiple asynchronous actions in a row using callback means that we have to

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Keep passing new functions to handle the program's continuation after the actions.

→ SYNCHRONOUS Vs ASYNCHRONOUS PROGRAMMING:

→ Any computation we do requires processor for our Javascript engine to get the job done!
→ Many requests interact with things outside of the processor. For ex: they may communicate over a network or request data from the storage disk.
→ This is a lot slower than getting it from memory.
→ We don't want our processor to sit idle when such things are happening.
→ An Asynchronous model allows multiple things to happen at the same time.
→ In a Synchronous programming model, things happen one at a time.
→ When you call a function that performs a long action, it returns only when the action has finished so that it can return the result.
→ This stops your program for the time the action takes.

→ FEW Ways to write Asynchronous code in Javascript:

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-> ASYNC / AWAIT

-> CALLBACKS

-> PROMISES