# System calls

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* System calls is the way user programs request services from the OS.
* System calls use software interrupts.
  - → open (filename, mode)
  - → read (file, buffer, size)
  - → write (file, buffer, size)
  - → fork()
  - → execve (cmd, args)
* Difference between software interrupts (system call) and function calls?

  System calls / software interrupts switch from user mode to kernel mode. OS needs privileged instructions that can be only executed in kernel mode.

* Functions jumps from one function to another but system call jumps to OS.

* Operations that need to be executed by the OS or kernel mode are included in system calls.
  sin(x), cos(x) are not system calls.
  malloc (size) is not system calls but it might call another functions that might be a system calls.

* Example of system calls

  write (fd, buff, n)
  - fd → file descriptor
  - buff → buffer size (memory range)

⇒ System call to write to disk.
⇒ Memory range → [buff, buff + n − 1]
⇒ OS checks whether fd is a valid file with write permission.
⇒ OS checks if memory range is valid.
⇒ If any check fails then it returns −1 and set errno.