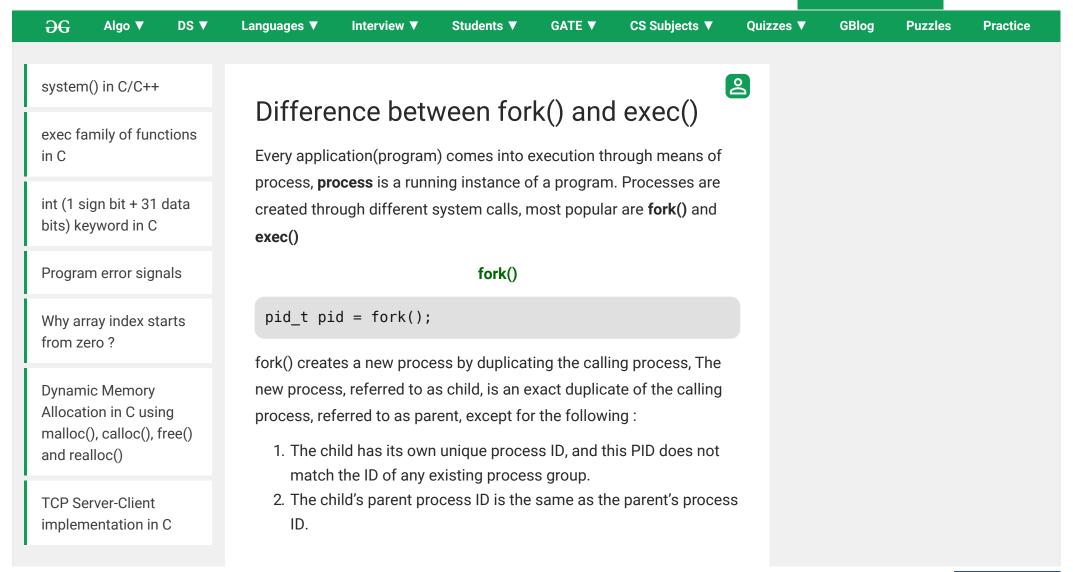


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- 3. The child does not inherit its parent's memory locks and semaphore adjustments.
- 4. The child does not inherit outstanding asynchronous I/O operations from its parent nor does it inherit any asynchronous I/O contexts from its parent.

Return value of fork()

On success, the PID of the child process is returned in the parent, and 0 is returned in the child. On failure, -1 is returned in the parent, no child process is created, and errno is set appropriately.

Detailed article on fork system call

exec()

The exec() family of functions **replaces** the current process image with a new process image. It loads the program into the current process space and runs it from the entry point.

The exec() family consists of following functions, I have implemented **execv()** in following C program, you can try rest as an exercise

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char *const envp[]);

fork vs exec

- fork starts a new process which is a copy of the one that calls it, while exec replaces the current process image with another (different) one.
- Both parent and child processes are executed simultaneously in case of fork() while Control never returns to the original program unless there is an exec() error.

```
// exec() system call for process creation
   #include <stdio.h>
   #include <sys/types.h>
   #include <unistd.h>
   #include <stdlib.h>
   #include <errno.h>
   #include <sys/wait.h>
   int main(){
      pid t pid;
      int ret = 1;
      int status;
      pid = fork();
      if (pid == -1){
        // pid == -1 means error occured
        printf("can't fork, error occured\n");
        exit(EXIT FAILURE);
      else if (pid == 0){
```

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#pragma Directive in
C/C++

```
// pid == 0 means child process created
  // getpid() returns process id of calling pro
  printf("child process, pid = %u\n", getpid())
  // the argv list first argument should point
  // filename associated with file being execut
  // the array pointer must be terminated by NI
  // pointer
  char * argv list[] = {"ls","-lart","/home",Nl
  // the execv() only return if error occured.
  // The return value is -1
  execv("ls",argv list);
  exit(0);
else{
  // a positive number is returned for the pid
  // parent process
  // getppid() returns process id of parent of
  // calling process
  printf("parent process, pid = %u\n",getppid()
    // the parent process calls waitpid() on th
    // waitpid() system call suspends execution
    // calling process until a child specified
    // argument has changed state
    // see wait() man page for all the flags or
     // used here
    if (waitpid(pid, &status, 0) > 0) {
        if (WIFEXITED(status) && !WEXITSTATUS(:
          printf("program execution successful")
        else if (WIFEXITED(status) && WEXITSTA
             if (WEXITSTATUS(status) == 127) {
                 // execv failed
                 printf("execv failed\n");
```

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Output:

```
parent process, pid = 11523
child process, pid = 14188
Program execution successfull
```

References:

Linux man pages

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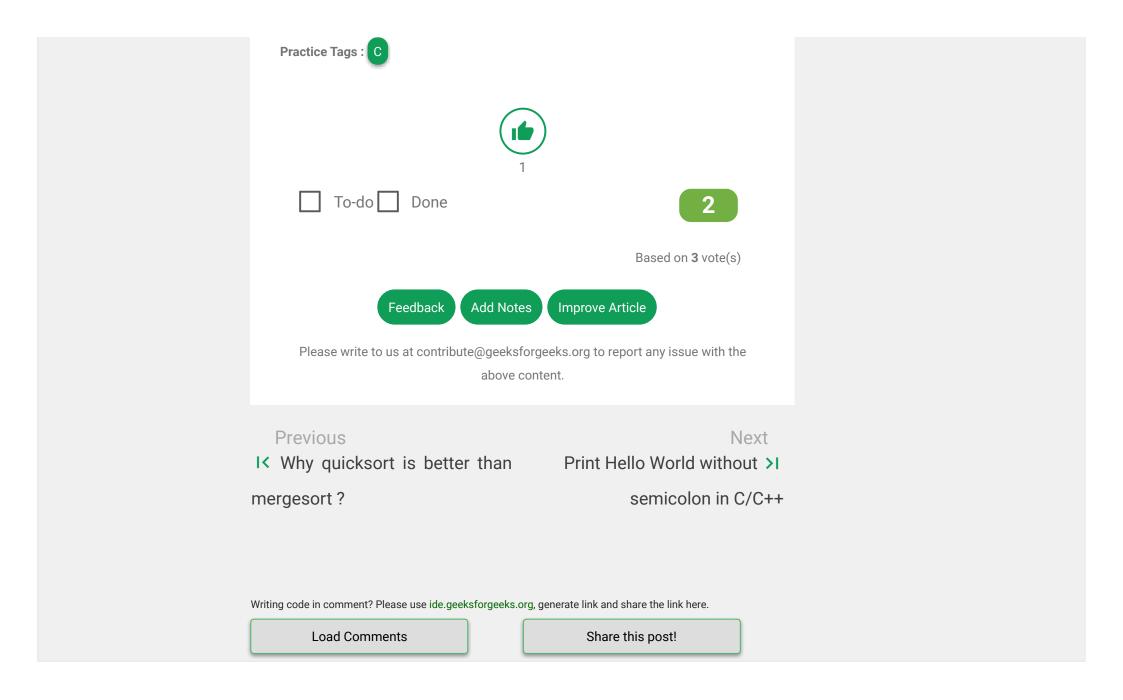
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