System Call Solutions - Lab Assignment 4

# Process Management System Calls

## fork()

Creates a new child process by duplicating the calling process.

Example:

pid\_t pid = fork();  
if (pid == 0) {  
 printf("Child process\n");  
} else {  
 printf("Parent process\n");  
}

## exec()

Replaces the current process image with a new process image.

Example:

execl("/bin/ls", "ls", "-l", NULL);

## wait()

Makes the parent process wait until child process finishes.

Example:

int status;  
wait(&status);

## exit()

Terminates the current process.

Example:

exit(0);

# File Management System Calls

## open()

Opens a file and returns a file descriptor.

Example:

int fd = open("file.txt", O\_RDONLY);

## read()

Reads data from a file descriptor.

Example:

char buffer[100];  
read(fd, buffer, sizeof(buffer));

## write()

Writes data to a file descriptor.

Example:

write(fd, "Hello", 5);

## close()

Closes the file descriptor.

Example:

close(fd);

# Device Management System Calls

## read()/write()

Used for device files like /dev/tty.

## ioctl()

Device-specific input/output operations.

Example:

ioctl(fd, IOCTL\_CMD, arg);

## select()

Monitors multiple file descriptors for readiness.

Example:

fd\_set readfds;  
FD\_ZERO(&readfds);  
FD\_SET(fd, &readfds);  
select(fd+1, &readfds, NULL, NULL, NULL);

# Network Management System Calls

## socket()

Creates a socket.

Example:

int sockfd = socket(AF\_INET, SOCK\_STREAM, 0);

## connect()

Connects to a remote server.

Example:

connect(sockfd, (struct sockaddr\*)&server\_addr, sizeof(server\_addr));

## send()

Sends data through socket.

Example:

send(sockfd, msg, strlen(msg), 0);

## recv()

Receives data from socket.

Example:

recv(sockfd, buffer, sizeof(buffer), 0);

# System Information Management System Calls

## getpid()

Returns the process ID.

Example:

pid\_t pid = getpid();

## getuid()

Returns the user ID of the process.

Example:

uid\_t uid = getuid();

## gethostname()

Gets the host name of the system.

Example:

char hostname[1024];  
gethostname(hostname, 1024);

## sysinfo()

Gets system statistics.

Example:

struct sysinfo info;  
sysinfo(&info);