**Part 1**

1. memset(&pcb, 0, sizeof(pcb\_t));

#define MAXLINE 128

#define MAXWORD 20

char buf[MAXLINE];

while(fgets(buf,MAXLINE,stdin) != NULL) {

if (strlen(buf) > 0 && buf[strlen(buf)-1] == ‘/n’) {

buf[strlen(buf)-1] = ‘\0’

}

}



#define MAXLINE 128

#define MAXWORD 20

char buf[MAXLINE];

char WSPACE[] = “\n \t”;

int count = 0;

char\* tokens[MAXWORD];

while(fgets(buf,MAXLINE,stdin) != NULL) {

char\* tok = strtok(inStr, WSPACE);

while (tok != NULL) {

tokens[count] = tok;

count++;

tok = strtok(NULL, WSPACE);

}

}

The data structure used for storing each token is an array of char pointers called tokens.



printf(strerror(errno));

**Part 2**



Command line: “./a1p2 w”

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | PID | PPID | State | CMD |
| 1. (a1p2 Process) | 2638257 | 2636030 | S+ | ./a1p2 w |
| 2. (child Process) | 2638258 | 2638257 | S+ | /bin/sh ./myclock.txt out1 |
| 3. (grand child (if any)) | 2638262 | 2638258 | S+ | sleep 2 |
| 4. (a1p2 Process) | N/A | N/A | N/A | N/A |
| 5. (child Process) | 2638258 | N/A | S | /bin/sh ./myclock.txt out1 |
| 6. (grand child (if any)) | 2639176 | 2638258 | S | sleep 2 |

We can see that the PPID for the 2. (child process) is 1.(a1p2 process) and the PPID for 3. (grand child) is 2. (child process), similar to 5.(child process) and 6.(grand child).

State S+ can be separated into ‘S’ and ‘+’. The S refers to a state that is sleeping and waiting for an event to occur. The ‘+’ symbol added means that the process can be interrupted if given a signal. The ‘S’ without the + means that the state is in an uninterruptible sleep state, and will have to be terminated.

2. Command line: “./a1p2 s”

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | PID | PPID | State | CMD |
| 1. (a1p2 Process) | 2640968 | 2636030 | S+ | ./a1p2 s |
| 2. (child Process) | 2640969 | 2640968 | S+ | /bin/sh ./myclock.txt out1 |
| 3. (grand child (if any)) | 2640973 | 2640969 | S+ | sleep 2 |
| 4. (a1p2 Process) | 2640968 | 2636030 | S+ | ./a1p2 s |
| 5. (child Process) | 2640969 | 2640968 | Z+ | [myclock.txt] <defunct> |
| 6. (grand child (if any)) | N/A | N/A | N/A | N/A |

Similar to above, we can see the relation between the PPID and PID for some of the processes.

A Z+ state refers to a ‘Zombie’ process, or a process that has complete its execution and its exit code is still available to a parent process.

**Part 3**

The output for 0 produces every time as 0 seconds

For 1 and -1 the real time is 5 seconds and every other time is 0 seconds.