

Задание 5:

В программу с программным каналом включить собственный обработчик сигнала. Использовать сигнал для изменения хода выполнения программы.

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1. #include <stdio.h>
2. #include <stdlib.h>
3. #include <unistd.h>
4. #include <string.h>
5. #include <signal.h>
6. #include <time.h>
7. #include <sys/wait.h>
8.
9. #define LEN 100
10. #define DELAY 2
11.
12. int p_flag = 0;
13.
14. void catch_sig(int signum) {
15.     printf("Process %d: caught signal %d\n", getpid(), signum);
16.     p_flag = 1;
17. }
18.
19. int main() {
20.     //Pipe
21.     int fd[2];
22.     if (pipe(fd) == -1)
23.     {
24.         perror("Couldn't pipe.");
25.         exit(1);
26.     }
27.     // Ctrl + Z
28.     void (*old_handler)(int) = signal(SIGTSTP, catch_sig);
29.
30.     // Child 1
31.     pid_t child1 = fork();
32.     if (child1 == -1)
33.     {
34.         perror("Couldn't fork.");
35.         exit(1);
36.     }
37.     else if (child1 == 0)
38.     {
39.         while (!p_flag) ;
40.         close(fd[0]);
41.         char msg1[] = "Hello From Child 1 ";
42.         write(fd[1], msg1, LEN);
43.         printf("Child 1: writen [%s] to Pipe\n", msg1);
44.     }
45.
46.     // Child 2
47.     pid_t child2 = fork();
48.     if (child2 == -1)
49.     {
50.         perror("Couldn't fork.");
51.         exit(1);
52.     }
53.     else if (child2 == 0)
54.     {
55.         while (!p_flag) ;
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56.     close(fd[0]);
57.     char msg2[] = "Hello From Child 2 ";
58.     write(fd[1], msg2, LEN);
59.     printf("Child 2: writen [%s] to Pipe\n", msg2);
60. }
61. // Parent
62. if (child1 != 0 && child2 != 0)
63. {
64.     printf("Parent: pid = %d\n", getpid());
65.     printf("Child 1: pid = %d\n", child1);
66.     printf("Child 2: pid = %d\n", child2);
67.     printf("Parent: waiting for CTRL+Z signal\n");
68.     while (!p_flag);
69.
70.     int status1, status2;
71.     pid_t ret1 = wait(&status1);
72.     pid_t ret2 = wait(&status2);
73.
74.     printf("-----\n");
75.     close(fd[1]);
76.     char msg1[LEN], msg2[LEN];
77.     read(fd[0], msg1, LEN);
78.     read(fd[0], msg2, LEN);
79.     printf("Parent: read from Pipe [%s%s]\n", msg1, msg2);
80.
81.     if (WIFEXITED(status1))
82.         printf("Parent: child %d finished with %d code.\n", ret1, WEXITSTATUS(status1));
83.     else if (WIFSIGNALED(status1))
84.         printf("Parent: child %d finished from signal with %d code.\n", ret1, WTERMSIG(status1));
85.     else if (WIFSTOPPED(status1))
86.         printf("Parent: child %d finished from signal with %d code.\n", ret1, WSTOPSIG(status1));
87.
88.     if (WIFEXITED(status2))
89.         printf("Parent: child %d finished with %d code.\n", ret2, WEXITSTATUS(status2));
90.     else if (WIFSIGNALED(status2))
91.         printf("Parent: child %d finished from signal with %d code.\n", ret2, WTERMSIG(status2));
92.     else if (WIFSTOPPED(status2))
93.         printf("Parent: child %d finished from signal with %d code.\n", ret2, WSTOPSIG(status2));
94. }
95. signal(SIGTSTP, old_handler);
96. return 0;
97. }

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nguyensang@K-virtual-machine:~/Desktop/OS2020/2$ ./5.exe
Parent: pid = 25678
Child 1: pid = 25679
Child 2: pid = 25680

Parent: waiting for CTRL+Z signal
^ZProcess 25678: caught signal 20
Process 25680: caught signal 20
Child 2: writen [Hello From Child 2 ] to Pipe
Process 25679: caught signal 20
Child 1: writen [Hello From Child 1 ] to Pipe
-----
Parent: read from Pipe [Hello From Child 2 Hello From Child 1 ]
Parent: child 25680 finished with 0 code.
Parent: child 25679 finished with 0 code.
nguyensang@K-virtual-machine:~/Desktop/OS2020/2$ █

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