

Prima simulazione

```
1  #include<stdlib.h>
2  #include<stdio.h>
3  #include<stdbool.h>
4  #include<unistd.h>
5  #include<sys/wait.h>
6  #include<signal.h>
7  #include<fcntl.h>
8
9  #define ARGOEMNTI 3
10 #define MAXLEAF 10
11
12 FILE * ptr;
13 int v_leaf[MAXLEAF],index_leaf=0;
14
15 void write_pid(){
16     fprintf(ptr,"%d\n",getpid());
17     fflush(ptr);
18 }
19
20 bool file_doesnt_exists(const char * path){
21     FILE *tmp=fopen(path,"r");
22     bool trovato=true;
23     if(tmp!=NULL){
24         trovato=false;
25     }
26     return trovato;
27 }
28
29 void leaf_handler(int signo,siginfo_t* info,void *empty){
30     if(signo==SIGUSR1){
31         kill(info->si_value.sival_int,SIGUSR2);
32     }
33 }
34
35 void generate_leaf(int n_leafs){
36     int i;
37     for(i=0;i<n_leafs;++i){
38         int leaf=fork();
39         if(leaf==0){
40             struct sigaction sl;
41             sl.sa_flags=SA_SIGINFO;
42             sigemptyset(&sl.sa_mask);
43             sl.sa_handler=leaf_handler;
44             sigaddset(&sl.sa_mask,SIGCHLD);
45             sigaddset(&sl.sa_mask,SIGCONT);
46             sigaction(SIGUSR1,&sl,NULL);
47             write_pid();
```

```

48         while (1){
49             pause();
50         }
51     }
52     else{
53         v_leaf[index_leaf]=leaf;
54         index_leaf++;
55     }
56 }
57 }
58
59 void manager_handler(int signo, siginfo_t* info, void *empty){
60     if(signo==SIGUSR1){
61         if(index_leaf>0){
62             index_leaf--;
63             union sigval x_pid;
64             x_pid.sival_int=info->si_pid;
65             sigqueue(v_leaf[index_leaf], SIGUSR1, x_pid);
66         }
67         else{
68             kill(getpid(), SIGKILL);
69         }
70     }
71     if(signo==SIGTERM){
72         index_leaf--;
73         for(; index_leaf>=0; --index_leaf){
74             kill(v_leaf[index_leaf], SIGKILL);
75         }
76         kill(getpid(), SIGKILL);
77     }
78 }
79
80 int main(int argc, char ** argv){
81     int n_argomenti=argc;
82     if(n_argomenti!=ARGOEMNTI){
83         exit(3);
84     }
85     int n_figli=atoi(argv[2]);
86     if(n_figli<1 || n_figli>10){
87         exit(4);
88     }
89     if(!file_doesnt_exists(argv[1])){
90         exit(5);
91     }
92     ptr=fopen(argv[1], "w");
93     write_pid();
94     int manager=fork();
95     if(manager==0){
96         struct sigaction sa;
97         sa.sa_flags=SA_SIGINFO;
98         sa.sa_handler=manager_handler;
99         sigemptyset(&sa.sa_mask);
100         sigaddset(&sa.sa_mask, SIGALRM);
101         sigaction(SIGUSR1, &sa, NULL);
102         sigaction(SIGTERM, &sa, NULL);
103         write_pid();

```

```
104         generate_leaf(n_figli);
105         while (1)pause();
106     }
107     else{
108         while(wait(NULL)>0);
109     }
110     return 0;
111 }
```