Министерство цифрового развития

Федеральное государственное бюджетное образовательное учреждение высшего образования
«Сибирский государственный университет телекоммуникаций и информатики»
(СибГУТИ)

Кафедра прикладной математики и кибернетики

Отчёт

по лабораторной работе № 1 «Среда пользователя UNIX»

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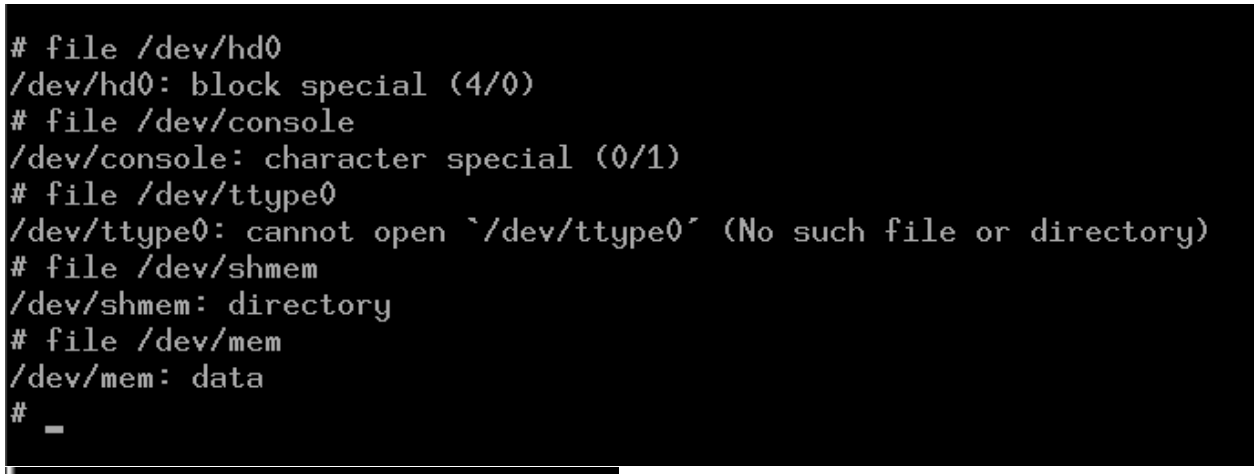
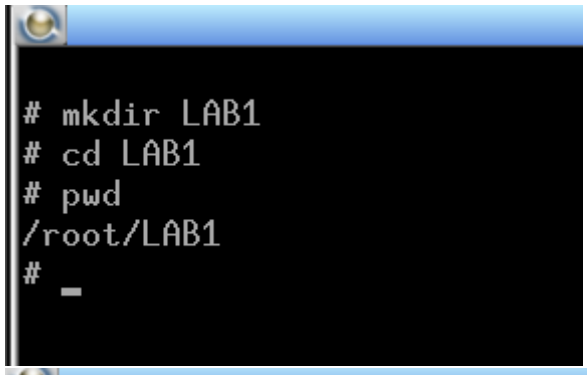
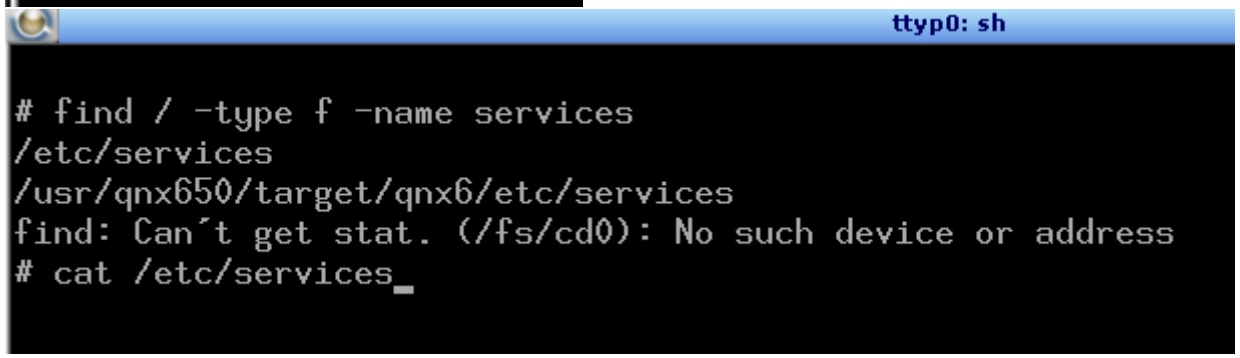
Работа с командной строкой

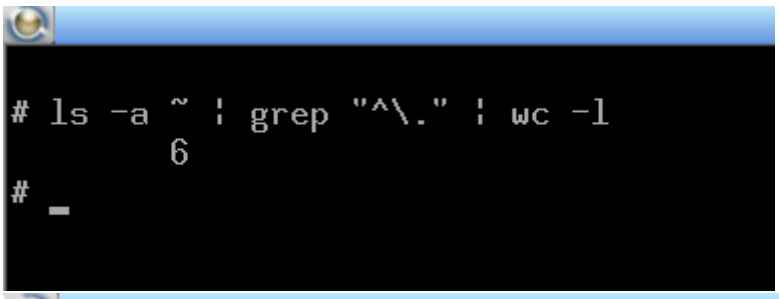
1. 

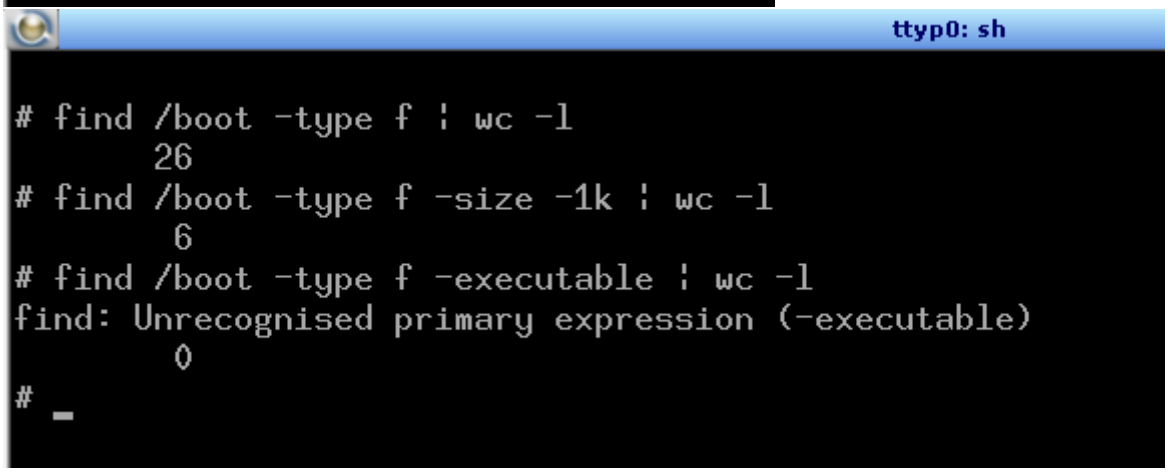
2. 

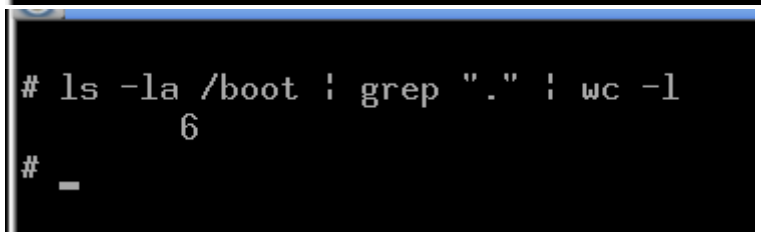
Рабочим каталогом становится домашний каталог пользователя, указанный в /etc/passwd

3. 

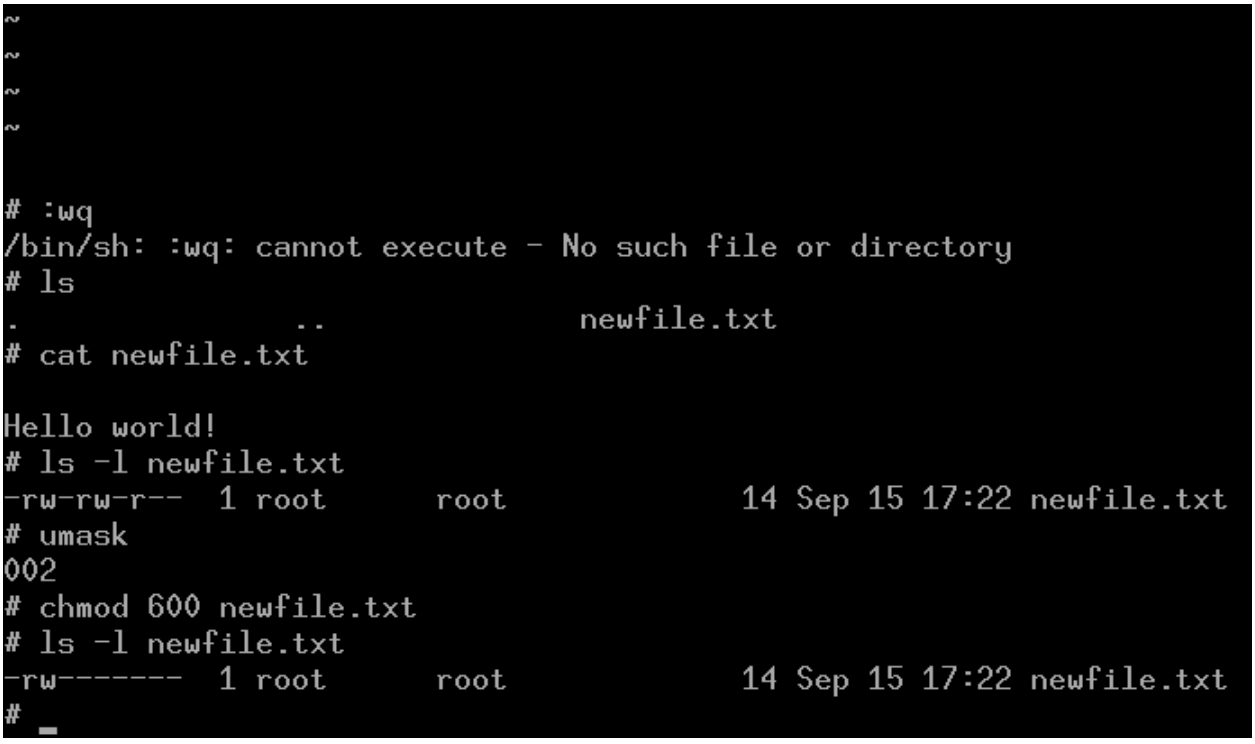
4. 

5. 

6. 

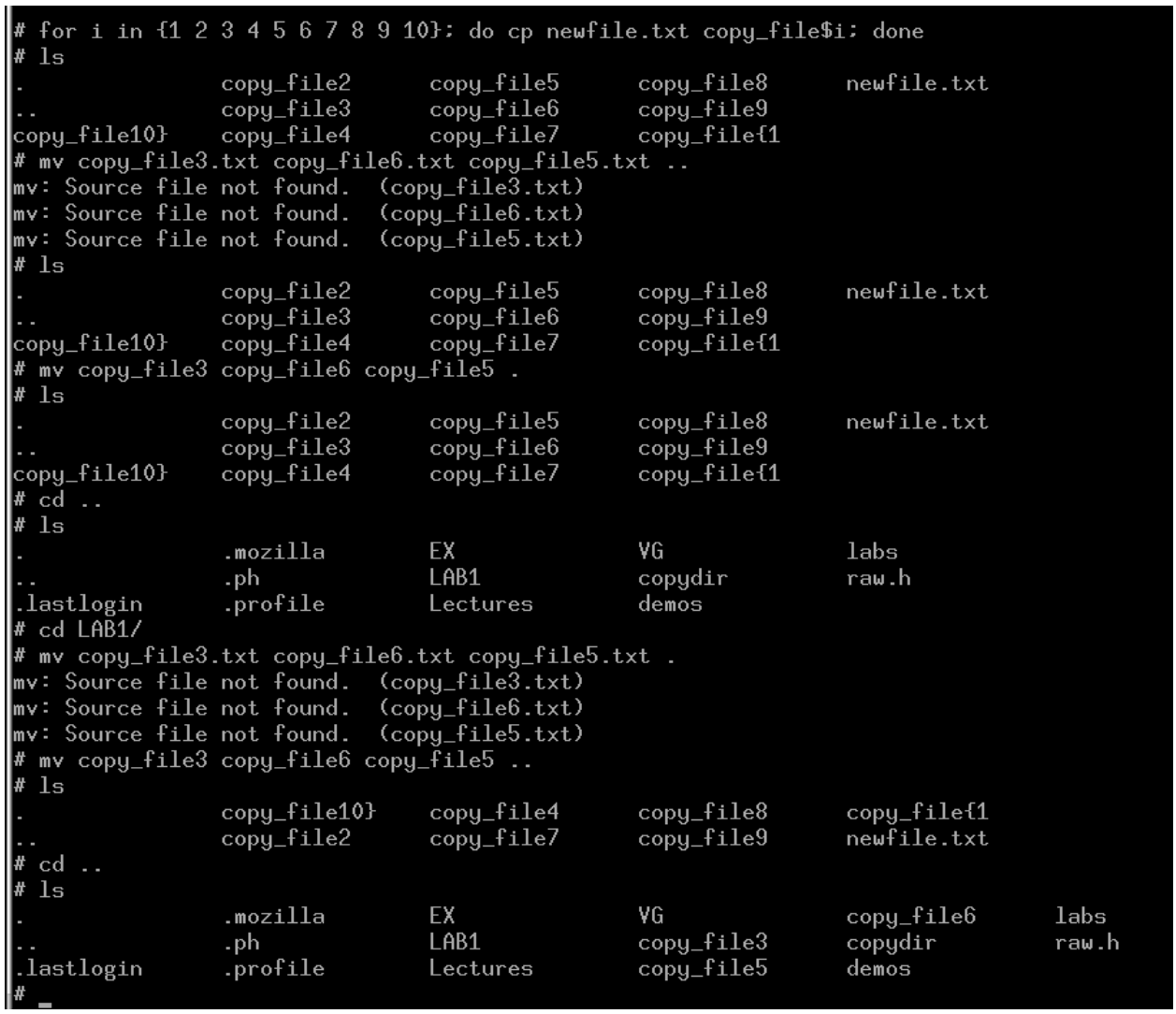
7. 

У каталогов всегда минимум 2 жёсткие ссылки – сам каталог и ссылка внутри него

8. 

Установленные права определяются umask

9.



```
# for i in {1 2 3 4 5 6 7 8 9 10}; do cp newfile.txt copy_file$i; done
# ls
.               copy_file2      copy_file5      copy_file8      newfile.txt
..              copy_file3      copy_file6      copy_file9
copy_file10}    copy_file4      copy_file7      copy_file{1
# mv copy_file3.txt copy_file6.txt copy_file5.txt ..
mv: Source file not found.  (copy_file3.txt)
mv: Source file not found.  (copy_file6.txt)
mv: Source file not found.  (copy_file5.txt)
# ls
.               copy_file2      copy_file5      copy_file8      newfile.txt
..              copy_file3      copy_file6      copy_file9
copy_file10}    copy_file4      copy_file7      copy_file{1
# mv copy_file3 copy_file6 copy_file5 .
# ls
.               copy_file2      copy_file5      copy_file8      newfile.txt
..              copy_file3      copy_file6      copy_file9
copy_file10}    copy_file4      copy_file7      copy_file{1
# cd ..
# ls
.               .mozilla        EX              VG              labs
..              .ph             LAB1            copydir         raw.h
.lastlogin      .profile        Lectures        demos
# cd LAB1/
# mv copy_file3.txt copy_file6.txt copy_file5.txt .
mv: Source file not found.  (copy_file3.txt)
mv: Source file not found.  (copy_file6.txt)
mv: Source file not found.  (copy_file5.txt)
# mv copy_file3 copy_file6 copy_file5 ..
# ls
.               copy_file10}    copy_file4      copy_file8      copy_file{1
..              copy_file2      copy_file7      copy_file9      newfile.txt
# cd ..
# ls
.               .mozilla        EX              VG              copy_file6      labs
..              .ph             LAB1            copy_file3      copydir         raw.h
.lastlogin      .profile        Lectures        copy_file5      demos
# _
```

```
# cd L
LAB1/       Lectures/
# cd LAB1/
# ls
.               copy_file10}    copy_file4      copy_file8      copy_file{1
..              copy_file2      copy_file7      copy_file9      newfile.txt
# rm -i copy_file2 copy_file4
rm: remove copy_file2? (y/N) y
rm: remove copy_file4? (y/N) y
# ls
.               copy_file10}    copy_file8      copy_file{1
..              copy_file7      copy_file9      newfile.txt
# chmod -w LAB1
LAB1: No such file or directory
# cd ..
# chmod -w LAB1
# cd L
LAB1/       Lectures/
# cd LAB1/
# rm -i copy_file8
rm: remove copy_file8? (y/N) y
# ls
.               copy_file10}    copy_file9      newfile.txt
..              copy_file7      copy_file{1
# cd ..
# chmod +w LAB1/
# _
```

10.

```
# echo "PATH: $PATH"
PATH: /sbin:/usr/sbin:/bin:/usr/bin:/usr/photon/bin:/usr/photon/appbuilder:/opt/X11R6/bin:/usr/X11
R6/bin:/usr/local/bin:/opt/bin:/opt/sbin:/usr/qnx650/host/qnx6/x86/usr/bin:/usr/qnx650/host/qnx6/x
86/usr/sbin:/usr/qnx650/host/qnx6/x86/sbin:/usr/qnx650/host/qnx6/x86/bin:/usr/qnx650/host/qnx6/x86
/usr/photon/appbuilder
# echo "LOGNAME: $LOGNAME"
LOGNAME: root
# echo "HOME: $HOME"
HOME: /root
# echo "HOSTNAME: $HOSTNAME"
HOSTNAME: localhost
# echo "PWD: $PWD"
PWD: /root
# echo "RANDOM: $RANDOM"
RANDOM: 22779
# sleep 5
# echo "RANDOM: $RANDOM"
RANDOM: 23382
# _
```

11.
```
# ls /bin
.                   du                  ln                  netmanager          stty
..                  dumpifs             login               on                  su
aps                 echo                logout              pax                 sync
asa                 ed                  ls                  pidin               true
cat                 elvis               mkdir               ps                  uesh
chgrp               esh                 mkefs               pwd                 umount
chmod               ex                  mketfs              rm                  uname
chown               false               mkifs               rundemo             uncompress
confstr             fesh                mkifsf_elf          script              vg
cp                  gunzip              mkifsf_openbios     sendnto             vi
cpio                gzip                mkifsf_srec         sh                  view
csplit              hostname            mkxfs               shutdown            waitfor
dd                  igawk               more                slay                who
df                  kill                mount               sloginfo            zcat
dispconf            ksh                 mv                  split
# echo $?
0
# ls /pin
ls: No such file or directory (/pin)
# echo $?
1
# _
```

12.
```
# ls /bin ¦ pr -3 -t > bin_list.txt
# ls /usr/bin >> bin_list.txt
# _
```

13.
```
ttyp0: sh

# ls /usr/bin/g* ¦ wc -l
       7
# ls /usr/bin/t?? ¦ wc -l
       5
# ls /usr/bin/g*
/usr/bin/gawk           /usr/bin/getconf        /usr/bin/gf_cursor      /usr/bin/grep
/usr/bin/get_hw_info    /usr/bin/gf-calib       /usr/bin/gfi-demo
# ls /usr/bin/t??
/usr/bin/tar    /usr/bin/tee    /usr/bin/tic    /usr/bin/top    /usr/bin/tty
# _
```

14.
```
ttyp0: sh

# cat /etc/passwd ¦ wc -l
      10
# cat /etc/group ¦ wc -l
      15
# cat /etc/passwd ¦ cut -d: -f1
root
bin
daemon
mail
news
uucp
ftp
sshd
nobody
user
# awk -F: '$2 == "" {print $1}' /etc/passwd
root
user
#
```
15. 15 групп
16. Root и user

17-23.
```
# chmod u-r newfile.txt
# cat newfile.txt

Hello world!
# chmod u+r newfile.txt
# chmod o-r newfile.txt
# su otheruser -c "cat newfile.txt"
# chmod u-w newfile.txt
# echo "new text" >> newfile.txt
# cat newfile.txt

Hello world!
new text
# chmod u+w newfile.txt
# chmod o-w newfile.txt
# su otheruser -c "echo 'test' >> newfile.txt"
#
# echo "chmod 755 or o+rx accept"
chmod 755 or o+rx accept
# echo "chmod 700 or o-rx close"
chmod 700 or o-rx close
# echo "chmod 555 or o=rx only read"
chmod 555 or o=rx only read
# echo "chmod o=--x $HOME for famous names"
chmod o=--x /root for famous names
#
```

Создание простых скриптов

2.1

```
# chmod +x script.sh
# ./script.sh a b c
Kol-vo parametrov: 3
Parametry: a b c
Parametr: a
Parametr: b
Parametr: c
# cat script.sh
#!/bin/sh
echo "Kol-vo parametrov: $#"
echo "Parametry: $@"
for param in "$@"; do
        echo "Parametr: $param"
done
# _
```

2.2

```
# chmod +x script2.sh
# ./script2.sh io-audio
./script2.sh[5]: [1: cannot execute - No such file or directory
   98318   1 sbin/io-audio       10o SIGWAITINFO
   98318   2 sbin/io-audio       10o RECEIVE     1
   98318   3 sbin/io-audio       10o RECEIVE     1
   98318   4 sbin/io-audio       10o RECEIVE     1
   98318   5 sbin/io-audio       50r INTR
   98318   6 sbin/io-audio       50r RECEIVE     7
# cat script2.sh
#!/bin/sh
if [$# -lt 1]; then
        echo "Process: $0"
        exit 1
fi
PROC="$1"
pidin | grep "$PROC"
# _
```

2.3

```
# cat script3.sh
#!/bin/sh
if [ $# -eq 0 ]; then
        echo "Name file"
        exit 1
fi

gcc -o ${1%.*} $1 2> eroors.txt

if [ $? -eq 0 ]; then
        ./${1%.*}
else
        vi eroors.txt
fi
# _
```

Разработка программ

3.1

```
# cat hello_center.c
#include <stdio.h>
#include <stdlib.h>

int main() {
        system("clear");
        printf("\033[12;40HHELLO\n");
        return 0;
}
# _
```

3.2

```
# cat key_codes.c
#include <stdio.h>
#include <termios.h>
#include <unistd.h>

int main() {
        struct termios old, new;
        tcgetattr(STDIN_FILENO, &old);
        new = old;
        new.c_lflag &= ~(ICANON | ECHO);
        tcsetattr(STDIN_FILENO, TCSANOW, &new);

        printf("Touch key (q for exit):\n");
        char c;
        while ((c = getchar()) != 'q') {
                printf("CODE : %d\n", c);
        }

        tcsetattr(STDIN_FILENO, TCSANOW, &old);
        return 0;
}
# _
```

3.3

3.4

```c
#include <stdio.h>
#include <signal.h>
#include <unistd.h>
#include <stdlib.h>

void suicide(int sig)
{
    printf("\033[?25h\033[=0G\033[=7F\n");
    exit(0);
}

void error_suicide()
{
    printf("\033[?25h\033[=0G\033[=7F\n");
    exit(-1);
}

int main(int argc, char *argv[])
{
    signal(SIGINT, suicide);
    if(argc != 4){
        printf("Too few arguments");
        error_suicide();
    }
    int speed = atoi(argv[1]);
    int direction = atoi(argv[2]);
    int color = atoi(argv[3]);

    if(direction < 1 || direction > 4) {
        printf("Invalid direction");
        error_suicide();
    }
    if(color < 0 || color > 7) {
        printf("Invalid color");
        error_suicide();
    }
    if(speed < 1) {
        printf("Invalid speed");
        error_suicide();
    }

    int dx = 0, dy = 0;
    if(direction == 1)
        dy = -1;
```

```
    if(direction == 2)
        dx = -1;
    if(direction == 3)
        dy = 1;
    if(direction == 4)
        dx = 1;

    printf("\033[=%df\033[?25l", color);
    int x, y;
    for(x = 40, y = 15; ; x += dx, y += dy)
    {
        printf("\033[2J");
        printf("\033[%d;%dH", y, x);
        printf("(*^^*)^");
        fflush(stdout);
        usleep(speed);
        if(y+dy < 0 || y+dy > 42)
            y = y - 42 * dy;
        if(x+dx < 0 || x+dx > 80)
            x = x - 80 * dx;
    }
    return 0;
}
# 
```

```c
#include <stdio.h>
#include <unistd.h>
#include <termios.h>

int main() {
        struct termios old, new;
        tcgetattr(STDIN_FILENO, &old);
        new = old;
        new.c_lflag &= ~(ICANON | ECHO);
        tcsetattr(STDIN_FILENO, TCSANOW, &new);

        printf("\033[?25l");

        int x = 1, y = 1;
        int dx = 1, dy = 1;

        while (1) {
                printf("\033[%d;%dH*", y, x);
                fflush(stdout);
                usleep(100000);
                printf("\033[%d;%dH ", y, x);

                x += dx;
                y += dy;

                if (x <= 1 || x >= 80) dx = -dx;
                if (y <= 1 || y >= 24) dy = -dy;
        }

        printf("\033[?25h");
        tcsetattr(STDIN_FILENO, TCSANOW, &old);
        return 0;
}
```