

# Lab1 实验报告

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## 实验要求

- MBR：从实模式切换到保护模式，加载游戏并执行；
- 游戏：实现一个(图像化)界面的、由键盘和时钟控制的小游戏，如黑白棋。

## 实验进度

所有要求已经实现，具体如下：

- 从实模式切换到保护模式
- 可以响应时钟和键盘中断
- 实现printk
- 实现了一个躲方块的游戏，完美运行。

Git log如下：

```
chango@Linux ~/Desktop/oslab/oslab/oslab $ git log
commit 67324e4acf013e63f689fc2934f722e2de9ae7ce
Author: 151220012-chango chen <changochen1@gmail.com>
Date: Mon Mar 20 20:58:29 2017 +0800

    Complete the game

commit 917233001d1eb5928f067840b60de20125c27b84
Author: 151220012-chango chen <changochen1@gmail.com>
Date: Sun Mar 19 01:15:45 2017 +0800

    Add a stupid game demo

commit 1f1d5da6137dffffed4c110346188292c2e276201
Author: 151220012-chango chen <changochen1@gmail.com>
Date: Tue Mar 14 21:34:03 2017 +0800

    Abandon JOS,use jiangos frame code instead.Add video output.
```

```
commit c5cbc406169f91540ee2df6272ad60fa156f50ed
Author: 151220012-chango chen <changochen1@gmail.com>
Date: Tue Mar 14 14:22:40 2017 +0800
```

add keyboard interrupt

```
commit 803adb9d76499643fcef89f4f206571ba75cbe18
Author: 151220012-chango chen <changochen1@gmail.com>
Date: Sun Mar 12 15:47:32 2017 +0800
```

fix some bugs

```
commit 78d2eccd59e99f3c1c3e070279576299f0368f52
Author: 151220012-chango chen <changochen1@gmail.com>
Date: Sun Mar 12 15:29:52 2017 +0800
```

add print

```
commit 85373358e8895ec430854cce821e9688dc4cbcd8
Author: 151220012-chango chen <changochen1@gmail.com>
Date: Wed Mar 8 13:40:35 2017 +0800
```

Successfully initialize the system and then jump to the entry of the game.

```
commit 5c780ef183c4210a5f7300cf6d5aa476357807fb
Author: 151220012-chango chen <changochen1@gmail.com>
Date: Mon Mar 6 21:45:28 2017 +0800
```

Finish the bootloader and jump to the trivial main function successfully

```
commit 09e2613b17810754a97257d753619584dc0d46b0
Author: 151220012-chango chen <changochen1@gmail.com>
Date: Mon Mar 6 21:03:44 2017 +0800
```

Try writing the mbr

```
commit 42c399e8706caee5ab0b50e0d0e52adadd99bd64
Author: 151220012-chango chen <changochen1@gmail.com>
Date: Fri Mar 3 11:24:46 2017 +0800
```

ready to go

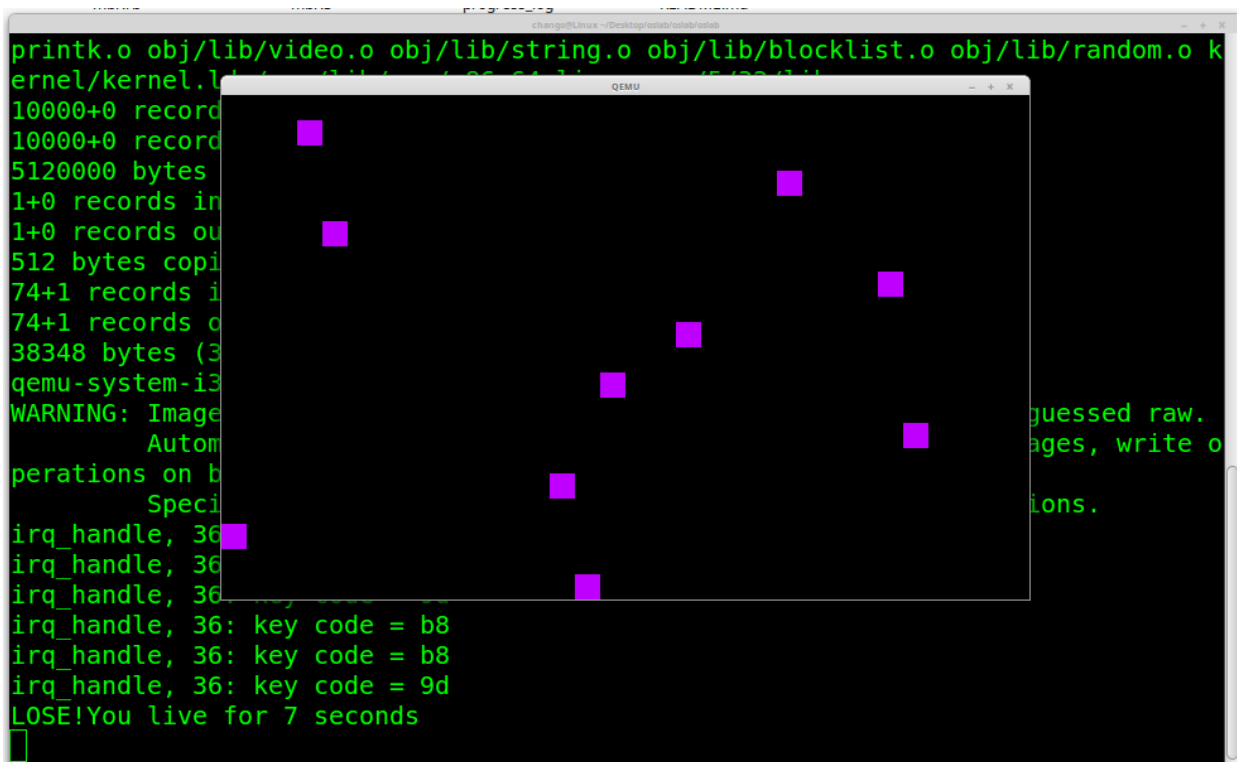
```
commit ca061729333ea809a8692055036731310844021f
Author: 151220012-chango chen <changochen1@gmail.com>
Date: Fri Mar 3 10:57:46 2017 +0800
```

test

```
commit 99f5c297fee76215e0543353056f4ef70da279e7
Author: Changochen <541528322@qq.com>
Date: Fri Mar 3 10:53:26 2017 +0800
```

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游戏说明:



敌人的方块随机从顶部下降，你要用ASDW控制自己的方块来躲开敌人的方块，存活时间越长，分数越高。

## 实验中遇到的问题及解决方案

1. 在参考讲义中的Makefile文件时，在Linuxmint 64位的系统上编译出现以下错误：

```
/home/chango/Desktop/oslab/oslab/oslab/lib/printk.c:115: undefined reference to
`__stack_chk_fail'
Makefile:77: recipe for target 'kernel.bin' failed
```

Solution: 在编译选项后加上：

```
18 CFLAGS += -ggdb3 #GDB调试信息
19 CFLAGS += -fno-stack-protector
20
```

2. 用数组管理方块效率太低，实现一个简单的链表来提高效率

```
4  typedef struct Node
5  {
6      int x;
7      int y;
8      struct Node *next,*prev;
9  }NODE;
10
11  NODE* get_head();
12  NODE* get_tail();
13  void init_list();
14
15  void add(int x,int y);
16
17  NODE* del(NODE* node);
```