Project 2

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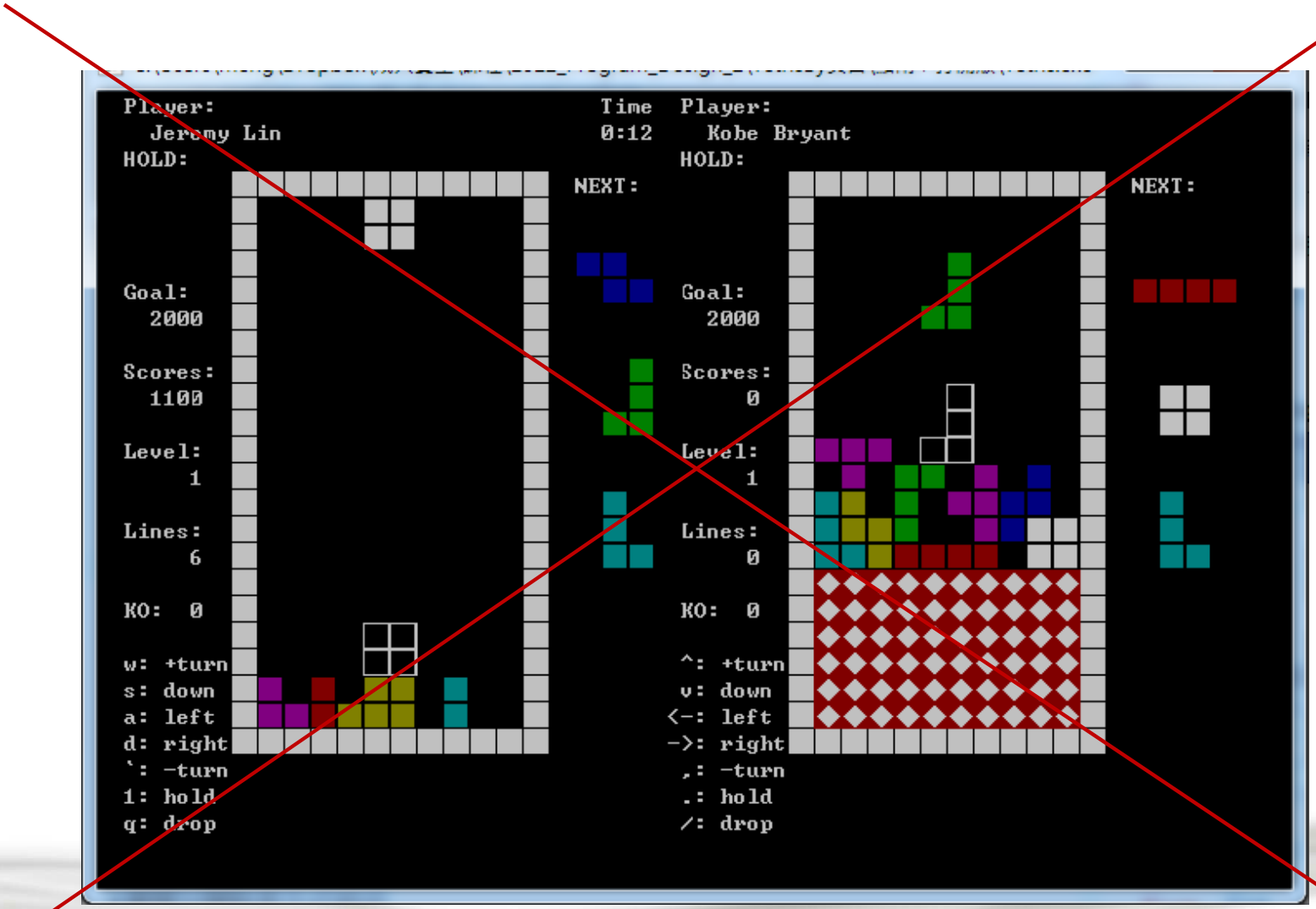
Tetris?


Player:
Jeremy Lin
HOLD:
Time
0:12
NEXT:
Goal:
2000
Scores:
1100
Level:
1
Lines:
6
KO: 0
w: +turn
s: down
a: left
d: right
`: -turn
1: hold
q: drop
Player:
Kobe Bryant
HOLD:
NEXT:
Goal:
2000
Scores:
0
Level:
1
Lines:
0
KO: 0
^: +turn
v: down
<-: left
->: right
,: -turn
.: hold
/: drop

No. It’s NS-Shaft

Source:http://img.miigii.com.tw/Files/News/20120606/e670d95150c54ce194922d294bc659e6.jpg

NS-Shaft

- NS-Shaft is a shareware computer game that was originally produced and released in 1996 by Nagi-P Software for the Macintosh.
- NS-Shaft is a platform game in which the player attempts to descend into a cave.
- There are two controls, which move the player to the left and the right.
- The platforms move up the screen at a slowly accelerating rate.

NS-Shaft (cont.)

- A ceiling of spikes hovers at the top of the screen.
- The goal is to fall from platform to platform rapidly enough to not be hit by the spikes, but slowly enough not to fall off the bottom of the screen.
- There are two ways to die: by hitting too many spikes and running out of health, or falling off the bottom of the screen.
- Hitting spikes (either on the ceiling, or on a platform) reduces the player's amount of health by five, while landing on an ordinary platform increases the player's health by one.

Types of Platforms

Static Platform

Spiked Platform (which deduct health points)

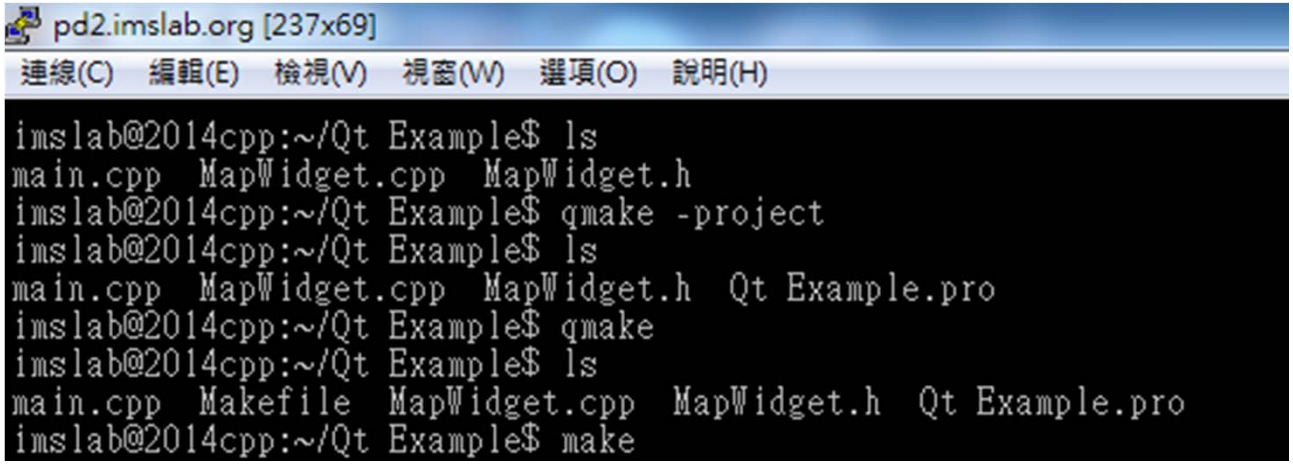
One-time Platform (which crumbles as soon as the player land on it)

Left-rotating Conveyor (which pushes the player to the left)

Right-rotating Conveyor (which pushes the player to the right)

Spring (the player bounces off)

Qt Tutorial


pd2.imslab.org [237x69]
連線(C) 編輯(E) 檢視(V) 視窗(W) 選項(O) 說明(H)
imslab@2014cpp:~/Qt Example$ ls
main.cpp MapWidget.cpp MapWidget.h
imslab@2014cpp:~/Qt Example$ qmake -project
imslab@2014cpp:~/Qt Example$ ls
main.cpp MapWidget.cpp MapWidget.h Qt Example.pro
imslab@2014cpp:~/Qt Example$ qmake
imslab@2014cpp:~/Qt Example$ ls
main.cpp Makefile MapWidget.cpp MapWidget.h Qt Example.pro
imslab@2014cpp:~/Qt Example$ make

Qt Tutorial (cont.)

pd2.imslab.org [167x42]

連線(C) 編輯(E) 檢視(V) 視窗(W) 選項(O) 說明(H)

```
 2 #include <QWidget>
 3
 4 #include "MapWidget.h"
 5
 6 int main(int argc, char *argv[]){
 7
 8     QApplication app(argc, argv);
 9     MapWidget *mapWidget = new MapWidget();
10     mapWidget->setWindowTitle("Main");
11     mapWidget->resize(400, 500);
12
13     mapWidget->show();
14     return app.exec();
15 }
```

pd2.imslab.org [237x69]

連線(C) 編輯(E) 檢視(V) 視窗(W) 選項(O) 說明(H)

```
 1 #include <QWidget>
 2 #include <QPainter>
 3 #include <QKeyEvent>
 4 #include <QTimer>
 5
 6
 7
 8 class MapWidget : public QWidget{
 9     public:
10         MapWidget(QWidget* parent = 0);
11
12     protected:
13         void paintEvent(QPaintEvent *);
14         virtual void keyPressEvent(QKeyEvent *event);
15
16     private:
17         int x;
18         int y;
19 };
```

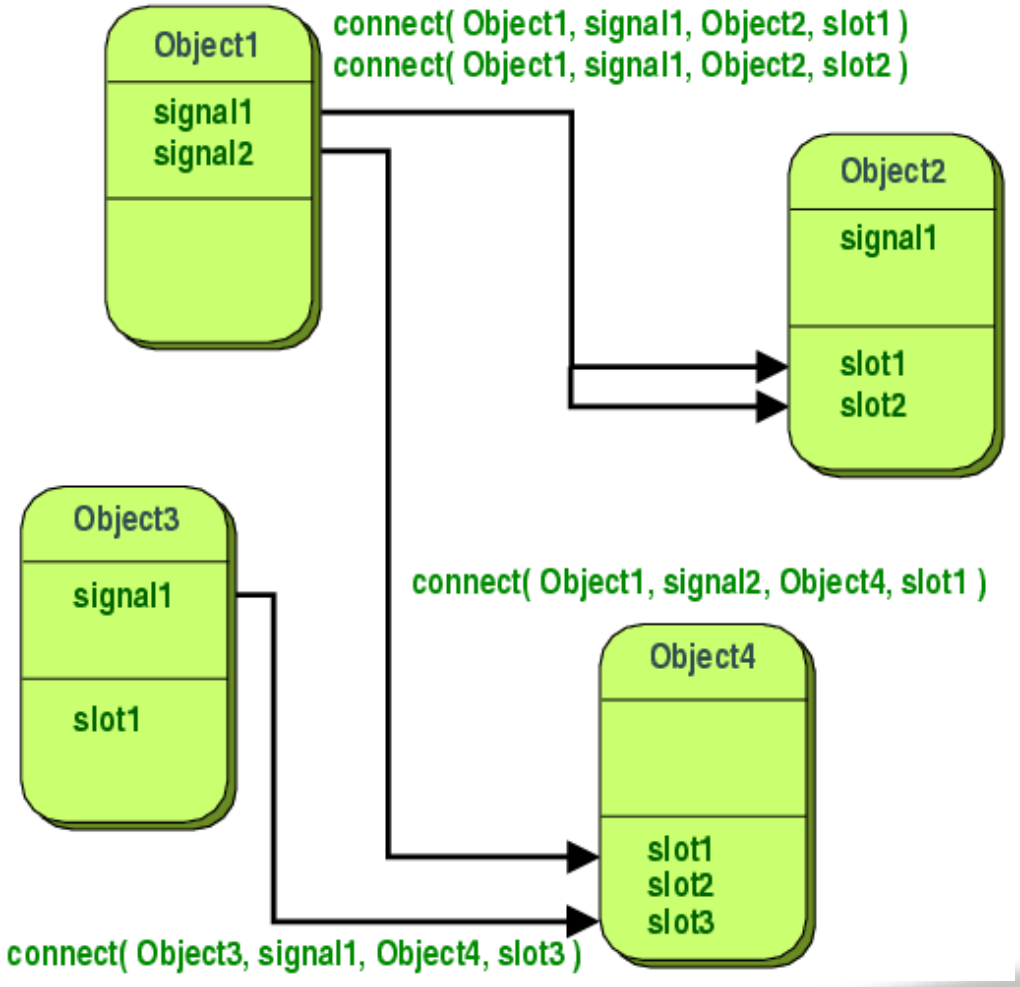
Qt Tutorial (cont.)

pd2.imslab.org [167x42]

連線(C) 編輯(E) 檢視(V) 視窗(W) 選項(O) 說明(H)

```
1  #include "MapWidget.h"
2
3  MapWidget::MapWidget(QWidget* parent): QWidget(parent)
4  {
5      x = 0;
6      y = 10;
7      QTimer *timer = new QTimer(this);
8      connect(timer, SIGNAL(timeout()), this, SLOT(update()));
9      timer->start(100);
10 }
11
12 void MapWidget::paintEvent(QPaintEvent *event){
13     QPainter painter(this);
14     if(y > 400) y = 0;
15     painter.drawRect(x, y++, 10, 10);
16 }
17
18 void MapWidget::keyPressEvent(QKeyEvent *event)
19 {
20     if(event->type() == QEvent::KeyPress){
21         switch (event->key()){
22             case Qt::Key_Left:
23                 x--;
24                 break;
25             case Qt::Key_Right:
26                 x++;
27                 break;
28             case Qt::Key_Up:
29                 y--;
30                 break;
31             case Qt::Key_Down:
32                 y++;
33                 break;
34         }
35     }
36 }
```

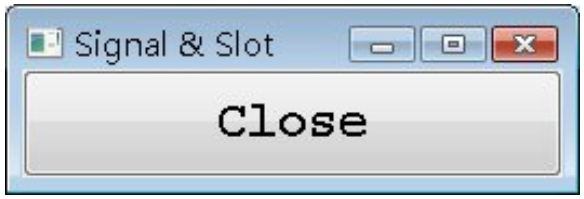
Qt Tutorial (cont.)



（圖片取自Qt官方的 Signals and Slots 文件）

Qt Tutorial (cont.)

```
#include <QApplication>
#include <QPushButton>
#include <QFont>

int main(int argc, char *argv[])
{
    QApplication app(argc, argv);

    QPushButton *btn = new QPushButton("Close");
    btn->setWindowTitle("Signal & Slot");
    btn->setFont(QFont("Courier", 18, QFont::Bold));
    btn->resize(250, 50);

    QObject::connect(btn, SIGNAL(clicked()), &app, SLOT(quit()));

    btn->show();

    return app.exec();
}
```



Requirements

- Develop an interactive NS-Shaft game
- Use polymorphism to design your platforms
- Use operator overloading for operations
- Use new / delete to dynamically allocate / release your platform objects
- Draw UML class diagram in your report

Requirements (cont.)

1. Use GUI library (Qt4 by default)
2. Basically the same functionality with the original NS-Shaft game (Scores are deducted for incompleteness)
3. Display number of elapsed platforms
4. Display current health point (HP)
5. Implement all types of platforms.
6. Falling speed increases along with time.

作業要求

- 使用圖型化介面完成此遊戲 (預設函式庫: Qt4)
- 使用多型/繼承在階梯上面
- 使用至少一種Operator Overloading
- 使用 new/delete 來動態的產生或釋放階梯Object
- 在Report中畫出UML
- 完整的遊戲 (遊戲不完整會斟酌扣分)
- 顯示已經往下的階梯數
- 顯示目前血量
- 完成所有種類階梯
- 往下掉的速度隨時間變快

Developing Environment

1. Windows
   - You may install Qt4 library for your favorite IDE, or
   - Install VirtualBox, download and load ubuntu Linux image prepared by TA, where necessary tools/libraries are already installed.
2. Linux/FreeBSD/Solaris
   - Make sure that X Window is installed in your OS.
   - Install Qt4 library on your own.

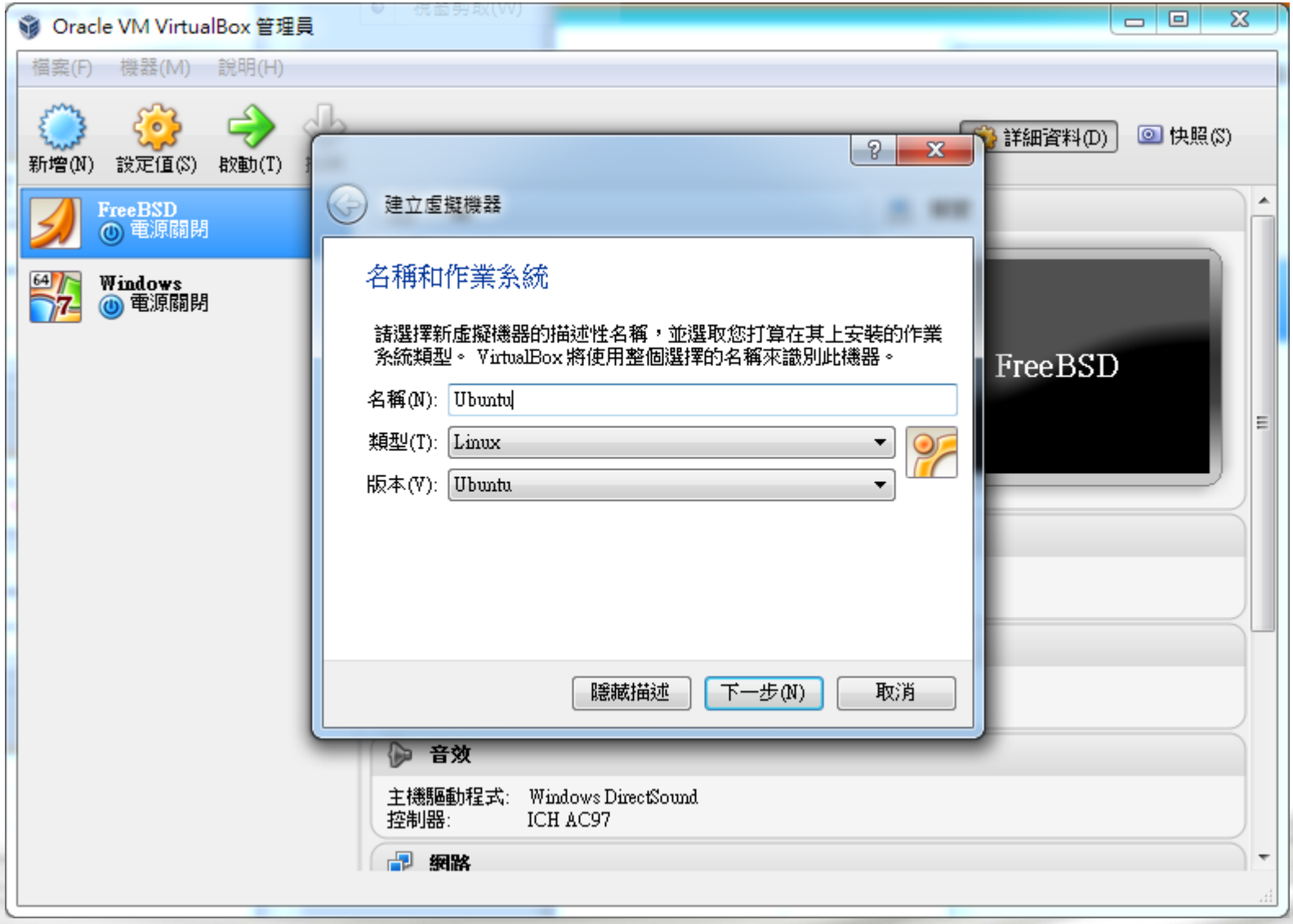
Evaluation

- Demo Date: 6/23 ~ 6/27, By Appointment
- Demo Room: TBA
- You should upload your source code and report before 6/22 11:00pm.
- Grading Policy
  - Report (1 ~ 5 pages) 10%
  - Demo to TA 40%
  - On-site modification 50%
  - Bonus up to 20%

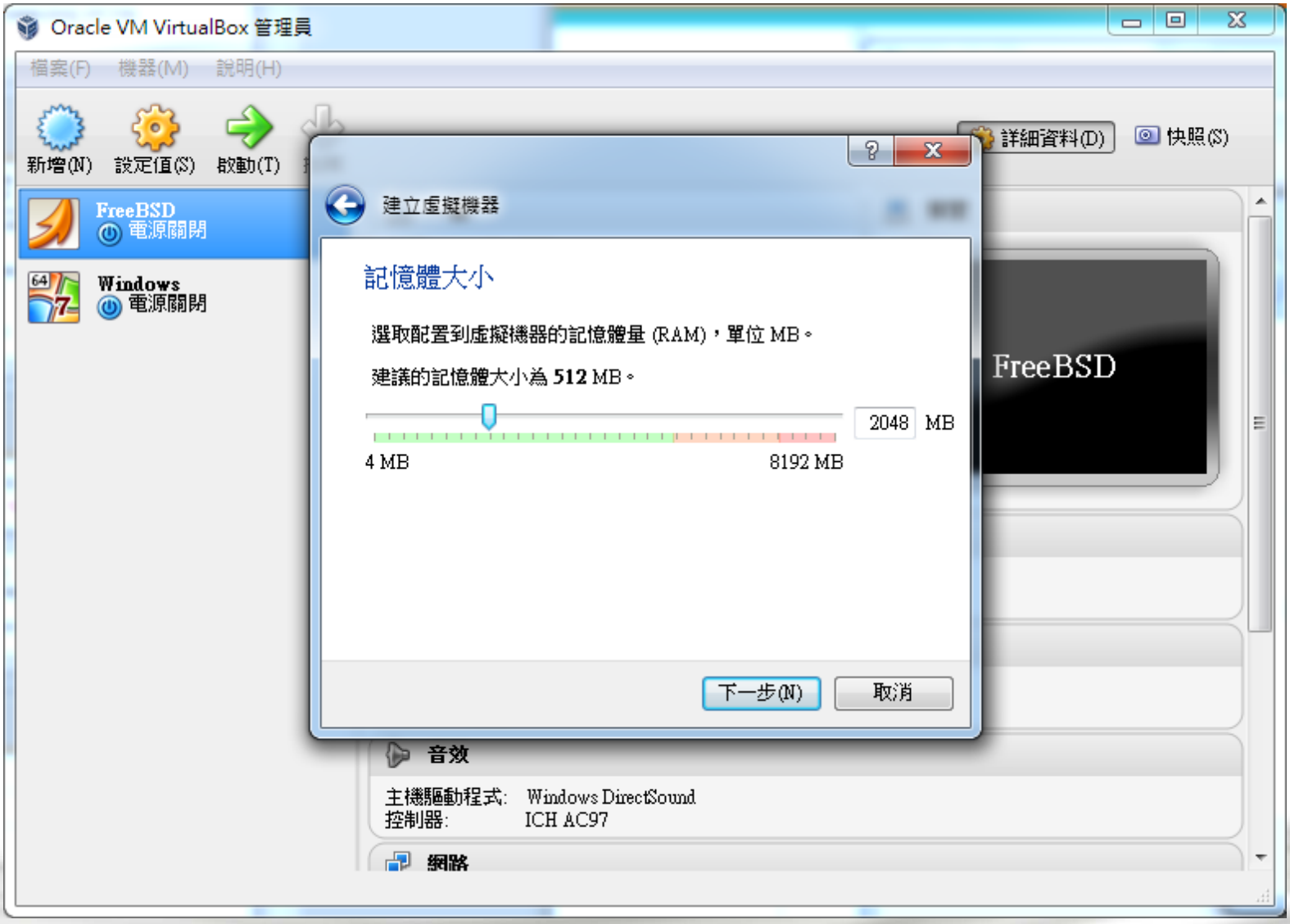
Reference

- Qt Tutorial
  http://openhome.cc/Gossip/Qt4Gossip/
- Qt all classes
  http://qt-project.org/doc/qt-4.8/classes.html

Load VirtualBox Image



Load VirtualBox Image (cont.)



Load VirtualBox Image (cont.)

- Download image of the ubuntu Linux from http://pd2a.imslab.org/ubuntu.rar