**ＯＳ專案書面報告**

**資科三**

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負責JAVA multithread程式設計 以及實作影片錄製

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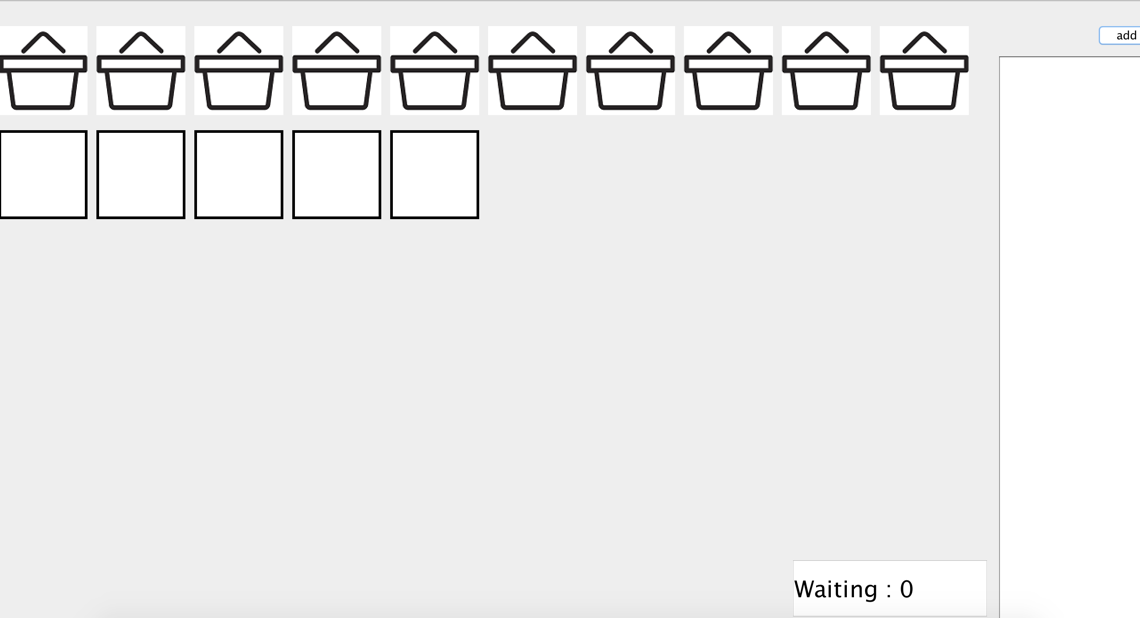
負責JAVA Deadlock程式設計 以及ＧＵＩ界面

**題目：swimming pool:**

程式設計語言選擇：JAVA IDE : Eclipse

使用ＪＡＶＡ多直行續 實作出Swimming Pool

ＧＵＩ介面：



**ＧＵＩ界面以及程式流程介紹：**

Swimming Pool Problem

上排為籃子 10個 若有人使用 籃子則會上色

下排為房間數 5個 若有人使用 該方格則會打一個Ｘ

人潮過多時 則會 輸出該人物找不到房間

直到房間空出後再進入找房間

右下角 waiting 人數：若人潮過多 籃子不夠用了！！

（防止Deadlock產生）

最右邊 console欄 顯示客人在該泳池俱樂部的流程

最右上角 add 為ＩＮＰＵＴ鈕

每按一次 多來一個客人

**實作影片連結網址：**

<https://youtu.be/6H9BprYXviQ>

**程式：**

**Demo.java:**

**import** java.util.\*;

**public** **class** Demo {

**public** **static** **int**[] *cubicle* = **new** **int**[5];

Shared variables

**public** **static** **int**[] *basket* = **new** **int**[10];

**public** **static** **int** *number*;

**public** **static** **int** *basket\_num*;

**public** **static** LinkedList<InThread> *inThreadList*;

**public** Demo(){

*start*();

}

**public** **static** **void** start() {

*number* = 0;

*basket\_num* = 0;

*inThreadList* = **null**;

}

**public** **static** **void** add(){

*number*++;

InThread inThread = **new** InThread(*number*);

inThread.start();

}

**public** **static** **void** printInf() {

System.***out***.println("淋浴間:");

**for**(**int** b:*cubicle*) {

System.***out***.print(b + " ");

}

System.***out***.println();

System.***out***.println("籃子:");

**for**(**int** b:*basket*) {

System.***out***.print(b + " ");

}

System.***out***.println();

}

}

**Inthread.java**

**public** **class** InThread **extends** Thread {

**private** **int** number;

**private** **int** situ;

**private** **int** temp;

**public** InThread(**int** num) {

number = num;

situ = 0;

}

**static** **private** Object *obj* = **new** Object();

**public** **static** **void** staticWait() {

**synchronized** (*obj*) {

**try** {

*obj*.wait();

} **catch** (Exception e) {}

}

}

**public** **static** **void** staticNotify() {

**synchronized** (*obj*) {

*obj*.notify();

}

}

**public** **static** **void** leave(){

Demo.*basket\_num*--;

*staticNotify*();

}

**public** **void** run () {

**if**(Demo.*basket\_num* > 9){

GUItest.*textField*.setText("Waiting : " + ++GUItest.*waiting\_num*);

}

**while**(Demo.*basket\_num* > 9){

*staticWait*();

}

**if**(GUItest.*waiting\_num* > 0){

GUItest.*textField*.setText("Waiting : " + --GUItest.*waiting\_num*);

}

Critical Section

Demo.*basket\_num*++;

**while**(situ<5) {

**switch**(situ) {

**case** 0:{

System.***out***.println(number + "找房間中");

GUItest.*ta*.append(number + "找房間中" + "\r\n");

**for**(**int** i=0; i<5; i++) {

**if**(Demo.*cubicle*[i] == 0) {

Demo.*cubicle*[i] = number;

temp = i;

situ++;

GUItest.*cubicle\_change*(i, **true**);

**break**;

}

**if**(i==4){

System.***out***.println(number + "找不到房間");

GUItest.*ta*.append(number + "找不到房間" + "\r\n");

}

}

**break**;

}

**case** 1:{

System.***out***.println(number + "找籃子中");

GUItest.*ta*.append(number + "找籃子中" + "\r\n");

**for**(**int** i=0; i<10; i++) {

**if**(Demo.*basket*[i] == 0) {

Demo.*basket*[i] = number;

situ++;

GUItest.*basket\_change*(i, **true**);

**break**;

}

**if**(i==9){

System.***out***.println(number + "找不到籃子");

GUItest.*ta*.append(number + "找不到籃子" + "\r\n");

}

}

**break**;

}

**case** 2:{

**for**(**int** i=0; i<5; i++) {

**if**(Demo.*cubicle*[i] == number) {

Demo.*cubicle*[i] = 0;

GUItest.*cubicle\_change*(i, **false**);

}

}

System.***out***.println(number + "游泳中");

GUItest.*ta*.append(number + "游泳中" + "\r\n");

situ++;

**break**;

}

**case** 3:{

System.***out***.println(number + "找房間回家");

GUItest.*ta*.append(number + "找房間回家" + "\r\n");

**for**(**int** i=0; i<5; i++) {

**if**(Demo.*cubicle*[i] == 0) {

Demo.*cubicle*[i] = number;

temp = i;

situ++;

GUItest.*cubicle\_change*(i, **true**);

**break**;

}

**if**(i==4){

System.***out***.println(number + "找不到房間回家");

GUItest.*ta*.append(number + "找不到房間回家" + "\r\n");

}

}

**break**;

}

**case** 4:{

System.***out***.println(number + "回家囉");

GUItest.*ta*.append(number + "回家囉" + "\r\n");

**for**(**int** i=0; i<10; i++) {

**if**(Demo.*basket*[i] == number) {

Demo.*basket*[i] = 0;

GUItest.*basket\_change*(i, **false**);

Demo.*cubicle*[temp] = 0;

GUItest.*cubicle\_change*(temp, **false**);

*leave*();

}

}

situ++;

**break**;

}

}

**try** {

Thread.*currentThread*().*sleep*(3000);

}

**catch**(InterruptedException e) {

e.printStackTrace();

}

}

}

}

Notify()

離開更衣間

清空籃子

換衣服

找更衣間

離開泳池

游泳

離開更衣間

找更衣間

裝進籃子

換衣服

沒有

Wait()

先詢問是否有籃子

進入泳池