**UML :**

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| **MainWindow : public QMainWindow, public b2ContactListener** |
| + Q\_OBJECT  - ui : Ui::MainWindow \*  - scene : QGraphicsScene \*  - world : b2World \*  - itemList QList<GameItem \*>  - timer : QTimer  - bird[5] : Bird \*  - currentBird : Bird \*  - slingshot : Slingshot \*  - mousePress : bool  - birdAttacking : bool  - destroying : bool  - theEnd : bool  - mouseX : float  - mouseY : float  - mouseToReady : float  - birdCount : int  - score : int  - numOfPig : int |
| + MainWindow(QWidget \*)  + ~MainWindow()  + *showEvent*(QShowEvent \*) : void  + *eventFilter*(QObject \*,QEvent \*) : bool  + *closeEvent*(QCloseEvent \*) : void  + restart() : void  s quitGame() : void  - tick() : void  - QUITSLOT() : void  - xPixToMet(int) : float  - yPixToMet(int) : float  - distance(float,float,float,float) : float  - velocity(b2Vec2) : float  - *BeginContact*(b2Contact \*) : void  - *EndContact*(b2Contact \*) : void |

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| **GameItem : public QObject** |
| + Q\_OBJECT  + canDie : bool  # g\_body : b2Body \*  # g\_pixmap : QGraphicsPixmapItem;  # g\_size : QSizeF;  # g\_world : b2World \*  # g\_worldsize : static QSizeF  # g\_windowsize : static QSizeF  # hitPoint : float  # name : QString |
| + GameItem(b2World \*)  + ~*GameItem*()  + setGlobalSize(QSizeF, QSizeF) : static void  + setHitPoint(float) : void  + getBody() : b2Body \*  + getHitPoint() : float  + getName() : QString  + paint() : void  + *collide*(float) : virtual void |

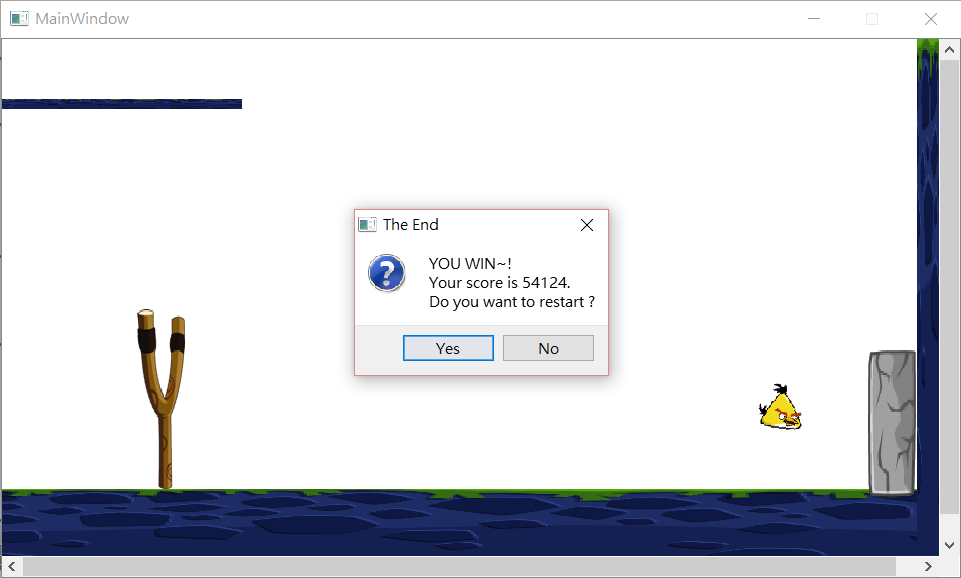
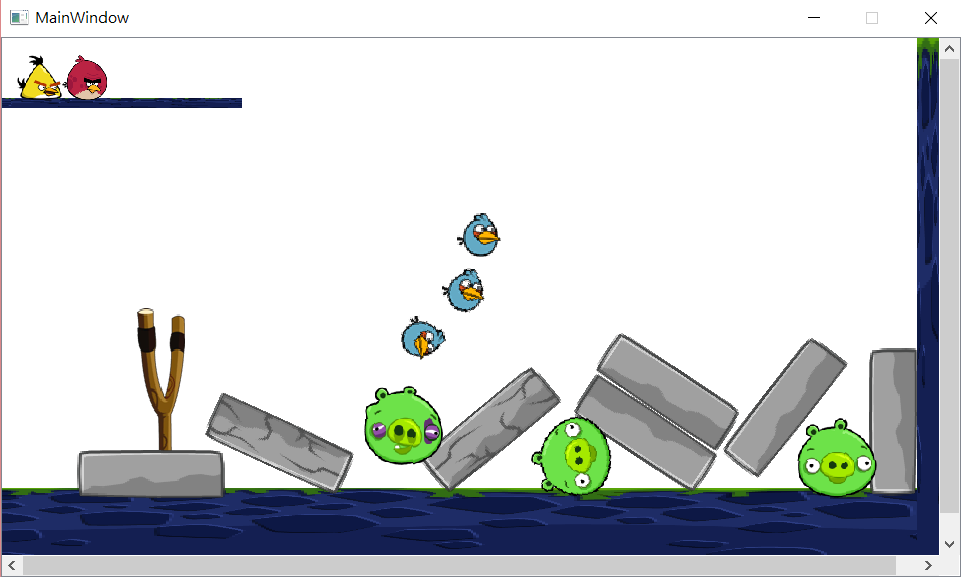
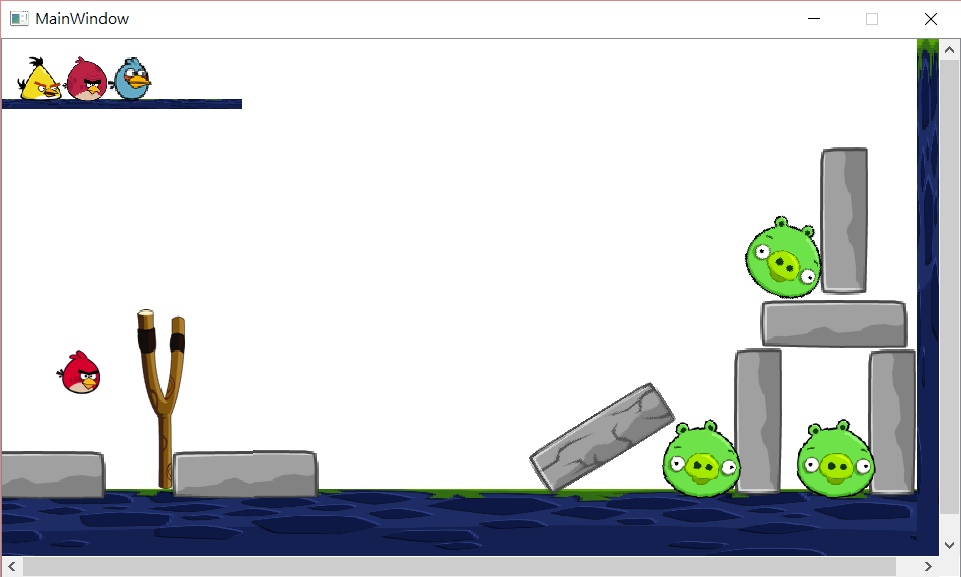
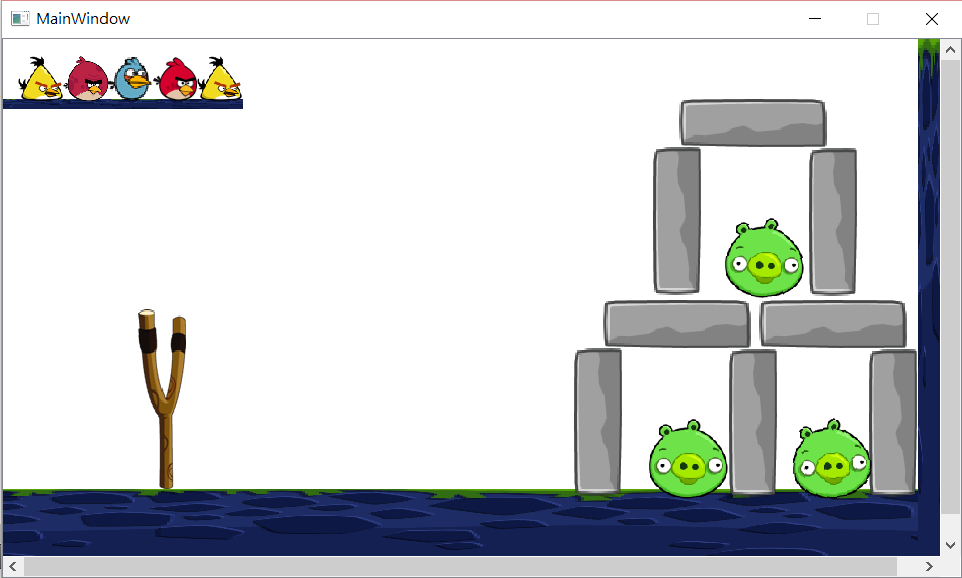
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| **Bird : public GameItem** |
| - type : int  - skillValid : bool |
| + Bird(float, float, float, int, QTimer \*, QPixmap,  b2World \*, QGraphicsScene \*)  + setLinearVelocity(b2Vec2) : void  + setTransform(b2Vec2, float) : void  + getX() : float  + getY() : float  + getType() : int  + getSkillValid() : bool  + getLinearVelocity() : b2Vec2  + useSkill() : void  + *collide*(float velocity) : void |

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| **Block : public GameItem** |
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| + Block(float, float, float, float, QTimer \*,  QPixmap, b2World \*, QGraphicsScene \*)  + SetTransform(b2Vec2, float) : void  + *collide*(float) : void |

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| **Land : public GameItem** |
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| + Land(float, float, float, float, QPixmap, b2World \*,  QGraphicsScene \*)  + *collide*(float) : void |

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| **Pig : public GameItem** |
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| + Pig(float, float, float, QTimer \*, QPixmap, b2World \*,  QGraphicsScene \*)  + setLinearVelocity(b2Vec2) : void  + setTransform(b2Vec2, float) : void  + getX() : float  + getY() : float  + *collide*(float velocity) : void |

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| **Slingshot : public GameItem** |
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| + Land(float, float, float, float, QPixmap, b2World \*,  QGraphicsScene \*)  + *collide*(float) : void |

**Screen Shot : **

**How To Play :**

**1. Use birds and the slingshot to attack pigs.**

**2. Press to use the bird's skill during the bird attacking.**

**3. Yellow birds can dash and biue bird's can use split body technique.**

**4. Old birds are heavier then the other birds.**

**5. Break a rock will get 3000 points.**

**6. Kill a pig will get 8000 points.**

**7. One more remainder bird get 10000 points.**

**8. Kill all the pigs to win the game.**

**Program Architecture :**

**利用BOX2D 作為物理引擎，以一個virtual的class GameItem 作為遊戲物件的base，然後建立Bird, Block, Land, Pig, Slingshot，並override GameItem中 virtual的 collide()，做為不同物體碰撞的反應。**

**於 MainWindow中建立一個world，並架設好關卡，以一個QList itemList紀錄 world中的物件，方便移除時使用。MainWindow 繼承b2ContactListener，接收碰撞的訊號，並做出相對應的反應。**

**Pig跟Block都有一個hitPoint，在碰撞中會逐漸減少，歸零時，MainWindow會將此物件移出world。**

**遊戲結束時，跳出MessageBox。**

**離開遊戲時，傳送quitGame()訊號。**