Subject: Help with a possible design problem?
Posted by snap2000 on Fri, 02 Feb 2007 21:43:59 GMT
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I'm trying to create a pong game that I will later add some power-ups to (affecting ball speed and paddle size). I've been making nice progress, however, I've hit a problem that I can't seem to get past. I've separated my game into the classes Ball, Player, and Pong (the main application). In my member function Ball::Update(), I'm trying to obtain the positions of my paddles (I planned on using player.GetRect()/computer.GetRect()), but the paddles are instanciated in my Pong class. I've tried making making them friend classes with public member variables and all types of crazy other things, but I can't seem to access player or computer from my Ball::Update function.

Is this simply a terrible design flaw (does anyone have a better idea), or is there some solution that I'm just missing? Thanks for your time if you decide to try and help. Here is my code so far (you may have to paste into editor to see it all, it's wide):

```
#include <CtrlLib/CtrlLib.h>

#define SCREENWIDTH  600
#define SCREENHEIGHT 480

#define PADDLEWIDTH  12
#define PADDLEHEIGHT 40

#define BALLSIZE  8
#define BALLSPEED 5

enum Which { PLAYER, COMPUTER };

class Ball {
private:
 int bx;
 float by;          // Ball pos
 int sx;
 float sy;          // Ball speed
 int size;          // Ball size
 Point* samples;          // Vector samples for collision detection
 int numSamples;          // Number of samples to be taken
 int serve;          // Who the ball is being served to
public:
 Ball()   { serve = -1; Reset(); }
 Rect GetRect() { Rect r(int(bx), int(by), int(bx + size), int(by + size)); return r; }
 void Update();
 void GetVectorSamples();
 void Reset();
};

void Ball::Reset() {
```

```
 size = BALLSIZE;          // Init ball size
 bx = (SCREENWIDTH - size) / 2;       // center ball horizontally
 by = (SCREENHEIGHT - size) / 2;       // center ball vertically
 sx = BALLSPEED * serve;         // Init ball x-speed
 sy = 0; //TODO: Pick random angle      // Init ball y-speed (angle)
}

void Ball::GetVectorSamples() {
 numSamples = (sx > size) ? sx / size : 1;    // Number of samples to take
 float dy = sy / numSamples;        // Slope of ball movement
 samples = new Point[numSamples];
 for(int s = 1; s <= numSamples; s++) {
  samples[s - 1].x = bx + (s * size);     // Calculate sample x-pos
  samples[s - 1].y = int(by + (s * dy));    // Calculate sample y-pos
 }
}

void Ball::Update() {
 if(bx + sx > SCREENWIDTH) {        // Ball exits to right of screen
  // TODO: add score and re-serve ball
  serve = -1;
  Reset();
 } else if(bx + size + sx < 0) {       // Ball exits to left of screen
  // TODO: add score and re-serve ball
  serve = 1;
  Reset();
 } else {           // Ball is still in play
  GetVectorSamples();
  // [[ HOW DO I GET ACCESS TO PADDLE? player/computer are in Pong class ]]
  // TODO: Test each sample against nearest paddle for collision
  // TODO: Correct angle and direction of ball if collided
  // TODO: Else continue in direction:
  bx += sx;
  by += sy;
 }
}

class Player {
private:
 int score, px, py, height;
 Which who;
public:
 Player()  { }
 Player(Which w);
 int GetScore()  { return score; }
 Rect GetRect() { Rect r(px, py, px + PADDLEWIDTH, py + height); return r; }
 void Update();
};
```

```
Player::Player(Which w) {
 score = 0;           // Init score
 py = (SCREENHEIGHT - PADDLEHEIGHT) / 2;     // Init paddle y-pos
 height = PADDLEHEIGHT;         // Init paddle height
 px = (w == PLAYER)
  ? 10           // Set player paddle x-pos
  : SCREENWIDTH - PADDLEWIDTH - 10;     // Set computer paddle x-pos
}

void Player::Update() {
 switch(who) {
  case PLAYER:
   // TODO: Get mouse y pos
   break;
  case COMPUTER:
   // TODO: Move computer paddle toward ball
   break;
 }
}

class Pong : public TopWindow {
public:
 void Paint(Draw& w);
private:
 Player player, computer;
 Ball ball;
public:
 typedef Pong CLASSNAME;
 Pong();
 void Update();
};

void Pong::Update() {
 // player.Update();          // Update player paddle position
 // computer.Update();         // Update computer paddle position
 ball.Update();           // Update ball position
 Refresh();
}

void Pong::Paint(Draw& w) {
 w.DrawRect(GetSize(), SBlack);
 w.DrawRect(player.GetRect(), SWhite);
 w.DrawRect(computer.GetRect(), SWhite);
 w.DrawRect(ball.GetRect(), SWhite);
 /* For showing projected samples ( samples and numSamples need to be made public to work )
 for(int i = 0; i < ball.numSamples; i++) {
  //w.DrawText(SCREENWIDTH / 2, 10 + 10 * i, ball.samples[i].ToString(), StdFont(), SWhite);
```

```
  w.DrawRect(ball.samples[i].x, ball.samples[i].y, BALLSIZE, BALLSIZE, SWhite);
 }
 */
}

Pong::Pong() {
 Title("Snap.Pong");
 SetRect(0, 0, SCREENWIDTH, SCREENHEIGHT);
 MinimizeBox();

 player = Player(PLAYER);        // Init player
 computer = Player(COMPUTER);       // Init computer

 BackPaint();
 Update();
 SetTimeCallback(-25, THISBACK(Update));
}

GUI_APP_MAIN
{
 Pong().Run();
}
```

Subject: Re: Help with a possible design problem?
Posted by mirek on Fri, 02 Feb 2007 22:00:26 GMT
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I think you will have to store a pointers in Ball to both paddles.

Mirek

Subject: Re: Help with a possible design problem?
Posted by snap2000 on Fri, 02 Feb 2007 23:01:18 GMT
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So, basically pass it to the Ball constructor? That seems simple enough.

But what about larger projects? Will I have to do this all the time? That could get messy.

For now, though. This seems like a great solution for such a simple and isolated problem, thanks.

Subject: Re: Help with a possible design problem?
Posted by snap2000 on Sat, 03 Feb 2007 00:04:52 GMT
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I tried implementing the changes, but I'm getting a few compiler errors with this particular code:

```
#include <CtrlLib/CtrlLib.h>

#define SCREENWIDTH  600
#define SCREENHEIGHT 480

#define PADDLEWIDTH  12
#define PADDLEHEIGHT 40

#define BALLSIZE  8
#define BALLSPEED 5

enum Which { PLAYER, COMPUTER };
class Ball;
class Player;
class Pong;

class Ball {
private:
 int bx;
 float by;           // Ball pos
 int sx;
 float sy;           // Ball speed
 int size;           // Ball size
 Point *samples;          // Vector samples for collision detection
 int numSamples;          // Number of samples to be taken
 int serve;           // Who the ball is being served to
 bool paused;          // If game is paused

 Player *player, *computer;        // Paddles
public:
 Ball()    { serve = -1; Reset(); }
 Rect GetRect()  { Rect r(int(bx), int(by), int(bx + size), int(by + size)); return r; }
 void Update();          // Update ball position
 void CalculateVectorSamples();       // Calculate collision sample points
 void Reset();          // Reset ball pos/attrs
 void SetPaddles(Player *p, Player *c);     // Set pointers to paddles
 void Pause(bool p = true) { paused = p; }    // Pause/unpause the game
 bool IsPaused()  { return paused; }     // Return if paused or not;
};

void Ball::SetPaddles(Player *p, Player *c) {
 player = p;
 computer = c;
```

```
}

void Ball::Reset() {
 size = BALLSIZE;          // Init ball size
 bx = (SCREENWIDTH - size) / 2;       // center ball horizontally
 by = (SCREENHEIGHT - size) / 2;       // center ball vertically
 sx = BALLSPEED * serve;         // Init ball x-speed
 sy = 0; //TODO: Pick random angle      // Init ball y-speed (angle)
}

void Ball::CalculateVectorSamples() {
 numSamples = (sx > size) ? sx / size : 1;    // Number of samples to take
 float dy = sy / numSamples;        // Slope of ball movement
 samples = new Point[numSamples];
 for(int s = 1; s <= numSamples; s++) {
  samples[s - 1].x = bx + (s * size);     // Calculate sample x-pos
  samples[s - 1].y = int(by + (s * dy));    // Calculate sample y-pos
 }
}

void Ball::Update() {
 if(IsPaused()) {
  return;
 } else if(bx + sx > SCREENWIDTH) {        // Ball exits to right of screen
  // TODO: add score and re-serve ball
  serve = -1;
  Reset();
 } else if(bx + size + sx < 0) {       // Ball exits to left of screen
  // TODO: add score and re-serve ball
  serve = 1;
  Reset();
 } else {           // Ball is still in play
  CalculateVectorSamples();
  PromptOK(AsString(player->GetScore()));
  Pause();
  // [[ HOW DO I GET ACCESS TO PADDLE? player/computer are in Pong class ]]
  // TODO: Test each sample against nearest paddle for collision
  // TODO: Correct angle and direction of ball if collided
  // TODO: Else continue in direction:
  bx += sx;
  by += sy;
 }
}

class Player {
private:
 int score, px, py, height;
 Which who;
```

```
 Ball *ball;
public:
 Player()    { }
 Player(Which w, Ball *b);
 int GetScore()    { return score; }
 Rect GetRect()   { Rect r(px, py, px + PADDLEWIDTH, py + height); return r; }
 void Update();
};

Player::Player(Which w, Ball *b) {
 ball = b;
 score = 0;           // Init score
 py = (SCREENHEIGHT - PADDLEHEIGHT) / 2;     // Init paddle y-pos
 height = PADDLEHEIGHT;         // Init paddle height
 px = (w == PLAYER)
  ? 10           // Set player paddle x-pos
  : SCREENWIDTH - PADDLEWIDTH - 10;     // Set computer paddle x-pos
}

void Player::Update() {
 if(ball->IsPaused())
  return;
 switch(who) {
  case PLAYER:
   // TODO: Get mouse y pos
   break;
  case COMPUTER:
   // TODO: Move computer paddle toward ball
   break;
 }
}

class Pong : public TopWindow {
public:
 void Paint(Draw& w);
private:
 Player player, computer;
 Ball ball;
public:
 typedef Pong CLASSNAME;
 Pong();
 void Update();
};

void Pong::Update() {
 // player.Update();          // Update player paddle position
 // computer.Update();        // Update computer paddle position
 ball.Update();           // Update ball position
```

```
 Refresh();
}

void Pong::Paint(Draw& w) {
 w.DrawRect(GetSize(), SBlack);
 w.DrawRect(player.GetRect(), SWhite);
 w.DrawRect(computer.GetRect(), SWhite);
 w.DrawRect(ball.GetRect(), SWhite);
 /* For showing projected samples ( samples and numSamples need to be made public to work )
 for(int i = 0; i < ball.numSamples; i++) {
  //w.DrawText(SCREENWIDTH / 2, 10 + 10 * i, ball.samples[i].ToString(), StdFont(), SWhite);
  w.DrawRect(ball.samples[i].x, ball.samples[i].y, BALLSIZE, BALLSIZE, SWhite);
 }
 */
}

Pong::Pong() {
 Title("Snap.Pong");
 SetRect(0, 0, SCREENWIDTH, SCREENHEIGHT);
 MinimizeBox();

 player = Player(PLAYER, &ball);       // Init player
 computer = Player(COMPUTER, &ball);      // Init computer
 ball.SetPaddles(&player, &computer);     // Pass paddles to Ball class

 BackPaint();
 Update();
 SetTimeCallback(-25, THISBACK(Update));
}

GUI_APP_MAIN
{
 Pong().Run();
}
```

The errors say:
Quote:C:\Apps\Pong\main.cpp: In member function `void Ball::Update()':
C:\Apps\Pong\main.cpp:77: error: invalid use of undefined type `struct Player'
C:\Apps\Pong\main.cpp:14: error: forward declaration of `struct Player'

Apparently it doesn't like me referring to player, and if I reverse the ball and player classes, me referring to the ball class. So, I'm stuck again.

For some reason it doesn't like me

Subject: Re: Help with a possible design problem?
Posted by mirek on Sat, 03 Feb 2007 07:00:54 GMT
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snap2000 wrote on Fri, 02 February 2007 18:01So, basically pass it to the Ball constructor? That seems simple enough.

Yes, that is possible, but usually not quite necessarry.

Actually, recommended U++ style is to use default constructor if possible.

Mirek

Subject: Re: Help with a possible design problem?
Posted by mirek on Sat, 03 Feb 2007 07:02:02 GMT
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snap2000 wrote on Fri, 02 February 2007 19:04Apparently it doesn't like me referring to player, and if I reverse the ball and player classes, me referring to the ball class. So, I'm stuck again.

For some reason it doesn't like me

Move class Player declaration before Ball...

Mirek