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Department of Mathematics and Computing Science
CSCI 3430.1 - Principles of Programming Languages

Assignment #7

Assigned : October 30, 2017
Due : November 7, 2017

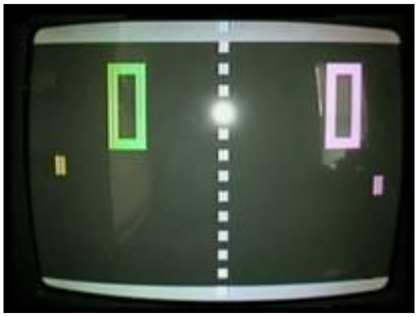
Please add all source code into one big zip file and post that to Moodle, it won't take more than **ONE** file. If it's too large to upload to Moodle, you likely have more than source code. If you are still stuck and can't upload the file, email it to me, cc to yourself then see me in class.

NOTE - You have a maximum upload of one 8 MB zip file, so you must leave off the stuff in the bin and debug directories to make it small enough to email. DO submit everything else need to build the thing, including the solution files (*.SLN), bitmaps, fonts animations or anything else you added to make it work.

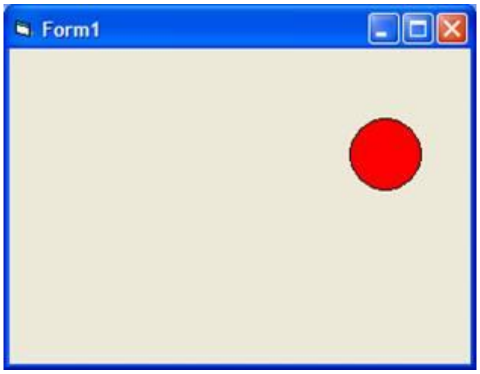
If you remove parts to reduce the size of the zip, please check that you are sending all of the parts. To do this, please exit visual studio, **rename** the original directory you zipped, move the zip to a **different** named directory on your computer, unzip it there, re-launch visual studio, then see if it still builds.

The whole 10 points

The objective is to re-create the game of pong that runs on a windows computer using VB.NET or C# (your choice). There are a ton of on-line walkthroughs, including http://www.dreamincode.net/forums/topic/39686-creating-a-fully-functional-pong-game/ . A good description of the rules can be found in https://en.wikipedia.org/wiki/Pong or http://www.ponggame.org .



The game is to move the paddles and bounce the moving ball across the playing field and try your best to hit it past your opponents paddle on the other side. You probably want to approach this in steps. First step would be to get the pong ball bouncing around. Make one small animated button or Gif or circle object within a single dialog form. Use a timer and add x and y offsets to the button with each tick of the timer clock. When the button hits the edge of the window, have the button change direction by generating a random x and y velocity away from the edge. Keep the button bouncing around in the window until the user clicks the file/exit, corner click. Experiment with clock interval and x/y value to generate smooth motion of the button on the lab computers without using all the CPU horsepower to keep things moving.



Once you are bouncing off the walls (the ball that is, not you), add the lines, paddles (1/4 the height of the form will work) and score counters.

a. Make sure that the paddles or the ball do not go off the edge of the screen.

b. The ball must bounce off of the front edge of the paddle, and bounce in the appropriate direction of travel (for a challenging pong, vary the deflection across the front surface of the paddle (a sharper deflection occurs if you are close to the top or bottom corner of the paddle).

c. The paddles will be controlled from the keyboard using Q=up, A=down or mouse control for the human player.

d. Add a computer player that always tracks the ball and is in the right place to bounce it (the unbeatable computer player so eventually you lose).

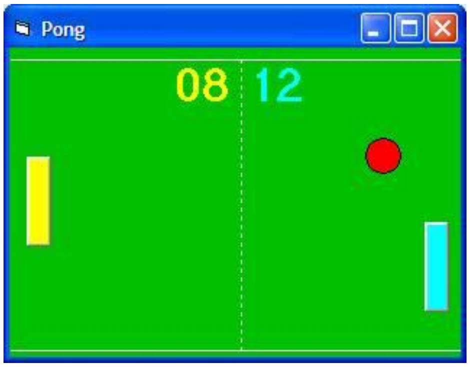
e. The score is incremented by one point when the ball impacts the wall, not a paddle.

f. The game ends when one side or the other gets to 15, a sound file is played (feel free to pick one) and the user is asked to try again with a "yes/no" response in a message box.

g. If the user clicks the "NO" button, the game exits

h. If the user clicks the "YES" button, the game restarts after resetting the score.

The easiest pong board is simple and could look something like below.



Feel free to add any "fun" features like make the form resizable while keeping contents the same proportions, add colors, sounds for points, collisions, missed balls, splitter balls, glowing green semi-transparent nuclear backgrounds or even "super" pong that shrinks the size of the paddles and increases speed for each bounce as the game goes along. To be really killer pong, speed up, shrink paddle size, occasionally deflect the ball off the paddle at a random angle, or do a top speed un-blockable ricochet.

If you would rather something more challenging, try one of these console games instead:

- battle pong http://www.ponggame.org/battle-pong.php
- 3-D pong http://www.ponggame.org/3dpong.php
- space invaders https://en.wikipedia.org/wiki/Space_Invaders (1978)
- centipede https://en.wikipedia.org/wiki/Centipede_(video_game) (1980)
  Or any other 1970's or 1980's game you wish to try.
  If you don't do the pong thing, let me know what you are going to do first.

But be warned that they are a lot harder to code than the simpler pong.