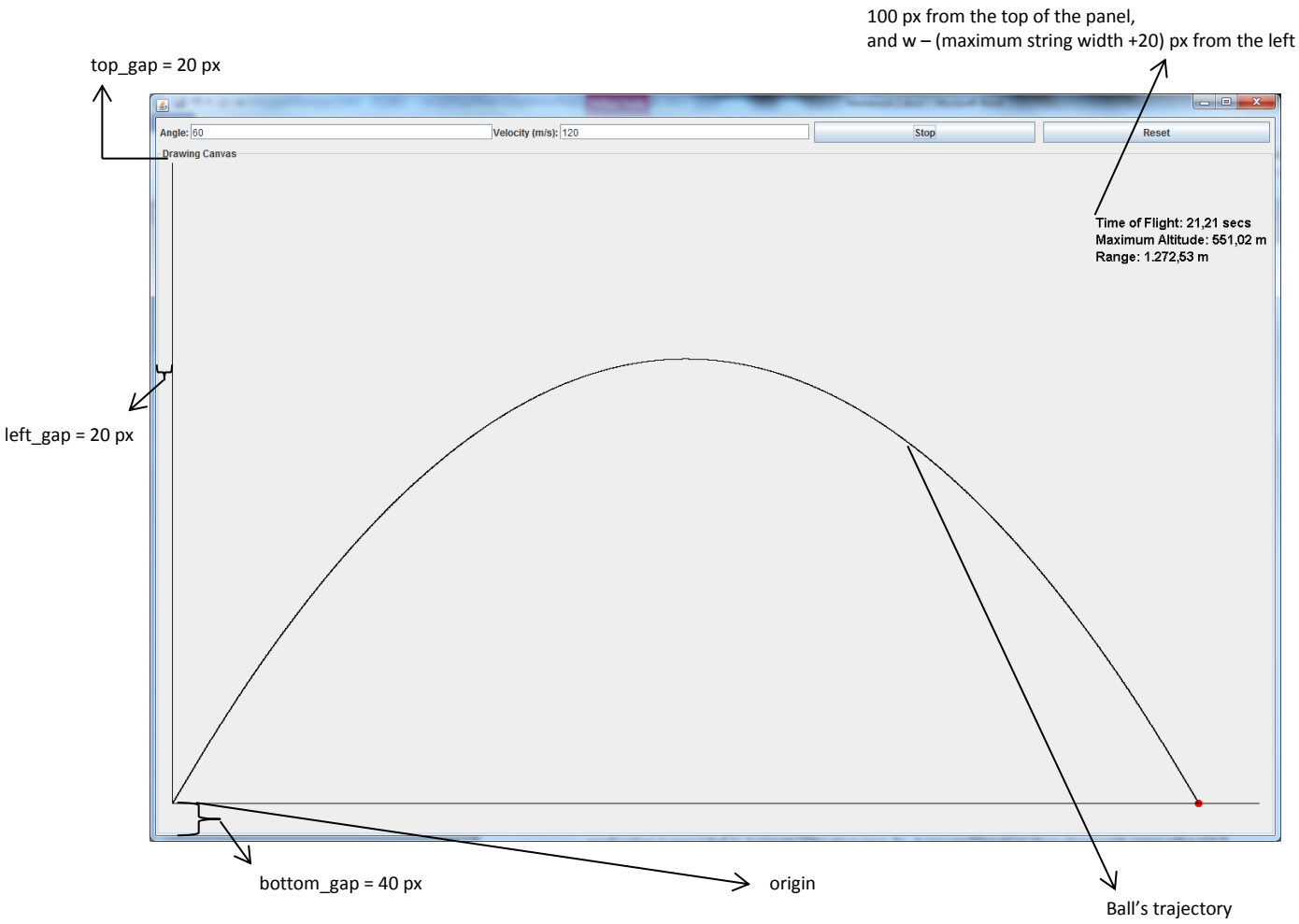
CS201 – Object-Oriented Software Development

Homework #2

Due Date: Wednesday, 10 December 2014 @ 23:59



In this assignment you are supposed implement "TwoDimensionalMotionPanel.java". The main GUI of the application is provided in Animate2Dmotion.java. In Animate2Dmotion class along with some other GUI components an instance of TwoDimensionalMotionPanel is created and added to Jframe's contentpane.

The goal of this application is to simulate a projectile motion. Initially a ball is located in the origin ((0, 0) coordinate). Through the GUI, you need to enter an angle in degrees and a initial velocity. When you click "Start" button, the ball starts moving from origin with the initial velocity and angle provided by the GUI. The text of the start button toggle at every click between "Start" and "Stop". If you click Stop the timer stops and the movement is paused. If you clik start again the ball resumes it's movement. When the ball reaches to the ground it stops and displays the maximum altitude, time of flight and the range on the panel.

In Animate2Dmotion class there is a Timer object, which refreshes the window at every 10 miliseconds. In other words at every 10 msec the the location of the ball is recalculated and the screen is repainted. **You do not need to change this class.** In TwoDimensionalMotionPanel you need to draw the coordinate system and a ball. In addition you are required to implement the following public methods in TwoDimensionalMotionPanel panel class:

```
/*

Initially the ball is located at the origin of the coordinate system. The
origin of the of coordinate system will change depending on the height of
the panel.

*/

/*
vel is an array of size 2. vel[0] is x component of the velocity vector and
vel[1] is the y component of the velocity vector.
*/
public void setVelocity(double[] vel):



/*
This method is called when reset button is clicked. This method stops the
projectile motion of the ball. The ball goes back its initial location (to
the origin)
*/
public void reset()


/*
This method is called by the timer at every 0.01 second (10 msecs), the
position of the ball is calculated and panel is repainted. In addition you
need to draw the trajectory of the ball. The method returns true when ball
hits to the ground. In other words the y component of the position vector
will be equal to zero.
*/
public boolean updatePosition()
```

Some implementation hints: You may need to keep a data field for the time which is initially set to 0 (zero). When reset is called is called you may also need to reset this time data field to zero. Whenever updatePosition method is called then you may need to increment the time 0.01 seconds. You can assume 1 meter = 1 pixel

Bonus: If you draw the major tickmarks (with an interval of 50 meters) and labels of the axis you will get 15 points bonus.

Guidelines:

1) Some points will be deducted for bad indendation and not having comments. Please explain your drawings by writing comments.
2) Zip all of your source files (the files with an extension of ".java") and rename your zip file as "firstname_lastname_hw2.zip" (Do not send ".class" files, just)
3) Upload your zip to Blackboard
4) Make sure that your project compiles successfully. The submission with compiler error will receive 0.

Sample Screenshots:

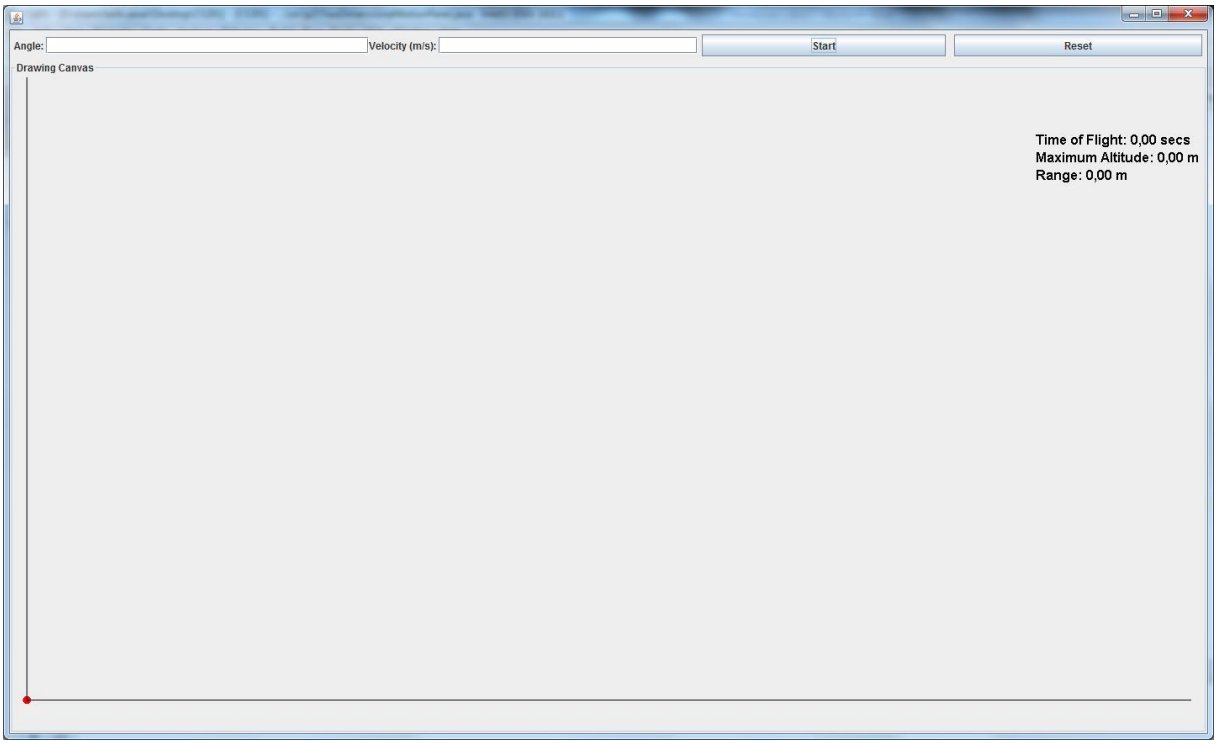


Figure 1. Initially ball is located at the origin

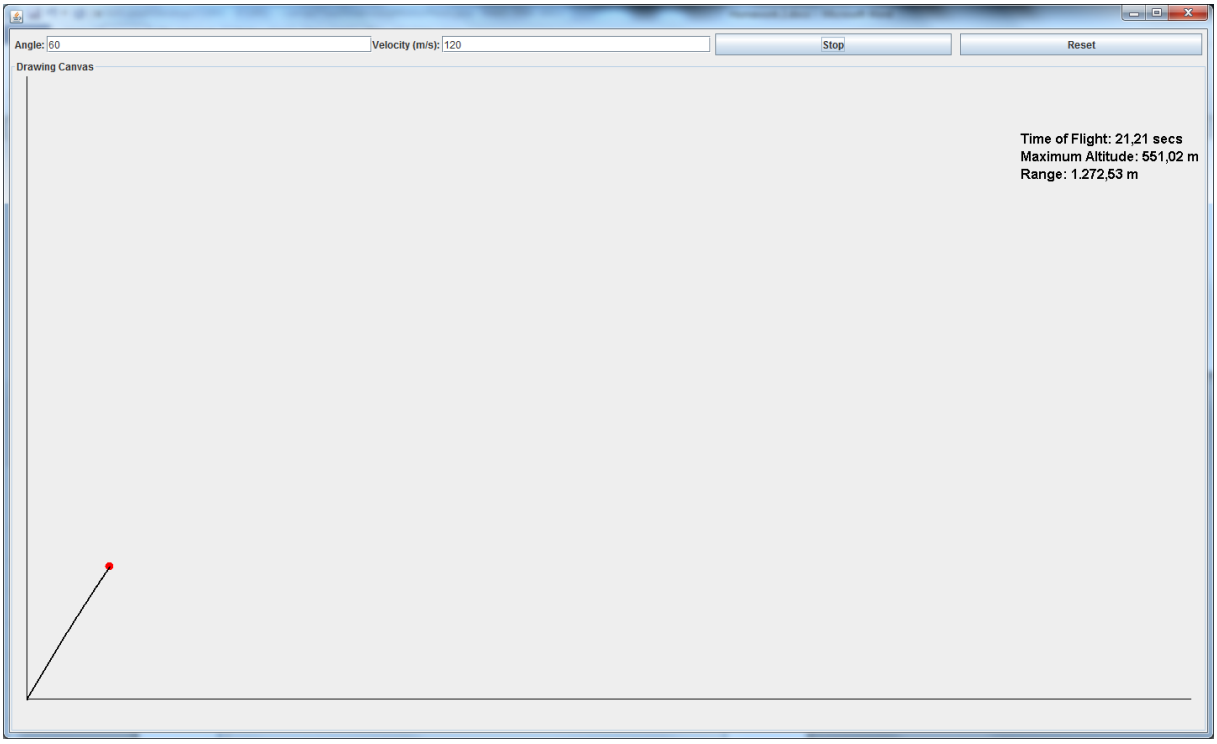


Figure 2. A few seconds after the ball is thrown

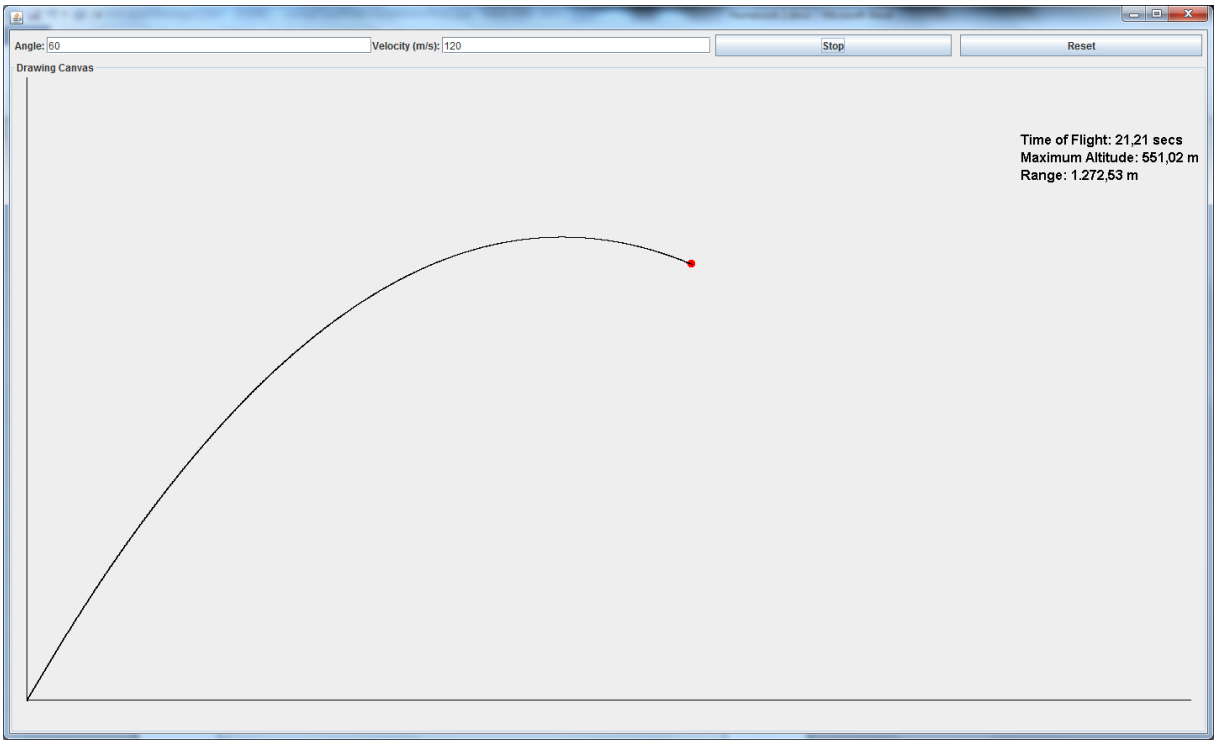


Figure 3. A few more seconds after the ball is thrown

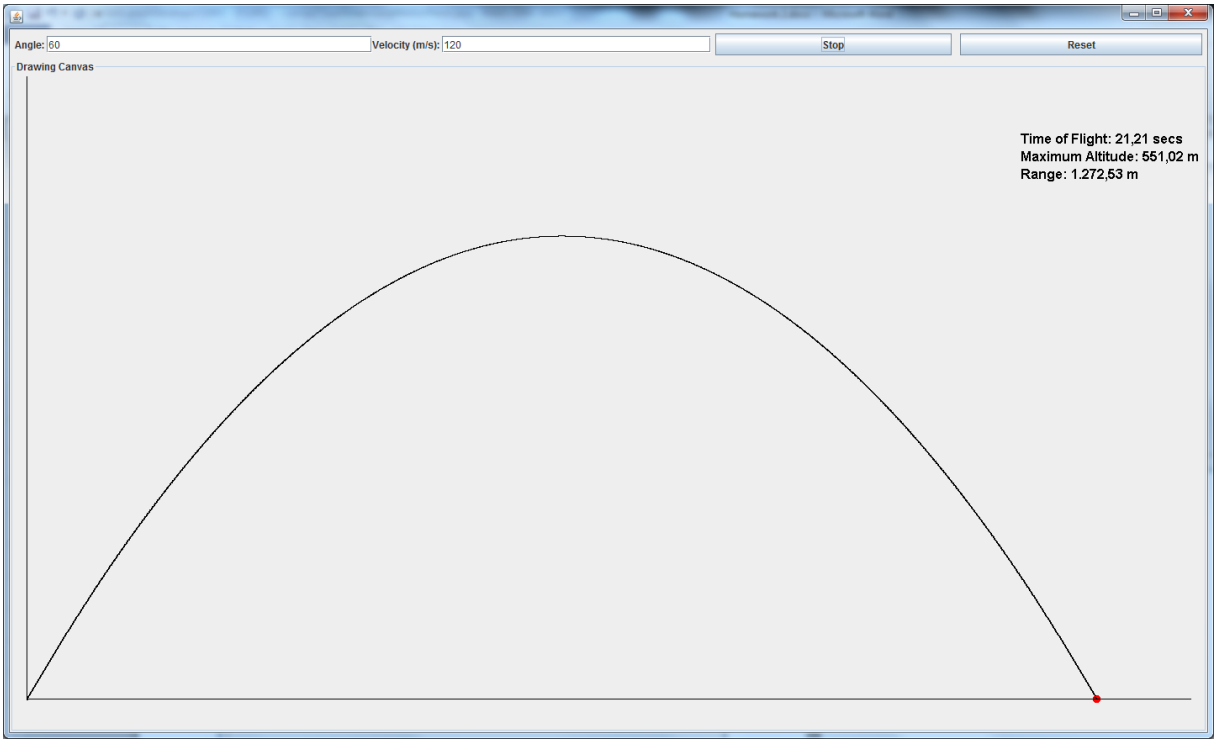


Figure 2. Finally the ball hits the ground