Clown Cannon 3 Assignment - Robert P.

Test Outputs:

ares.harpercollege.edu - PuTTY

```
e_prevost@ares:~/homeworkAssignments$ ./clownCannon3
Please Input Velocity (in mph) Followed by Angle (in degrees): -1 30
Hey! Please enter a velocity that is greater than 0 and an angle that is between 0 and 90 degrees!
Please Input Velocity (in mph) Followed by Angle (in degrees): -1 30
Hey! Please enter a velocity that is greater than 0 and an angle that is between 0 and 90 degrees!
Please Input Velocity (in mph) Followed by Angle (in degrees): 12 -3
Hey! Please enter a velocity that is greater than 0 and an angle that is between 0 and 90 degrees!
Please Input Velocity (in mph) Followed by Angle (in degrees): 12 120
Hey! Please enter a velocity that is greater than 0 and an angle that is between 0 and 90 degrees!
Please Input Velocity (in mph) Followed by Angle (in degrees): 50 50
Distance Travelled By Yikes the Clown in ft: 165.502 ft
Time spent in air in seconds: 3.51104 seconds
Time and x-distance and y-distance table in 20 intervals:
time:          x-distance     y-distance
0.000          0.000          0.000
0.185          8.711          9.835
0.370          17.421         18.576
0.554          26.132         26.226
0.739          34.843         32.782
0.924          43.553         38.246
1.109          52.264         42.617
1.294          60.975         45.895
1.478          69.685         48.080
1.663          78.396         49.173
1.848          87.107         49.173
2.033          95.817         48.080
2.217          104.528        45.895
2.402          113.238        42.617
2.587          121.949        38.246
2.772          130.660        32.782
2.957          139.370        26.226
3.141          148.081        18.576
3.326          156.792        9.835
3.511          165.502        -0.000
e_prevost@ares:~/homeworkAssignments$
```

Source Code:

clownCannon3.C - /home/students/e_prevost/homeworkAssignments/

File Edit Search Preferences Shell Macro Windows Help

```
/*  Clown Cannon 3
* Code Made By Robert Prevost
* Code takes in Max Velocity (mph) and angle (degrees & degrees)
* Code outputs Total distance travelled and Time spent in air
* Code also outputs a 20 interval table of x and y coordinates relative to time
* Code Written On: 9/21/2023
*/

#include <iostream>
#include <cstdlib>
#include <ctime>
#include <cmath>

using namespace std;
const double g = 32.0; //ft/sec

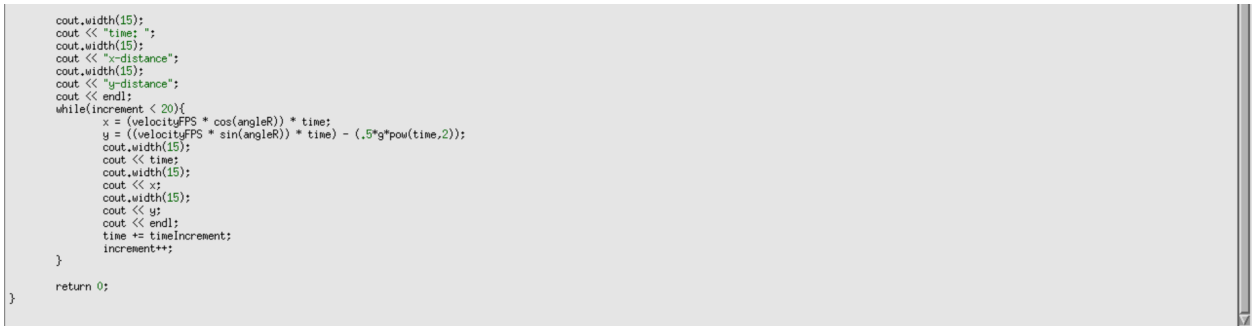
int main()
{
        int velocity = 0;//mph
        int angle = 0;//degrees
        cout << "Please Input Velocity (in mph) Followed by Angle (in degrees): ";
        cin >> velocity >> angle;


        while(velocity < 0 || angle < 0 || angle > 90){
                cout << "Hey! Please enter a velocity that is greater than 0 and an angle that is between 0 and 90 degrees!" << endl;
                cout << "Please Input Velocity (in mph) Followed by Angle (in degrees): ";
                cin >> velocity >> angle;
        }


        double angleR = angle*M_PI/180.0;
        double velocityFPS = (velocity * 5280.0) / 3600.0;
        int increment = 0;
        double x = 0.0, y = 0.0;
        double R = ((pow(velocityFPS,2.0))/g)*(sin(2*angleR));
        double timeIncrement = ((2*sin(angleR)*velocityFPS)/g)/19.0;
        double time = 0.0;

        cout<< "Distance Travelled By Yikes the Clown in ft: " << R << " ft" << endl;
        cout << "Time spent in air in seconds: " << (2*sin(angleR)*velocityFPS)/g << " seconds" << endl;
        cout<< "Time and x-distance and y-distance table in 20 intervals:" << endl;

        cout.precision(3);
        cout.setf(ios::fixed); //non-scientific notation
        cout.setf(ios::showpoint); //show the decimal point no matter what
        cout.setf(ios::left); //left-justify the number
```



```
        cout.width(15);
        cout << "time: ";
        cout.width(15);
        cout << "x-distance";
        cout.width(15);
        cout << "y-distance";
        cout << endl;
        while(increment < 20){
                x = (velocityFPS * cos(angleR)) * time;
                y = ((velocityFPS * sin(angleR)) * time) - (.5*g*pow(time,2));
                cout.width(15);
                cout << time;
                cout.width(15);
                cout << x;
                cout.width(15);
                cout << y;
                cout << endl;
                time += timeIncrement;
                increment++;
        }

        return 0;
}
```

Source Code Text:

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        double velocityFPS = (velocity * 5280.0) / 3600.0;
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	cout<< "Distance Travelled By Yikes the Clown in ft: " << R << " ft" << endl;
	cout << "Time spent in air in seconds: " << (2*sin(angleR)*velocityFPS)/g << " seconds"
<< endl;
	cout<< "Time and x-distance and y-distance table in 20 intervals:" << endl;

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		cout << x;
		cout.width(15);
		cout << y;
		cout << endl;
		time += timeIncrement;
		increment++;
	}

	return 0;
}
```