

## Graphics Lab Answer Sheet.

Please complete this answer sheet and turn it in at the beginning of class on the due date posted in LEARN.

### Part A

Question	Answer
1 (7 pts)	columnY is an array of integers within range of zero and height of the screen, each integer represents the height that a character will be at. step() creates the fading rain effect, and set the colors of the background of the characters.
2 (7 pts)	Canvas's keep what was printed on it between the loops, so when we move the letter down and loop back to draw it, the previous letter will remain. To make it fade we draw another transparent background to black but with a low opacity.
3 (7 pts)	The code in the first for loop where it says randomInt(0, height); needs to be replaced to columnY[i] = i*pixelsPerColumn;
4 (7 pts)	Inside the function where it says c.fillStyle = "rgba(0,0,0,0.05)"; needs to be replaced to c.fillStyle = "rgb(0,0,0)";
5 (7 pts)	Right below the first for loop where it says var characters = "0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ!@#\$%^&*"; needs to be replaced to var characters = "0123456789";
6 (7 pts)	The lines where it says columnY[i] += pixelsPerColumn; if (columnY[i] > height) { columnY[i] -= height; needs to be replaced to columnY[i] -= pixelsPerColumn;

	<pre>if (columnY[i] &lt; 0) {     columnY[i] += height;</pre>
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## Part B

7  
(7pts)

We draw a line starting at x and y; then we add dx and dy to x and y, we then finish a line at the new value of x and y. Brightness increases gradually each time the loop goes up by one.

8  
(7 pts)

Right under the step() function, the line where it says c.fillStyle = "#000"; should be replaced to c.fillStyle = "rgba(0,0,0,0.05)";

9  
(14 pts)

```
function resetStar(star) {  
    star.x = width/2;  
    star.y = height/2;  
    var speed = randomFloat(.1, 5);  
    var angle = randomFloat(0, 2*Math.PI);  
    star.dx = speed * Math.cos(angle);  
    star.dy = speed * Math.sin(angle);  
  
    let r = randomInt(0,letters.length);  
    star.letter = letters.substring(r,r+1);  
  
    star.brightness = randomFloat(2, 5);  
}  
  
var letters = "ABCDEFGHIJKLMNOPQRSTUVWXYZ";  
c.font = "12px Courier";  
  
var stars = [];  
for (var i=0; i<500; i++) {  
    var star = {};  
    resetStar(star);
```

```
    stars.push(star);
}

function step() {
    c.fillStyle = "#000";
    c.fillRect(0, 0, width, height);
    c.lineWidth = 2;
    for (var i=0; i<stars.length; i++) {
        var star = stars[i];

        star.brightness = Math.min(star.brightness*1.05,
255);

        var b = Math.round(star.brightness);
        c.fillStyle = "rgb(" + b + "," + b + "," + b + ")";

        star.x += star.dx;
        star.y += star.dy;
        star.dx *= 1.05;
        star.dy *= 1.05;

        c.fillText(star.letter, star.x, star.y);

        if (star.x < 0 || star.x > width || star.y < 0 || star.y >
height) {
            resetStar(star);
        }
    }
}

loop(step, 20);
```