**Creative Coding CA Report**

**Introduction:** In this CA we had to make a bar Chart and the bar chart of any data we could do with a story. I decided to do on the premier League Big 6 and for the charts I will calculate team out of the big were mostly successful last decade (2010,2020). Each bar Chart will contain different data to determine each team’s success one for trophies, one for league position, most goals scored/conceded and most points.

**Programming Methodology:** For each data for the chart, it contains an array and inside the data contains an object. Example would be let data02 = [{name: "Man United", goalScored: 681, goalConceded:332}. Inside the bar chart it needs to have a constructor. For the constructor

For the constructor it needs to calculate the chart Height and chart Width which the most important part of the chart.

Bar Chart: We had to calculate the bar Width for it work so I used an expression for the calculation.

this.tickSpacing = this.chartHeight / this.numTicks; //space between ticks on  the left

        this.availableWidth = this.chartWidth - (this.margin \* 2) - (this.spacing \* (this.data.length - 1)); //available space for bars

        this.barWidth = this.availableWidth / this.data.length; //bar width

After that we had to calculate the max Value so we wouldn’t want to have empty space for the chart so had to use data map (in order for it to make a new array) and function for the maxValue:  calculateMaxValue(){

        let listValues = this.data.map(function(x) {return x.points});

        this.maxValue = max(listValues);

        this.tickIncrements = (this.maxValue / this.numTicks);

    }

After that we use a drawRect function to have the number of bar Widths for our chart so for this we end up using a loop to have multiple bar Widths

push();

        translate(this.margin, 0);

        for(let i=0; i<this.data.length; i++){

            let colorNumber = i % 6;

            //bars

            fill(this.colors[colorNumber]);

            noStroke();

            rect((this.barWidth + this.spacing) \* i, 0, this.barWidth, this.scaledData(-this.data[i].points));

If someone wanted to know the values or Labels we to a true false for showing the values (this.showValues = true; , this.showLabels=true;)

if(this.showValues){

                noStroke();

                fill(0);

                textSize(16);

                textAlign(CENTER, BOTTOM);

                text(this.data[i].points, ((this.barWidth + this.spacing) \* i) + this.barWidth / 2, this.scaledData(-this.data[i].points));

            }

   To showLabels:

            if(this.showLabels){

                if(this.rotateLabels){

                    push();

                    noStroke();

                    fill(0);

                    textSize(14);

                    textAlign(LEFT, CENTER);

                    translate(((this.barWidth + this.spacing) \* i) + this.barWidth / 2, 10);

                    rotate(PI / 4);

                    text(this.data[i].name, 0, 0);

                    pop();

                }    else{

noStroke();

                    fill(0);

                    textSize(14);

                    textAlign(CENTER, BOTTOM);

                    text(this.data[i].name, ((this.barWidth + this.spacing) \* i) + this.barWidth / 2, 20);

                }

StackedBarChart: The stacked bar chart is the same for the normal bar Chart with same expressions and formula expect if you want add a bar Width on top of the other you need to add another loop with the values added and another translate.

 drawRects(){

        push();

        translate(this.margin, 0);

        for(let i=0; i<this.data.length; i++){

            push();

            for(let j=0; j<this.data[i].values.length; j++) {

            let colorNumber = j % 4;

            //bars

            fill(this.colors[colorNumber]);

            noStroke();

            rect((this.barWidth + this.spacing) \* i, 0, this.barWidth, this.scaledData(-this.data[i].values[j]));

            translate(0, this.scaledData(-this.data[i].values[j]));

            }

Scattered Chart for this chart it only involves dots on the x axis and y axis.

 drawRects(){

        push();

        translate(this.margin, 0);

        for(let i=0; i<this.data.length; i++){

            push();

            for(let j=0; j<this.data[i].values.length; j++) {

            let colorNumber = j % 4;

            //bars

            fill(this.colors[colorNumber]);

            noStroke();

            rect((this.barWidth + this.spacing) \* i, 0, this.barWidth, this.scaledData(-this.data[i].values[j]));

            translate(0, this.scaledData(-this.data[i].values[j]));

            }

Line Chart. In this chart you add a beginShape and endShape to get the lines with a loop and also use an ellipse to get the dots for x-axis and y-axis with a loop.