

Dota 2 Data

Games per week

We'll need to convert timestamps to dates and dates to week numbers

```
1: let toDateTime (timestamp:int) =
2:   let start = DateTime(1970,1,1,0,0,0,DateTimeKind.Utc)
3:   start.AddSeconds(float timestamp).ToLocalTime()
4:
5: let toWeekNumber (d:DateTime) =
6:   CultureInfo.CurrentCulture.DateTimeFormat.Calendar.GetWeekOfYear(
7:     d,
8:     CalendarWeekRule.FirstFourDayWeek,
9:     DayOfWeek.Monday)
10:
11: type OpenDotaPlayerData = JsonProvider<"https://api.opendota.com/api/players/71050296/matches"
12:
13: let dateToYearWeek (m:OpenDotaPlayerData.Root) =
14:   let d = m.StartTime |> toDateTime
15:   (d.Year,toWeekNumber d)
```

Make a series out of the data

```
1: let matchesToData (data:OpenDotaPlayerData.Root[]) =
2:   data
3:   |> Array.map dateToYearWeek
4:   |> Array.countBy id
5:   |> Array.where (fun ((y,_),_) -> (y = 2019))
6:   |> Array.map (fun ((y,w),c) -> (sprintf "%i/%i" y w , c))
7:   |> Array.sortBy fst
8:   |> Array.toList
```

Load the data, and transform it to have just number of games per "year/week"

```
1: let j2ghz = OpenDotaPlayerData.Load "https://api.opendota.com/api/players/71050296/matches"
2: let artic = OpenDotaPlayerData.Load "https://api.opendota.com/api/players/101483335/matches"
3: let simik = OpenDotaPlayerData.Load "https://api.opendota.com/api/players/94313396/matches"
4: let data = [artic;j2ghz;simik]
```

And in a chart:

```

1: data
2: |> Chart.Area
3: |> Chart.WithOptions (Options( isStacked = true ))
4: |> Chart.WithLabels [ "ArticCz"; "J2ghz"; "ssimik"]
5: |> Chart.WithLegend true

<div class="fslab-html-output"><script type="text/javascript"> google.charts.setOnLoadCallback(drawChart)
function drawChart() if ("") google.visualization.mapsApiKey = ""
    var data = new google.visualization.DataTable("cols": [{"type": "string"
,"id": "Column 1","label": "Column 1", "type": "number", "id": "ArticCz"
,"label": "ArticCz", "type": "number", "id": "J2ghz", "label": "J2ghz",
,"type": "number", "id": "ssimik", "label": "ssimik"}], "rows": [{"c": [{"v":
"2019/20", "v": 8, "v": 12, }, "c": [{"v": "2019/21", "v": 7, "v": 18, "v": 3},
,"c": [{"v": "2019/22", "v": 9, "v": 10, "v": 10}, "c": [{"v": "2019/23", "v": 5,
,"v": 10, "v": 4}, "c": [{"v": "2019/27", "v": 7, "v": 7, }, "c": [{"v": "2019/28",
,"v": 4, "v": 4, }, "c": [{"v": "2019/29", "v": 2, "v": 6, }, "c": [{"v": "2019/30",
,"v": 2, "v": 2, }, "c": [{"v": "2019/31", "v": 4, "v": 4, }, "c": [{"v": "2019/32",
,"v": 5, "v": 5, }, "c": [{"v": "2019/33", "v": 7, "v": 9, }, "c": [{"v": "2019/34",
,"v": 5, "v": 5, "v": 1}, "c": [{"v": "2019/35", "v": 4, "v": 4, "v": 1}, "c": [
,"v": "2019/36", "v": 8, "v": 8, }, "c": [{"v": "2019/37", "v": 11, "v": 17, "v":
23}, "c": [{"v": "2019/38", "v": 5, "v": 5, "v": 11}, "c": [{"v": "2019/39", "v":
5, "v": 5, "v": 7}, "c": [{"v": "2019/40", "v": 3, "v": 7, "v": 17}, "c": [{"v":
"2019/42", "v": 5, "v": 2, "v": 12}, "c": [{"v": "2019/43", "v": 1, "v": 1, "v":
15}, "c": [{"v": "2019/41", , "v": 2, "v": 16}]]);
    var options = "backgroundColor": "fill": "transparent", "chartArea": "backgroundColor": "fill": "f4f4f4", "color
    var chart = new google.visualization.AreaChart(document.getElementById('d1d94c45-
11f3-4b59-9c55-5da6c9521b68')); chart.draw(data, options); </script> <div
id="d1d94c45-11f3-4b59-9c55-5da6c9521b68" style="width: 800px; height: 450px;"></div></div>

```

Win rate compared to match length

```

1: OpenDotaPlayerData.Load "https://api.opendota.com/api/players/71050296/matches"
2: |> Array.map (fun m -> m.Duration, if m.Deaths > 0 then (m.Kills |> double) / (m.Deaths |> double))
3: |> Chart.Scatter

```

```

<div class="fslab-html-output"><script type="text/javascript"> google.charts.setOnLoadCallback(drawChart)
function drawChart() if ("") google.visualization.mapsApiKey = ""
    var data = new google.visualization.DataTable("cols": [{"type": "number"
,"id": "Column 1","label": "Column 1", "type": "number", "id": "Column
2","label": "Column 2"}], "rows": [{"c": [{"v": 2679, "v": 0.0909090909090909},
,"c": [{"v": 2816, "v": 0.142857142857143}, "c": [{"v": 1808, "v": 0.272727272727273},
,"c": [{"v": 1979, "v": 0.625}, "c": [{"v": 1882, "v": 1.333333333333333},
,"c": [{"v": 2680, "v": 0.428571428571429}, "c": [{"v": 2567, "v": 0.4}, "c":
: [{"v": 2463, "v": 0.333333333333333}, "c": [{"v": 1918, "v": 0.25}, "c": [
,"v": 2359, "v": 0], "c": [{"v": 3383, "v": 0.636363636363636}, "c": [{"v":
1952, "v": 0.363636363636364}, "c": [{"v": 2354, "v": 0.222222222222222}],

```

"c" : ["v": 2590, "v": 0.08333333333333333], "c" : ["v": 1735, "v": 15], "c"
 : ["v": 2272, "v": 0.875], "c" : ["v": 4043, "v": 0.3], "c" : ["v": 1490, "v":
 0.0769230769230769], "c" : ["v": 3147, "v": 0.5], "c" : ["v": 4093, "v": 0.25],
 "c" : ["v": 2794, "v": 0.3], "c" : ["v": 3120, "v": 0.75], "c" : ["v": 3430,
 "v": 0.5555555555555556], "c" : ["v": 3159, "v": 0.25], "c" : ["v": 2351,
 "v": 0.571428571428571], "c" : ["v": 2500, "v": 0.2], "c" : ["v": 2448, "v":
 0.6666666666666667], "c" : ["v": 2775, "v": 0.307692307692308], "c" : ["v":
 2028, "v": 0.2222222222222222], "c" : ["v": 2684, "v": 0.8], "c" : ["v": 1674,
 "v": 0.25], "c" : ["v": 1467, "v": 0.1666666666666667], "c" : ["v": 2682, "v":
 2], "c" : ["v": 3826, "v": 0.45], "c" : ["v": 1620, "v": 2.5], "c" : ["v": 2520,
 "v": 1.57142857142857], "c" : ["v": 3186, "v": 1.166666666666667], "c" : ["v":
 1895, "v": 0.3], "c" : ["v": 2262, "v": 4.5], "c" : ["v": 2846, "v": 1], "c" : ["v":
 2237, "v": 0.142857142857143], "c" : ["v": 1829, "v": 0.1666666666666667], "c"
 : ["v": 2188, "v": 0.5], "c" : ["v": 2023, "v": 0.571428571428571], "c" : ["v":
 2224, "v": 0.625], "c" : ["v": 2691, "v": 1.8333333333333333], "c" : ["v": 2298,
 "v": 0.8888888888888889], "c" : ["v": 4029, "v": 0.181818181818182], "c" : ["v":
 2076, "v": 0.0909090909090909], "c" : ["v": 2288, "v": 0.428571428571429], "c"
 : ["v": 1534, "v": 0.307692307692308], "c" : ["v": 2416, "v": 0.5], "c" : ["v":
 2010, "v": 0.625], "c" : ["v": 2512, "v": 2.2], "c" : ["v": 2418, "v": 0.25], "c" :
 ["v": 3057, "v": 0], "c" : ["v": 2121, "v": 0.181818181818182], "c" : ["v": 2615,
 "v": 0.272727272727273], "c" : ["v": 1809, "v": 0.2], "c" : ["v": 1579, "v":
 0.3333333333333333], "c" : ["v": 1984, "v": 2.3333333333333333], "c" : ["v": 2803,
 "v": 0.4545454545454545], "c" : ["v": 2564, "v": 0.5555555555555556], "c" : ["v":
 1673, "v": 0.0909090909090909], "c" : ["v": 3893, "v": 0.235294117647059], "c"
 : ["v": 2481, "v": 0.3333333333333333], "c" : ["v": 2149, "v": 0.857142857142857],
 "c" : ["v": 3286, "v": 0.5], "c" : ["v": 3488, "v": 0.411764705882353], "c" :
 ["v": 2457, "v": 0.2], "c" : ["v": 2515, "v": 0.6363636363636363], "c" : ["v":
 1897, "v": 0.285714285714286], "c" : ["v": 2827, "v": 0.428571428571429],
 "c" : ["v": 2054, "v": 0.5], "c" : ["v": 3010, "v": 0.235294117647059], "c"
 : ["v": 2085, "v": 0.2], "c" : ["v": 3267, "v": 0.2222222222222222], "c"
 : ["v": 2295, "v": 0], "c" : ["v": 1874, "v": 0], "c" : ["v": 2094, "v":
 0.0909090909090909], "c" : ["v": 2468, "v": 0.272727272727273], "c" : ["v":
 1969, "v": 0.25], "c" : ["v": 1987, "v": 0.2], "c" : ["v": 2772, "v": 0.2], "c"
 : ["v": 2602, "v": 0.25], "c" : ["v": 1774, "v": 0.307692307692308], "c" :
 ["v": 2217, "v": 0.2222222222222222], "c" : ["v": 4149, "v": 0.5], "c" : ["v":
 1834, "v": 0.2222222222222222], "c" : ["v": 2357, "v": 0.1666666666666667], "c"
 : ["v": 2210, "v": 0.25], "c" : ["v": 2452, "v": 2.5], "c" : ["v": 2505, "v":
 0.428571428571429], "c" : ["v": 1609, "v": 0.08333333333333333], "c" : ["v":
 3142, "v": 0.625], "c" : ["v": 2234, "v": 0.181818181818182], "c" : ["v": 2580,
 "v": 0.2222222222222222], "c" : ["v": 2044, "v": 0.272727272727273], "c" : ["v":
 1377, "v": 0.2], "c" : ["v": 2644, "v": 0], "c" : ["v": 2777, "v": 0.1875], "c"
 : ["v": 2576, "v": 1.28571428571429], "c" : ["v": 1496, "v": 0], "c" : ["v":
 1938, "v": 0.1111111111111111], "c" : ["v": 2772, "v": 0.692307692307692],
 "c" : ["v": 2022, "v": 0.25], "c" : ["v": 906, "v": 1], "c" : ["v": 1647,
 "v": 0.142857142857143], "c" : ["v": 2127, "v": 0.1111111111111111], "c" :
 ["v": 1516, "v": 1.5], "c" : ["v": 3329, "v": 0], "c" : ["v": 2565, "v":

0.27272727272727273], "c" : ["v": 1947, "v": 2], "c" : ["v": 2149, "v": 0.08333333333333333],
 "c" : ["v": 2644, "v": 0.3333333333333333], "c" : ["v": 2403, "v": 0.0714285714285714],
 "c" : ["v": 1911, "v": 0.375], "c" : ["v": 3086, "v": 0.285714285714286], "c"
 : ["v": 2110, "v": 0.142857142857143], "c" : ["v": 2076, "v": 0.25], "c" :
 ["v": 1917, "v": 0.285714285714286], "c" : ["v": 2049, "v": 0], "c" : ["v":
 2008, "v": 0.3333333333333333], "c" : ["v": 1604, "v": 0.2], "c" : ["v": 3059,
 "v": 0.4545454545454545], "c" : ["v": 2072, "v": 0.428571428571429], "c" :
 ["v": 1637, "v": 0], "c" : ["v": 1937, "v": 0], "c" : ["v": 1537, "v": 0.1],
 "c" : ["v": 1925, "v": 0.2222222222222222], "c" : ["v": 1874, "v": 0.1], "c"
 : ["v": 2754, "v": 0.25], "c" : ["v": 1594, "v": 3], "c" : ["v": 1651, "v":
 0.4444444444444444], "c" : ["v": 2109, "v": 0.5454545454545454], "c" : ["v":
 2712, "v": 0.2222222222222222], "c" : ["v": 2531, "v": 0.2222222222222222], "c" :
 ["v": 2812, "v": 0.214285714285714], "c" : ["v": 2110, "v": 0.888888888888889],
 "c" : ["v": 2356, "v": 0.4545454545454545], "c" : ["v": 2388, "v": 0.4], "c" :
 ["v": 2236, "v": 0.1], "c" : ["v": 3398, "v": 0.6363636363636363], "c" : ["v":
 2398, "v": 0.142857142857143], "c" : ["v": 3246, "v": 0.375], "c" : ["v": 2123,
 "v": 0.4166666666666667], "c" : ["v": 1636, "v": 0.125], "c" : ["v": 2027, "v":
 0.25], "c" : ["v": 1655, "v": 0.3], "c" : ["v": 2524, "v": 0.08333333333333333],
 "c" : ["v": 2095, "v": 2], "c" : ["v": 2970, "v": 0.4375], "c" : ["v": 1871,
 "v": 0.428571428571429], "c" : ["v": 1825, "v": 0.1111111111111111], "c" :
 ["v": 936, "v": 1], "c" : ["v": 3346, "v": 0.2666666666666667], "c" : ["v":
 2621, "v": 0.3333333333333333], "c" : ["v": 2480, "v": 0.5833333333333333],
 "c" : ["v": 1872, "v": 0], "c" : ["v": 1876, "v": 0.1666666666666667], "c" :
 ["v": 1784, "v": 0.1111111111111111], "c" : ["v": 2388, "v": 0], "c" : ["v":
 1670, "v": 0.1666666666666667], "c" : ["v": 2218, "v": 1], "c" : ["v": 2394,
 "v": 0.285714285714286], "c" : ["v": 3067, "v": 0.5833333333333333], "c" :
 ["v": 2576, "v": 0.375], "c" : ["v": 2034, "v": 0.1666666666666667], "c" :
 ["v": 2616, "v": 0.3636363636363636], "c" : ["v": 2262, "v": 0], "c" : ["v":
 1922, "v": 0.1666666666666667], "c" : ["v": 1716, "v": 0.1666666666666667],
 "c" : ["v": 1576, "v": 0], "c" : ["v": 873, "v": 0.2], "c" : ["v": 2055,
 "v": 0.6666666666666667], "c" : ["v": 2976, "v": 0.25], "c" : ["v": 2607,
 "v": 0.230769230769231], "c" : ["v": 2065, "v": 0.2], "c" : ["v": 2362, "v":
 0.3333333333333333], "c" : ["v": 3672, "v": 0.181818181818182], "c" : ["v":
 2252, "v": 0.2222222222222222], "c" : ["v": 2018, "v": 1.5], "c" : ["v": 2874,
 "v": 0], "c" : ["v": 2439, "v": 0.5], "c" : ["v": 1201, "v": 0], "c" : ["v": 2185,
 "v": 0.428571428571429], "c" : ["v": 2616, "v": 0.875], "c" : ["v": 2930, "v":
 1.75], "c" : ["v": 2262, "v": 1], "c" : ["v": 1981, "v": 0.0909090909090909],
 "c" : ["v": 2134, "v": 0], "c" : ["v": 2828, "v": 0.4166666666666667], "c" : ["v":
 3060, "v": 0.125], "c" : ["v": 2236, "v": 0.1], "c" : ["v": 2985, "v": 0.6], "c"
 : ["v": 2341, "v": 2.666666666666667], "c" : ["v": 1170, "v": 0], "c" : ["v":
 1849, "v": 0.2222222222222222], "c" : ["v": 2216, "v": 0.272727272727273], "c"
 : ["v": 2201, "v": 0.4], "c" : ["v": 2486, "v": 1.2], "c" : ["v": 2484, "v":
 0.08333333333333333], "c" : ["v": 1889, "v": 0.3333333333333333], "c" : ["v":
 2386, "v": 0.8333333333333333], "c" : ["v": 2721, "v": 2], "c" : ["v": 2606, "v":
 0.2], "c" : ["v": 2072, "v": 0.125], "c" : ["v": 2618, "v": 0.294117647058824],
 "c" : ["v": 949, "v": 1], "c" : ["v": 1964, "v": 0.1666666666666667], "c" : ["v":

2152, "v": 8], "c" : ["v": 1984, "v": 0.285714285714286], "c" : ["v": 2849, "v": 3], "c" : ["v": 2963, "v": 0.5], "c" : ["v": 1744, "v": 0.222222222222222], "c" : ["v": 2260, "v": 1.5], "c" : ["v": 2142, "v": 0.133333333333333], "c" : ["v": 2958, "v": 0.875], "c" : ["v": 1744, "v": 0.3], "c" : ["v": 2798, "v": 0.714285714285714], "c" : ["v": 2973, "v": 0.0909090909090909], "c" : ["v": 2488, "v": 1.4], "c" : ["v": 3031, "v": 0.416666666666667], "c" : ["v": 2301, "v": 0.416666666666667], "c" : ["v": 2621, "v": 0.0833333333333333], "c" : ["v": 2011, "v": 0.1], "c" : ["v": 1790, "v": 0], "c" : ["v": 2951, "v": 0.333333333333333], "c" : ["v": 675, "v": 0], "c" : ["v": 3001, "v": 0.75], "c" : ["v": 2798, "v": 0.142857142857143], "c" : ["v": 964, "v": 3], "c" : ["v": 3747, "v": 0.5], "c" : ["v": 2913, "v": 7], "c" : ["v": 2391, "v": 0.444444444444444], "c" : ["v": 2050, "v": 0.6], "c" : ["v": 2520, "v": 1.875], "c" : ["v": 894, "v": 0.666666666666667], "c" : ["v": 2255, "v": 0.0625], "c" : ["v": 2221, "v": 0], "c" : ["v": 1816, "v": 0.4], "c" : ["v": 1809, "v": 0.625], "c" : ["v": 3174, "v": 0.583333333333333], "c" : ["v": 2287, "v": 3.4], "c" : ["v": 2785, "v": 2.28571428571429], "c" : ["v": 2250, "v": 2.5], "c" : ["v": 2106, "v": 0.307692307692308], "c" : ["v": 2106, "v": 2.5], "c" : ["v": 444, "v": 0], "c" : ["v": 3047, "v": 0.416666666666667], "c" : ["v": 1551, "v": 2], "c" : ["v": 2191, "v": 1], "c" : ["v": 2916, "v": 1.125], "c" : ["v": 2305, "v": 1.5], "c" : ["v": 2240, "v": 1.16666666666667], "c" : ["v": 2455, "v": 1.4], "c" : ["v": 2249, "v": 3], "c" : ["v": 2981, "v": 0.166666666666667], "c" : ["v": 2633, "v": 0.454545454545455], "c" : ["v": 2361, "v": 0.333333333333333], "c" : ["v": 2195, "v": 0], "c" : ["v": 2022, "v": 0.0625], "c" : ["v": 1544, "v": 7], "c" : ["v": 2005, "v": 0.6], "c" : ["v": 2665, "v": 4], "c" : ["v": 771, "v": 1], "c" : ["v": 2391, "v": 0], "c" : ["v": 2841, "v": 2], "c" : ["v": 2302, "v": 0.454545454545455], "c" : ["v": 2006, "v": 0.461538461538462], "c" : ["v": 2899, "v": 1.66666666666667], "c" : ["v": 2172, "v": 10], "c" : ["v": 1873, "v": 0.25], "c" : ["v": 3475, "v": 1.08333333333333], "c" : ["v": 2172, "v": 0.133333333333333], "c" : ["v": 2460, "v": 1.14285714285714], "c" : ["v": 2419, "v": 3.33333333333333], "c" : ["v": 2947, "v": 0.5], "c" : ["v": 3124, "v": 0.777777777777778], "c" : ["v": 2120, "v": 0], "c" : ["v": 2526, "v": 0.142857142857143], "c" : ["v": 1858, "v": 0], "c" : ["v": 2959, "v": 0.222222222222222], "c" : ["v": 2479, "v": 0.2], "c" : ["v": 3337, "v": 1.66666666666667], "c" : ["v": 3258, "v": 1.16666666666667], "c" : ["v": 1826, "v": 0], "c" : ["v": 2644, "v": 2], "c" : ["v": 2359, "v": 1.6], "c" : ["v": 2175, "v": 0.4], "c" : ["v": 4193, "v": 0.5], "c" : ["v": 2755, "v": 6.5], "c" : ["v": 2997, "v": 0.4], "c" : ["v": 3021, "v": 1], "c" : ["v": 1319, "v": 0], "c" : ["v": 2624, "v": 0.5], "c" : ["v": 2174, "v": 0.666666666666667], "c" : ["v": 2645, "v": 0.571428571428571], "c" : ["v": 1932, "v": 5], "c" : ["v": 3637, "v": 1.09090909090909], "c" : ["v": 2358, "v": 6], "c" : ["v": 1844, "v": 1], "c" : ["v": 2366, "v": 0.333333333333333], "c" : ["v": 2442, "v": 0.1], "c" : ["v": 3403, "v": 1], "c" : ["v": 2100, "v": 0.142857142857143], "c" : ["v": 2272, "v": 0.333333333333333], "c" : ["v": 2238, "v": 0.4], "c" : ["v": 2904, "v": 1.16666666666667], "c" : ["v": 2156, "v": 0], "c" : ["v": 3946, "v": 0.333333333333333], "c" : ["v": 2393, "v": 0.6], "c" : ["v": 1233, "v": 0], "c" : ["v": 2451, "v": 1], "c" : ["v": 2163, "v": 0.625], "c" : ["v": 2927, "v": 0.5],

```

    "c" : ["v": 1850, "v": 8], "c" : ["v": 2172, "v": 0], "c" : ["v": 1710, "v": 2],
    "c" : ["v": 2244, "v": 1.25], "c" : ["v": 1876, "v": 0.285714285714286], "c" :
    ["v": 3215, "v": 0.909090909090909], "c" : ["v": 2675, "v": 2.25], "c" : ["v":
    2694, "v": 0], "c" : ["v": 3654, "v": 0.444444444444444], "c" : ["v": 1550,
    "v": 0.333333333333333], "c" : ["v": 2466, "v": 2.25], "c" : ["v": 1477, "v":
    0], "c" : ["v": 2388, "v": 0.2], "c" : ["v": 2439, "v": 0.111111111111111], "c"
    : ["v": 2767, "v": 1], "c" : ["v": 2909, "v": 1.166666666666667], "c" : ["v":
    1801, "v": 0.333333333333333], "c" : ["v": 2244, "v": 0], "c" : ["v": 1888, "v":
    0.75], "c" : ["v": 2132, "v": 11], "c" : ["v": 2474, "v": 0.545454545454545],
    "c" : ["v": 2735, "v": 0.666666666666667], "c" : ["v": 3714, "v": 3], "c" : ["v":
    2461, "v": 0.857142857142857], "c" : ["v": 693, "v": 0], "c" : ["v": 1311, "v":
    0.666666666666667]]);
    var options = "backgroundColor":"fill":"transparent", "chartArea":"backgroundColor":"fill":"f4f4f4", "colors":
    var chart = new google.visualization.ScatterChart(document.getElementById('32caca9f-
    6a73-4d44-8a4c-3b299bbdf334')); chart.draw(data, options); </script> <div
    id="32caca9f-6a73-4d44-8a4c-3b299bbdf334" style="width: 800px; height: 450px;"></div></div>

```