CTIS 255 – Midterm 2

Duration: 135 mins.

Don't forget to download "mt.zip" file that contains required arrays (*q3-db.js***) and video files (***q1.mp4, q2.mp4, and q3.mp4***). The video files show what you are supposed to do.**

Q1 (35Pts) Write a javascript program that fulfill the following tasks:

    a. **(15Pts)** Show an array with 5 random numbers, each of which is between [0, 20]

    b. **(10Pts)** The numbers are unique, that is, a number should not repeat itself in the array.

    c. **(10Pts)** Show the median of the array. **Hint**: sort the numeric array.

<p align="center">Random Array : [6 , 12 , 18 , 9 , 10]</p>

<p align="center">Median :   10</p>
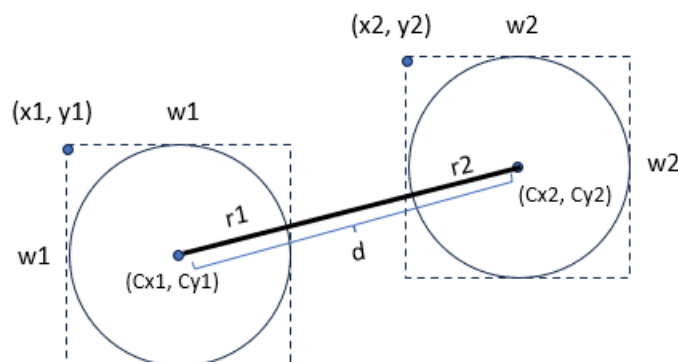
<p align="center">Fig 1: A sample run.</p>

Q2 (30Pts) Write a javascript program that creates random circles:

    a. **(5Pts)** Create a rectangular region with a dimension of 500x500px, centered, 1px solid #999 border, and #DDD background-color.

    b. **(10Pts)** Generate 100 random circles <u>within</u> this rectangular region. The diameter of a circle is between [10, 100] and apply a black border. **Hint**: *you can use a div element for a circle. Just set its* ***"border-radius:100%"***. *Use <u>absolute positioning</u> to place a circle.*

       Example:

```
<div style="left:10px; top:20px; width:50px; height:50px; border-radius:100%"></div>
```

    c. **(5Pts)** Set a random background color for the circles.

    d. **(10Pts)** The circles don't overlap with each other. **Hint** for the calculation in Fig 2.

For a Div: (x, y, w)
Radius **r = w / 2**
Center Point = **(x + r, y + r)**

Distance between two points:
$d^2 = (Cx1 - Cx2)^2 + (Cy1 - Cy2)^2$

Overlapping Test:
$d^2 < (r1 + r2)^2$: circles overlap

<p align="center">Fig 2: Test if two circles overlap</p>

Q3 (35Pts) Write a javascript program that allows querying orders of a particular user.

a. (**12Pts**) Show the first three products in "products" array. Use the layout in Fig 3. Set the size of the images to 60px, and the price color is "orange". (Do not forget to import **q3-db.js** in the first place)

b. (**5Pts**) The listbox has its items (user names) from the "users" array. Hint: Create "<option>" tags with javascript.

c. (**10Pts**) Hit "Show Orders" button to tabulate the orders of the selected user as in Fig3.

d. (**3Pts**) Show Grand Total at the bottom

e. (**5Pts**) Subtotal checkbox control the visibility of "subtotal" in each order item.

Fig 3: A sample run

Attention:

- Submit ***name_surname.zip*** (do not use mt2_name_surname.zip , 203454323_name_surname.zip, etc), otherwise, **I will drop 3pts from your grade**.
- You are free to use any materials. However, USB devices are strictly forbidden during the exam.
- You don't have to use external CSS or JS. You can write everything in a single html page.

GOOD LUCK