CANVAS, ANIMATION, GAME DEVELOPMENT

Programmatically create graphics in the browser with the Canvas API. Creating animations and games with fast state re-rendering.

CANVAS

The `canvas` HTML element provides a programming interface (Canvas API) for creating graphics programmatically. We can draw on the `2d` context of the `canvas` elmeent.

```
const canvas =
  document.querySelector("canvas");
const context =
  canvas.getContext("2d");
```

DRAWING WITH PATHS

We can define paths on the canvas with simple shapes:

```
context.beginPath();
context.moveTo(x, y);
context.lineTo(x, y);
context.rect(x, y, w, h);
context.arc(x, y, r, aStart, aEnd);
```

After defining a path it is possible to stroke its outline or fill it with a color:

```
context.stroke();
context.fill();
```

It is also possible to draw text on a canvas:

```
context.fillText(text, x, y);
```

PROPERTIES OF DRAWING TOOLS

We can set various properties of the drawing "pen" through the `context` object:

Fill color: `context.fillStyle`

Stroke color: `context.strokeStyle`

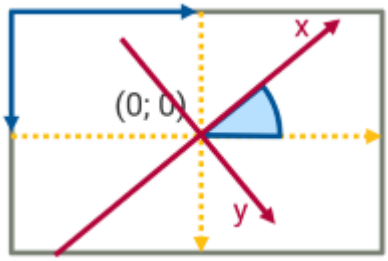
Stroke with: `context.lineWidth`

Text align: `context.textAlign`

Font family and size: `context.font`

COORDINATE SYSTEM TRANSFORMATIONS

The coordinate system of the canvas can be **transformed** freely (translation, rotation, scaling):




```
context.translate(x, y);
context.rotate(angle);
context.scale(s);
```

The current transformation can be saved and restored later:

```
context.save();
context.restore();
```

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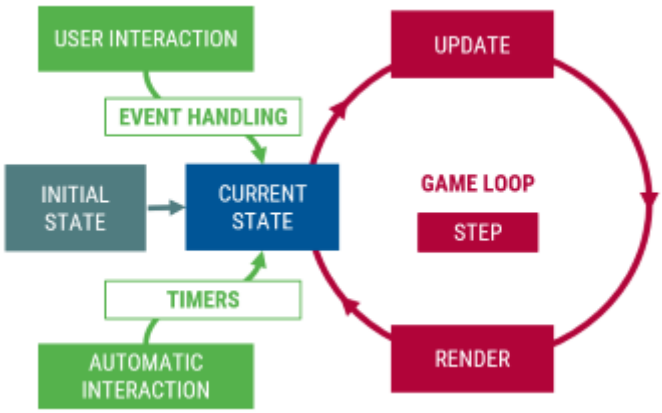

REFERENCES

Canvas API
Context