

# CIAO

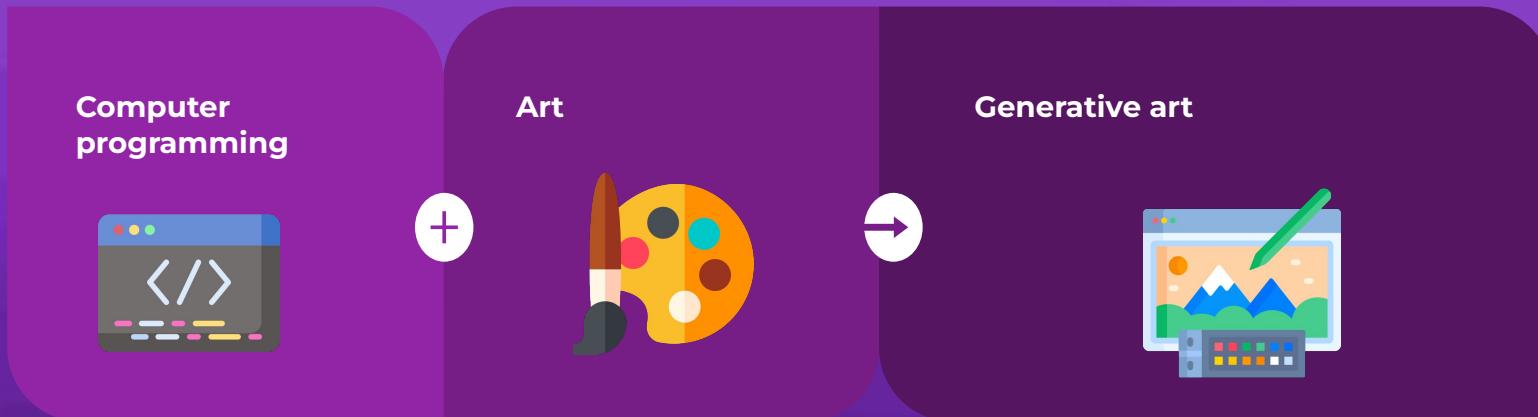
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**Code In Art Out**

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# INTRODUCTION

- A webapp for rendering generative art
- Free to use
- A Collection of 32 artworks to interact with



# Objectives

Increase creativity



Visualize concepts from maths and  
science



Introduce generative art algorithms



Create appealing artworks



# FEATURES



Download, Share  
and Save Arts



Art from  
Template



Art From  
Image



Add Arts to  
Favourites



Customize Art

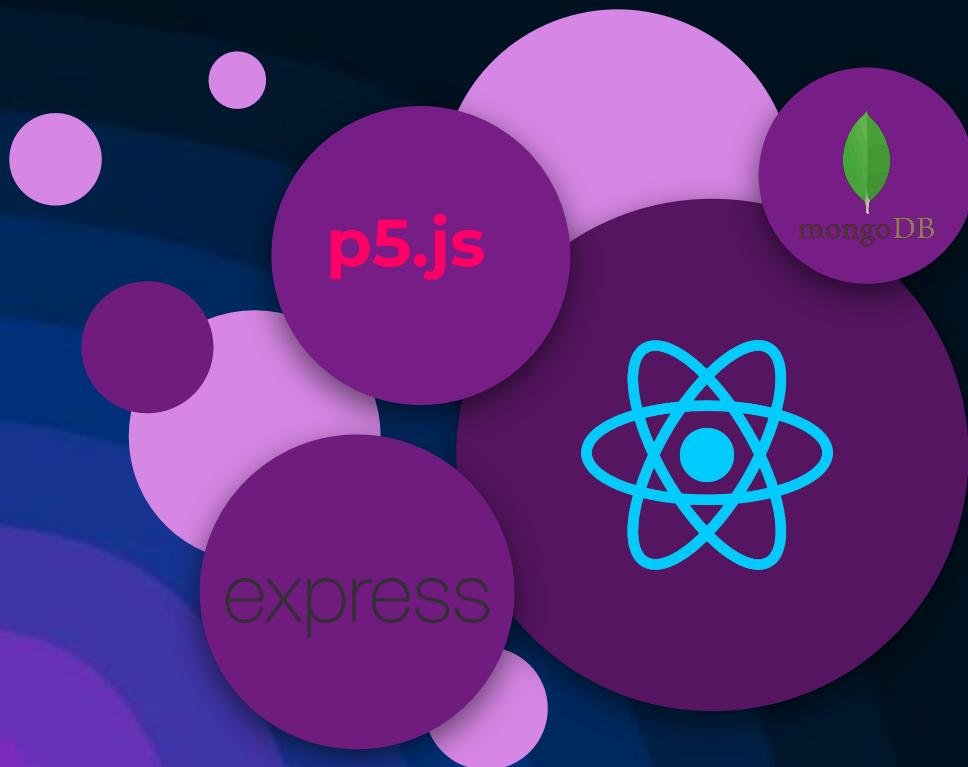
# ART FROM TEMPLATE



# ART FROM IMAGE



# Tools Used



- React
- MongoDB
- Express Js
- p5.js

# Related works

## Silk

online tool for creating symmetrical art, including rotational symmetry

## Repper

user-friendly paid web application that creates beautiful geometric patterns

## ASCII Art Generator

generate images created by converting an existing image to Ascii characters

## Acrylicode

web application which automatically creates generative art using a drawing harmonization tool

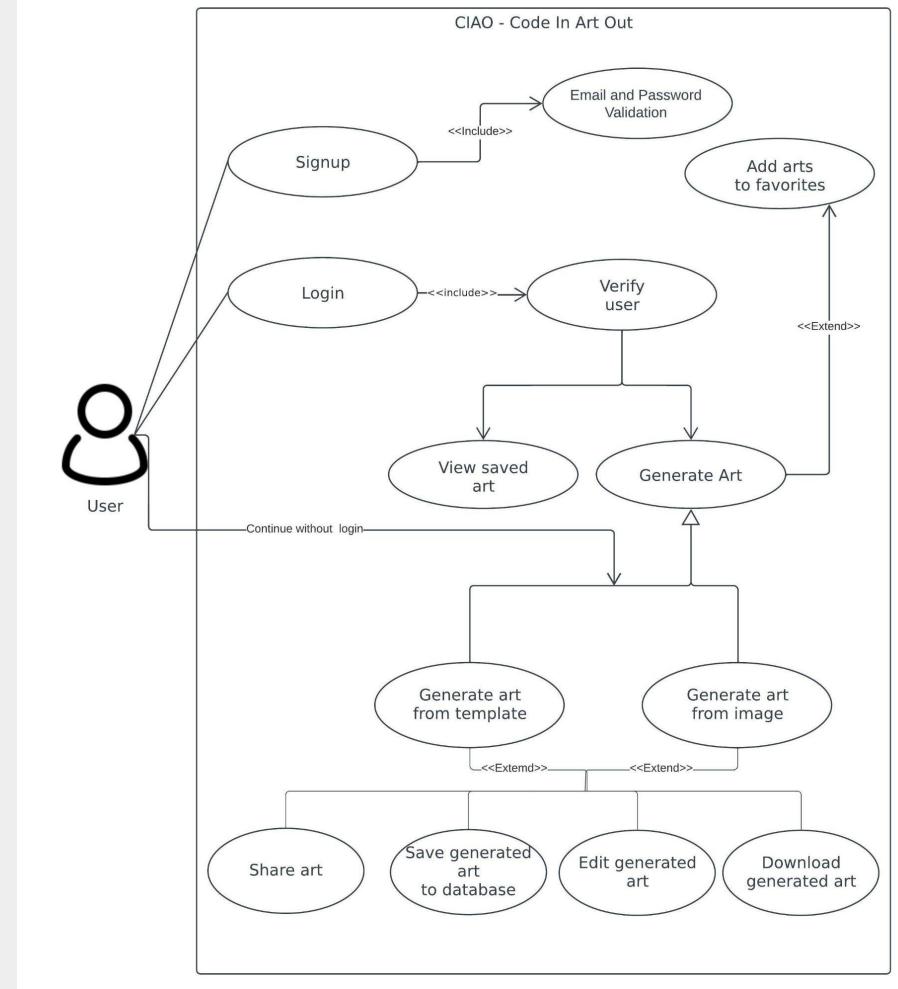


# Website workflow

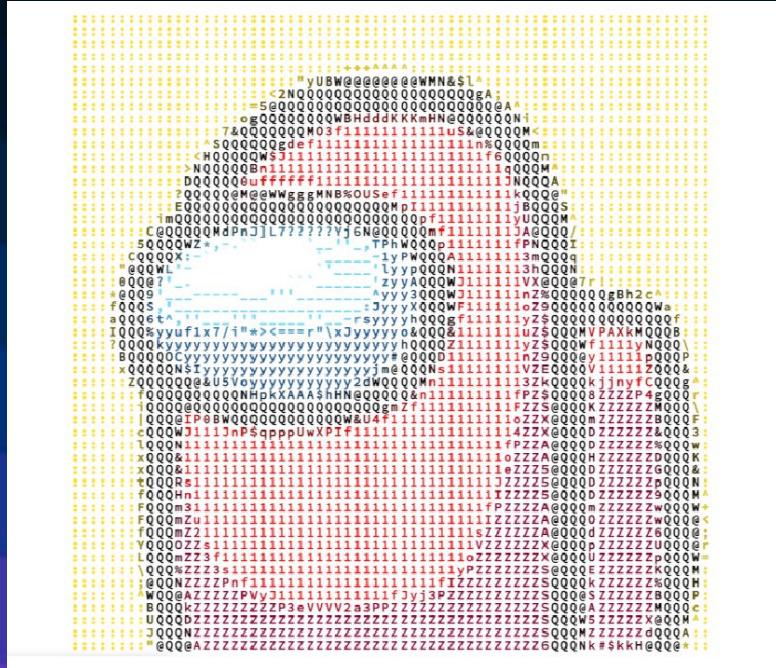
## User :

- **Sign up**
  - Email and password validation
- **Login**
  - User verification
  - Saved and Generate arts
- **Saved arts** <- Add arts to favourites
- **Generate arts**
  - Template and Image
    - Share save edit and download arts

(User restricted to share, save and download arts unless they are logged in)



# Exploring some of our arts



# ASCII art

## Perlin noise flow field

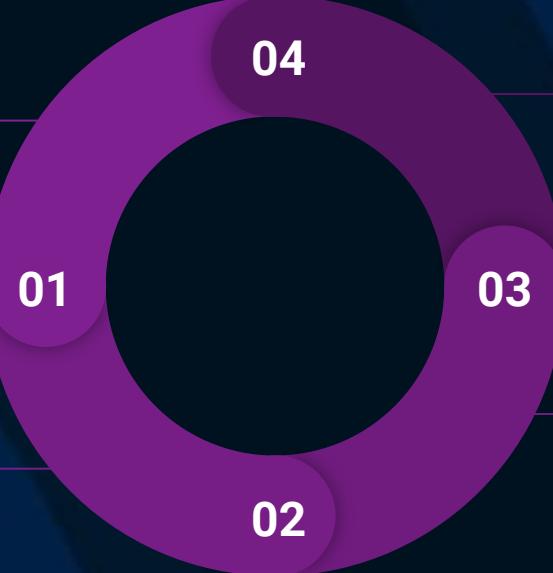
# ASCII Art

**Load image to access pixel array**

The pixel array contains the rgb value of each pixel of the image.

**Calculate brightness of each pixel**

The brightness value is calculated by the average of r,g and b value of each pixel



**Create div of ASCII character for each row**

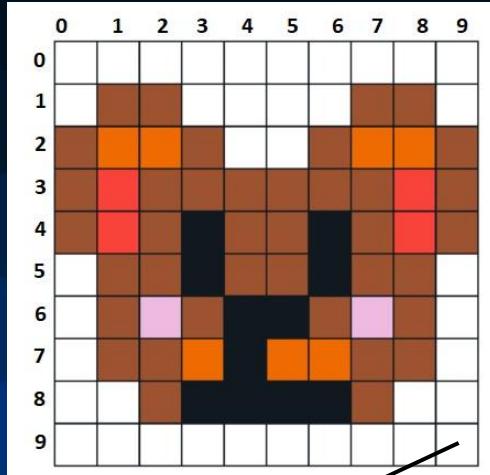
The resulting ascii character is calculated for each pixel in a row by row fashion.

**Map brightness value to an ASCII character**

The brightness value is mapped to an ascii character.

Ñ@#W\$9876543210?!abc;:+=-,\_-

# ASCII Art



$$(9+9*10)*4 = 396$$

$$R = 396$$

$$G = 397$$

$$B = 398$$

$$A = 400$$



```
1 const pixelIndex = (i + j * img.width) * 4;  
2 const r = img.pixels[pixelIndex + 0];  
3 const g = img.pixels[pixelIndex + 1];  
4 const b = img.pixels[pixelIndex + 2];
```

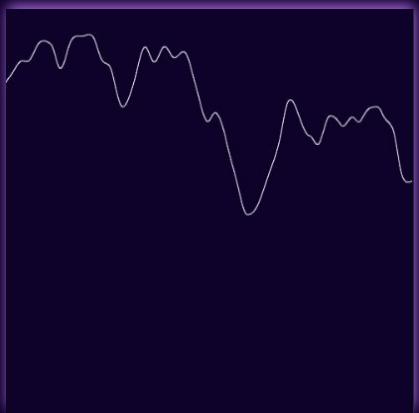


```
1 const density = "Ñ@#W$9876543210?!abc;:+=-,.-_";
```

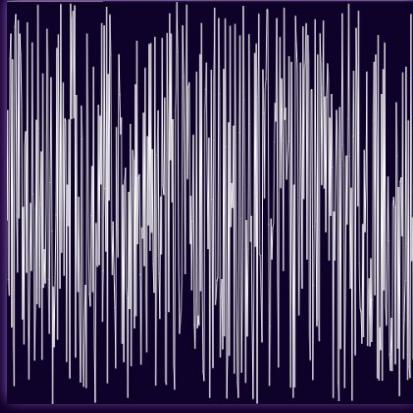


```
1 const avg = (r + g + b) / 3;  
2 const charIndex = floor(map(avg, 0, 255, density.length, 0));  
3 const c = density[charIndex];
```

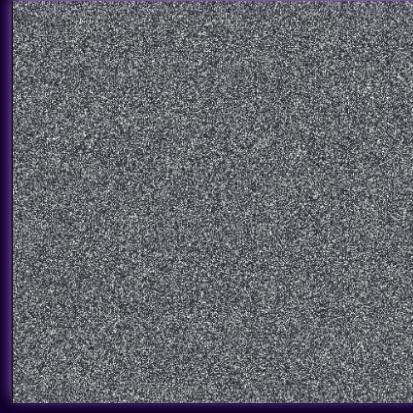
# Perlin Noise



**1D Perlin noise**



**1D Random noise**



**2D Random noise**



**2D Perlin noise**

Perlin noise has a more organic appearance because it produces a naturally ordered ("smooth") sequence of pseudo-random numbers.

# Flow Fields

## Create Particle class

It simulates physics for each particle with parameters like position, velocity, acceleration and methods to update them.

## Create a vector field

A vector field is created to act as force for particles. The magnitude is uniform and the direction is determined by perlin noise.

01

04

02

03

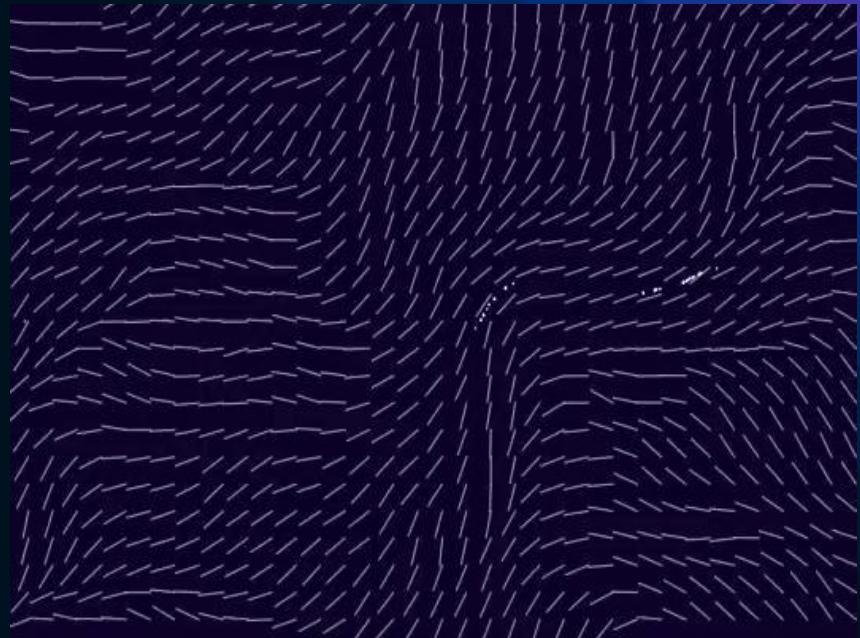
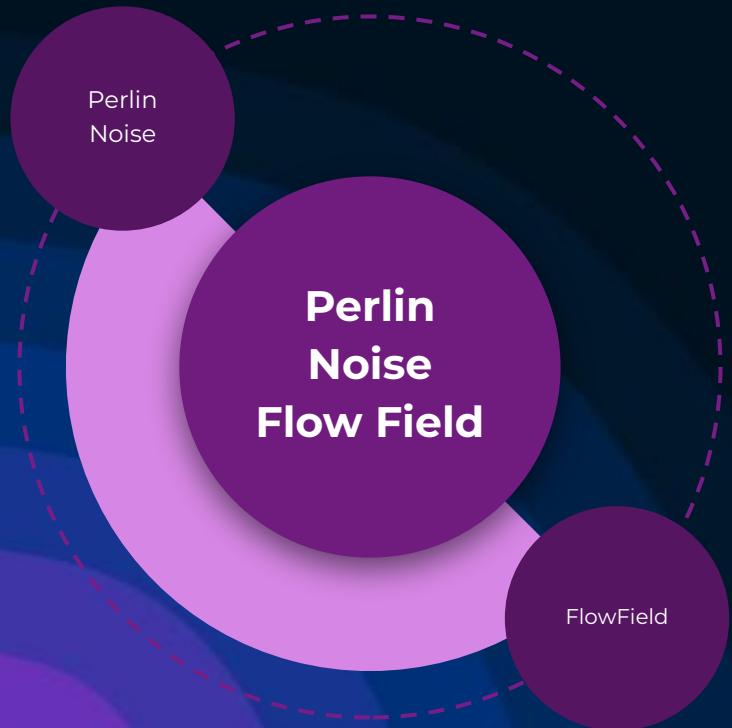
## Draw particles

The particles previous and current position is tracked with each frame and lines are drawn between them

## Simulate particles

1000 particles are added in the vector field and their parameter are calculated with each frame

# Perlin Noise Flow Field



# Limitations and Future Enhancements

01

UI is not responsive on mobile devices.

- Port the webapp to a mobile app using react native
- Using media queries

02

Unable to download arts saved in the cloud.

- Add download button in each art in your arts page.

03

Some saved arts are different than the original

- Save the randomly generated values in the database as well

Thank  
You

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