



# **SUDOKU SOLVER**


**USING COMPUTER VISION**

**GROUP 11**  
**MM.ARSATH**  
**19/ENG/006**





# CONTENT

- 
- 01** INTRODUCTION
  - 02** APPROACH OVERVIEW
  - 03** CODE STRUCTURE
  - 04** DEMONSTRATION
  - 05** CONCLUSION
  - 06** REFERENCES

# INTRODUCTION



Image to Puzzle



Solve the Puzzle

# APPROACH OVERVIEW

## 1. Image preprocessing

- Input image is read and processed to find the Sudoku Board
- Perspective Transform is applied

## 2. OCR (Optical Character Recognition)

- Split the board to individual cells and preprocess them for OCR
- A pretrained OCR model is used to predict the digit

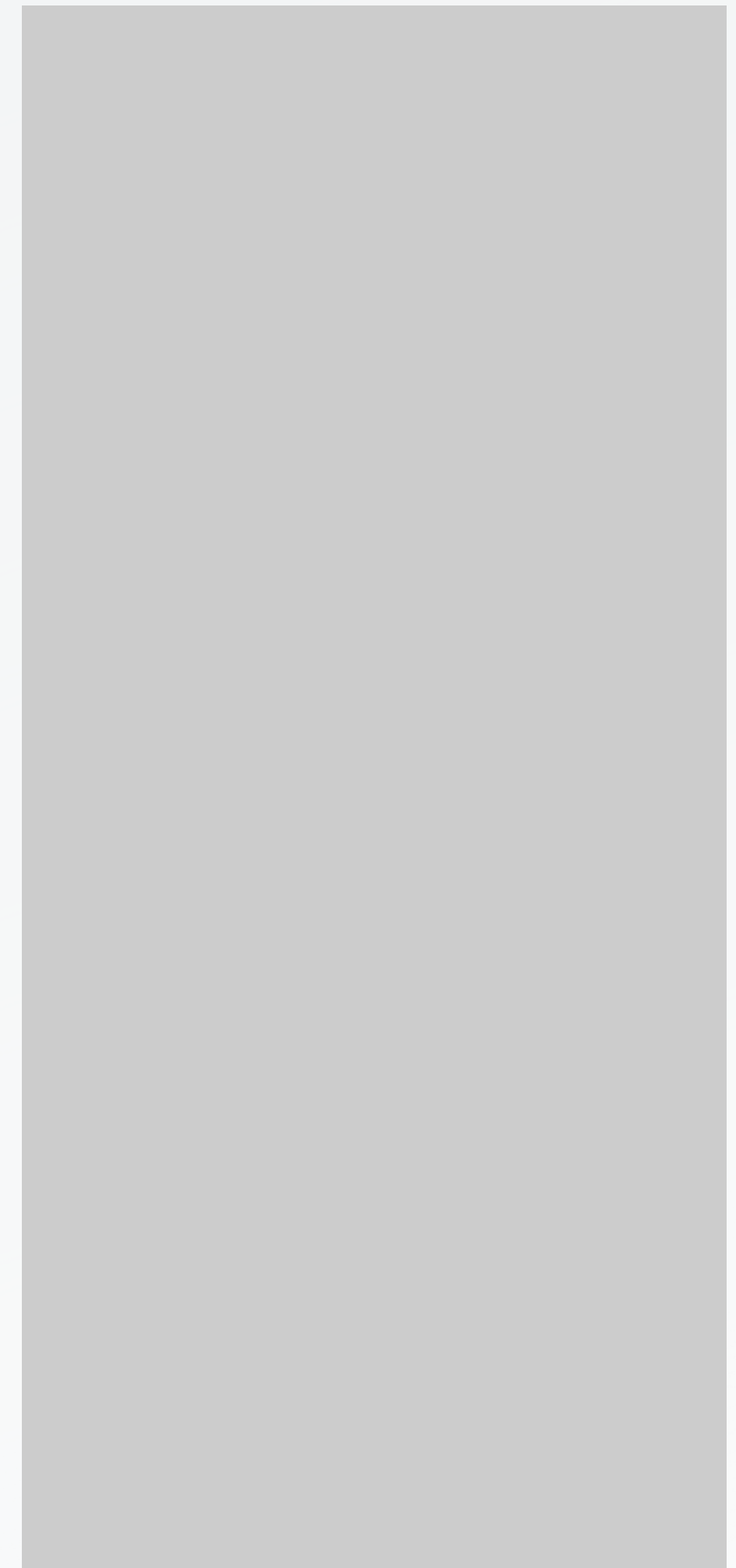
## 3. Sudoku Grid Preparation

- Detected numbers are organized into a 2D array.
- Empty Cells are converted as 0's

## 4. Solving

- Backtracking Algorithm is used
- Optimizing Techniques are used

## 5. Output



# CODE STRUCTURE

1. **Read and Load the OCR model**
2. **Image Reading and Board Detection (find\_board function)**
  - find\_board function convert image to gray scale
  - Apply Gaussian Blur and Adaptive threshold to create binary image
  - Find Contours and iterate
  - If a quadrilateral with four corners is found, it represents the location of the Sudoku board.
3. **Perspective Transformation (get\_perspective function)**
  - Extract the sudoku board as a rectangular image.
4. **Splitting board into cells (split\_boxes function)**
5. **OCR Prediction (predict\_numbers function)**
6. **Identifying empty cells and filling with zeros (find\_empty\_cells & fill\_empty\_cells)**
7. **Converting to 2D array (convert\_to\_2d\_array function)**
8. **Sudoku Solving (solve\_sudoku & co functions)**
9. **Output and file writing**



# DEMONSTRATION

# CONCLUSION

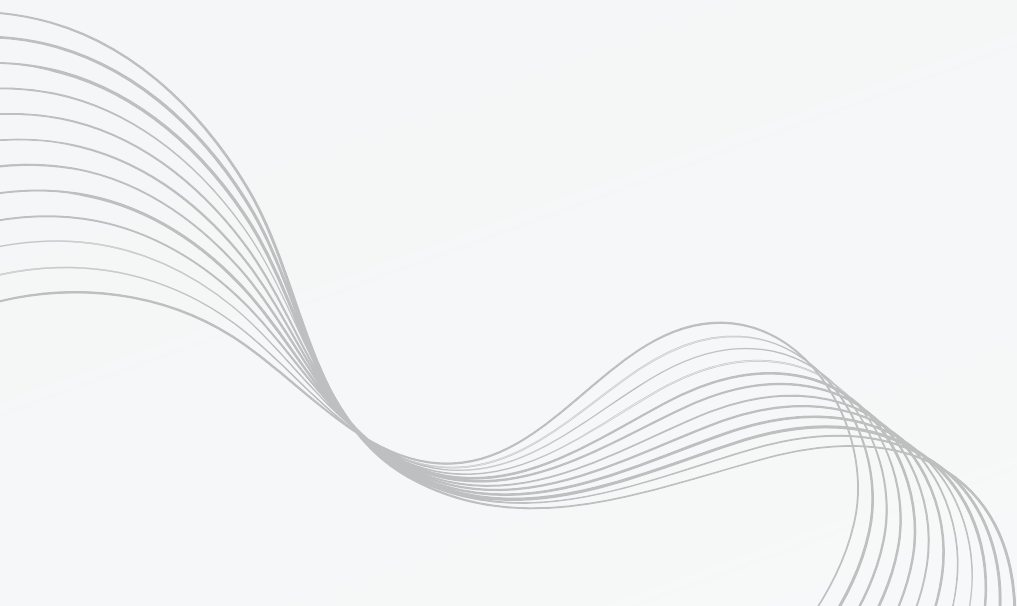
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**THANKS**



**QUESTIONS?**