🧠 Class Notes: Face Detection & Emotion Recognition using PictoBlox (Block Coding)

🎯 Objective of the Project:

To detect faces using a camera and recognize facial expressions such as **happy, sad, angry, neutral, surprised, fear, or disgusted**, and display corresponding messages using the `say` block.

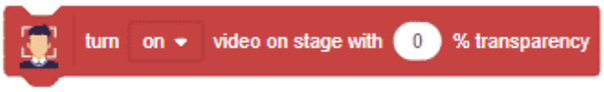
🧱 Block-by-Block Explanation

✅ `when Green Flag clicked`

- Starts the script when the green flag is clicked.
- This is the **starting point** for every PictoBlox program

📷 `turn on video on stage with 0% transparency`

- This block turns **ON your webcam** so the camera feed is visible on stage.
- `0% transparency` means the camera feed will be completely visible.

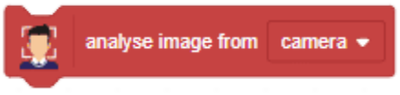


🔁 `forever`

- This block **loops everything inside it forever**, so it keeps checking for faces and emotions in real-time.

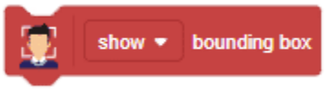
🧠 `analyse image from camera`

- Analyzes the **current camera frame** to detect faces and expressions.
- This is the **key step** for any face or emotion detection.



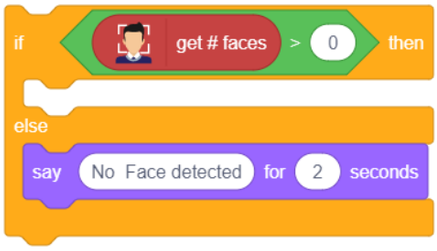
🔲 `show bounding box`

- Displays a **box around the face(s)** that are detected.
- Helps users visually verify that the face detection is working.



🕵️ `if get # faces > 0 then`

- This checks if **at least one face** is detected by the camera.
- If true, it continues to analyze facial **expressions**.
- If no face is detected, it goes to the **`else`** block.



🔍 Expression Detection Logic (inside the `if`)

📜 `is expression of face 1 = ...`

This block checks **what kind of expression** is shown on the first face detected:

- `c`

💬 `say ... for 2 seconds`

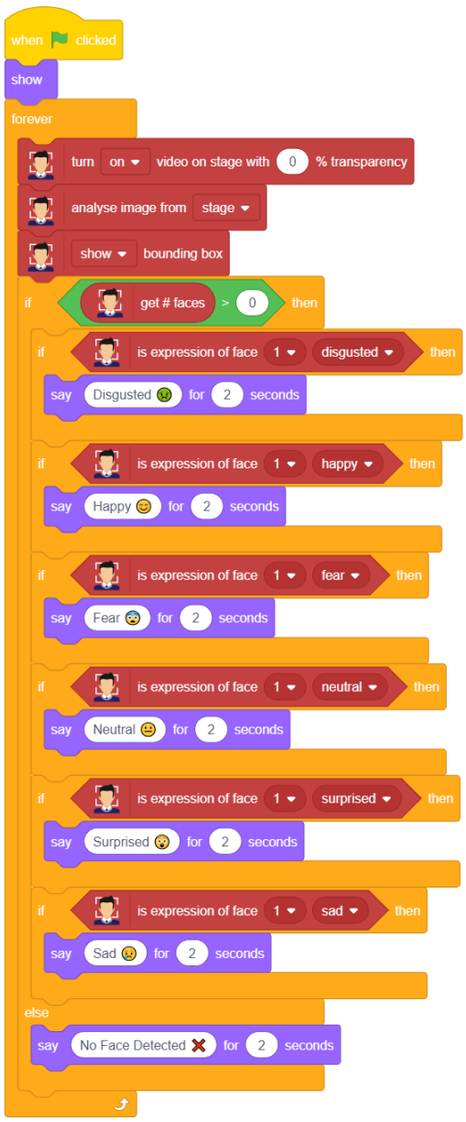
- Based on the expression detected, the sprite will **speak the emotion** out loud for 2 seconds.

❌ `else say No Face detected for 2 seconds`

- If no face is detected, the sprite will say: **“No Face detected”**
- This helps the user understand that the camera is not seeing any face at the moment.

🧠 Summary Flow:

1. Start the camera and show on stage.
2. Keep checking for faces in a loop.
3. If a face is detected:
    - Identify the expression.
    - Show and say the emotion.
      If no face is detected:
    - Say “No Face Detected”.



💡 Learning Outcomes

By the end of this project, students will learn:

- How to use the **camera** in PictoBlox.
- How to apply **face detection and emotion recognition**.
- How to use **conditional blocks (`if`, `else`)** to control logic.
- Real-world application of **AI in emotion detection**.

🧪 Additional Task (Optional for Practice)

- Display emojis based on detected emotions.
- Play different sounds for each emotion.
- Add multiple sprites reacting to different emotions.