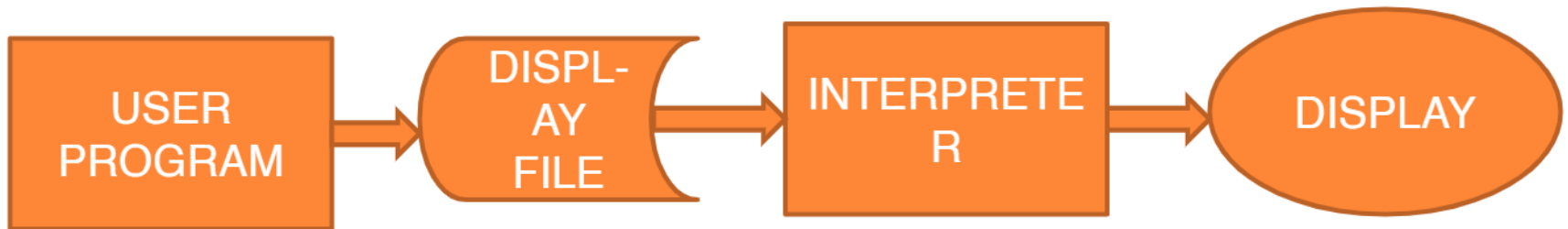# DISPLAY FILE INTERPRETER

o It contain the information necessary to construct the picture.

o The information will be in the form of instructions such as "draw a line" or "move a line".

o Each instructions indicates a MOVE or a LINE, action for the display device.

o We use display file interpreter to convert these instructions into actual images.

DISPLAY FILE AND INTERPRETER

USER PROGRAM → DISPLAY FILE → INTERPRETER → DISPLAY

FEATURES:

- Portability

- Interpreter converts standard display instructions to the actions of the particular device.

- Such files of imaging instructions are called as metafiles

Normalized device coordinates:

- Different display devices may have different screen sizes as measured in pixel.

- The device independent units are called normalized device coordinates.

- In these units the screen measures 1 unit wide and 1 unit height.

DISPLAY FILE STRUCTURE

Each display file consists of two parts.

- Operation code (opcode) :- It indicates what type of command it is (e.g. LINE or MOVE).
- Operand :- They represent the coordinates of a point (x,y).

To store the instruction we use three separate arrays.

- ➤ One for the operation code (DF-OP).
- ➤ One for the X- coordinate (DF-X).
- ➤ One for the Y- coordinate (DF-Y).

The Display must be large enough to hold all the commands needed to create our image.

Display File Algorithms

- This algorithm is for our display file interpreter.
- The interpreter will read the instructions from the portion of the display file and carry out the appropriate LINE or MOVE commands.

- ALGORITHM **DOMOVE(X,Y):**
- Arguments   X,Y (Point to which to move).
- Global   FRAME-PEN-X , FRAME-PEN-Y.
       (Actual screen coordinates).
-       WIDTH,HEIGHT .
        (the screen dimensions)
-       WIDTH-START,HEIGHT-START.
      (coordinates of the lower-left corner).
-       WIDTH-END,HEIGHT-END.
       (Coordinates of the upper right corner).

- **BEGIN**
  - FRAME-PEN-X <-   MAX(WIDTH-START,
                        MIN(WIDTH-END,
                        X*WIDTH+WIDTH-START));
  - FRAME-PEN-Y <-   MAX(HEIGHT-START,
                        MIN(HEIGHT-END,
                        Y*HEIGHT+HEIGHT-START));

  RETURN;

  END;

In this algorithm we see the formula for converting the normalised coordinates values of arguments into actual screen coordinates.

The MAX,MIN functions have been added to formula because they prevent it from ever generating a value outside the bonds of the actual display.

Display control

- In order to show the picture describe in the display file, we might have to do three things
  - To clear the current display.
  - To interpret the display file.
  - On some devices an explicit action is requierd to show the content of the frame buffer on some devices(eg. Line printer and standard CRT terminals).

  It is not necessary to clear the display everytime we interpret the display file .

  Sometimes we just have to make some additions in the image so there is no need to clear the image and redraw it again.

Contd:

- We handle clearing of the frame by using a flag. We use a true value to indicate that the screen should be cleared and false value to mean that the display file instruction may be drawn on top of the old image.