

**“UNIVERSIDAD NACIONAL DE SAN AGUSTIN”**

**FACULTAD:**  
**INGENIERÍA DE PRODUCCIÓN Y SERVICIOS**

**ESCUELA PROFESIONAL:**  
**“CIENCIA DE LA COMPUTACIÓN”**



**TEMA:**

Laboratorio 04

**CURSO:**

Tópicos en Computación Gráfica

**DOCENTE:**

Yessenia Deysi Yari Ramos

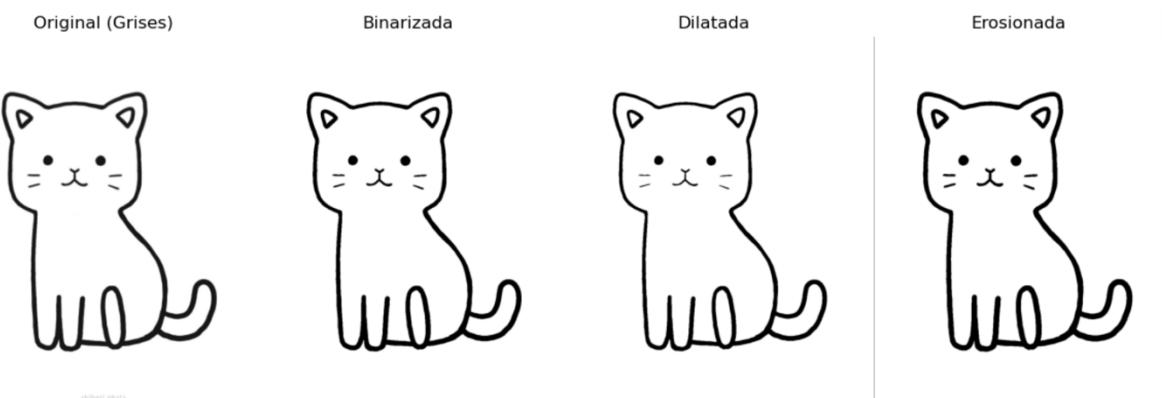
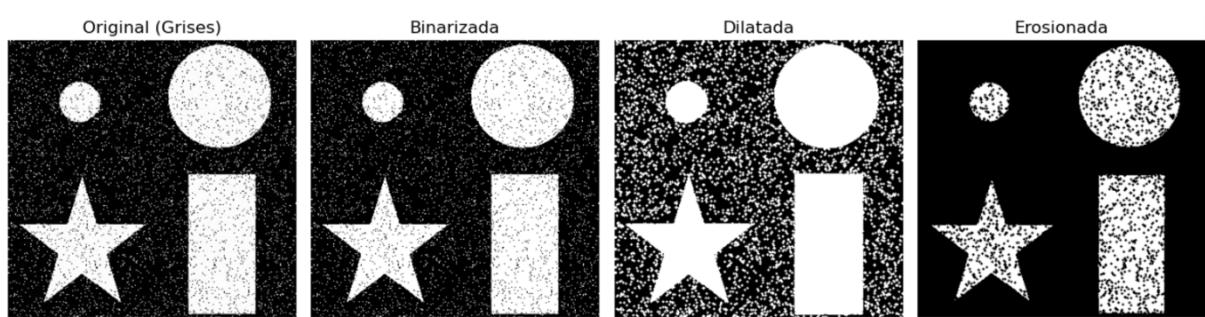
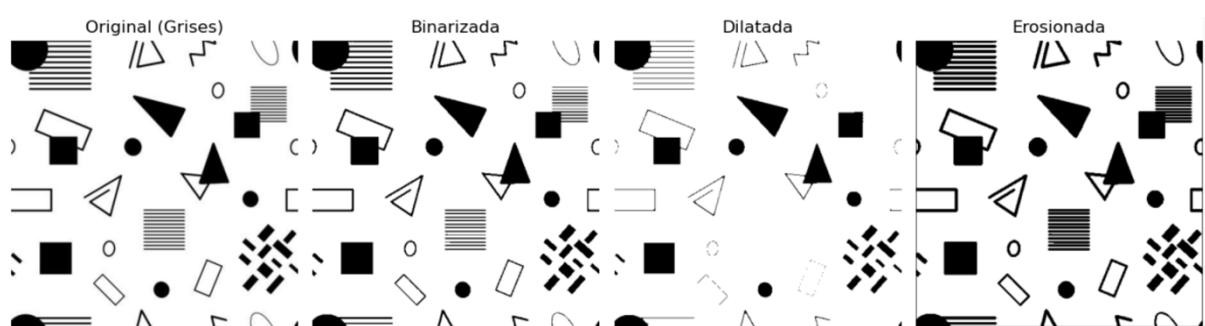
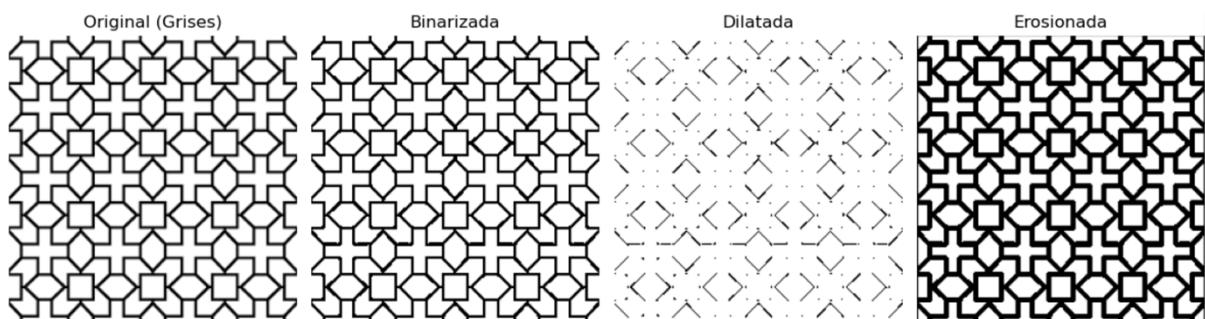
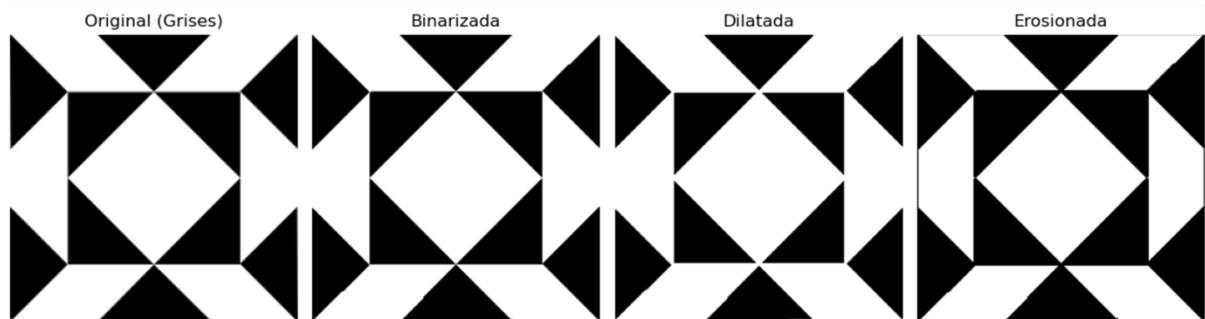
**ESTUDIANTE:**

Ancel Alain Fernando Cruz Chaiña

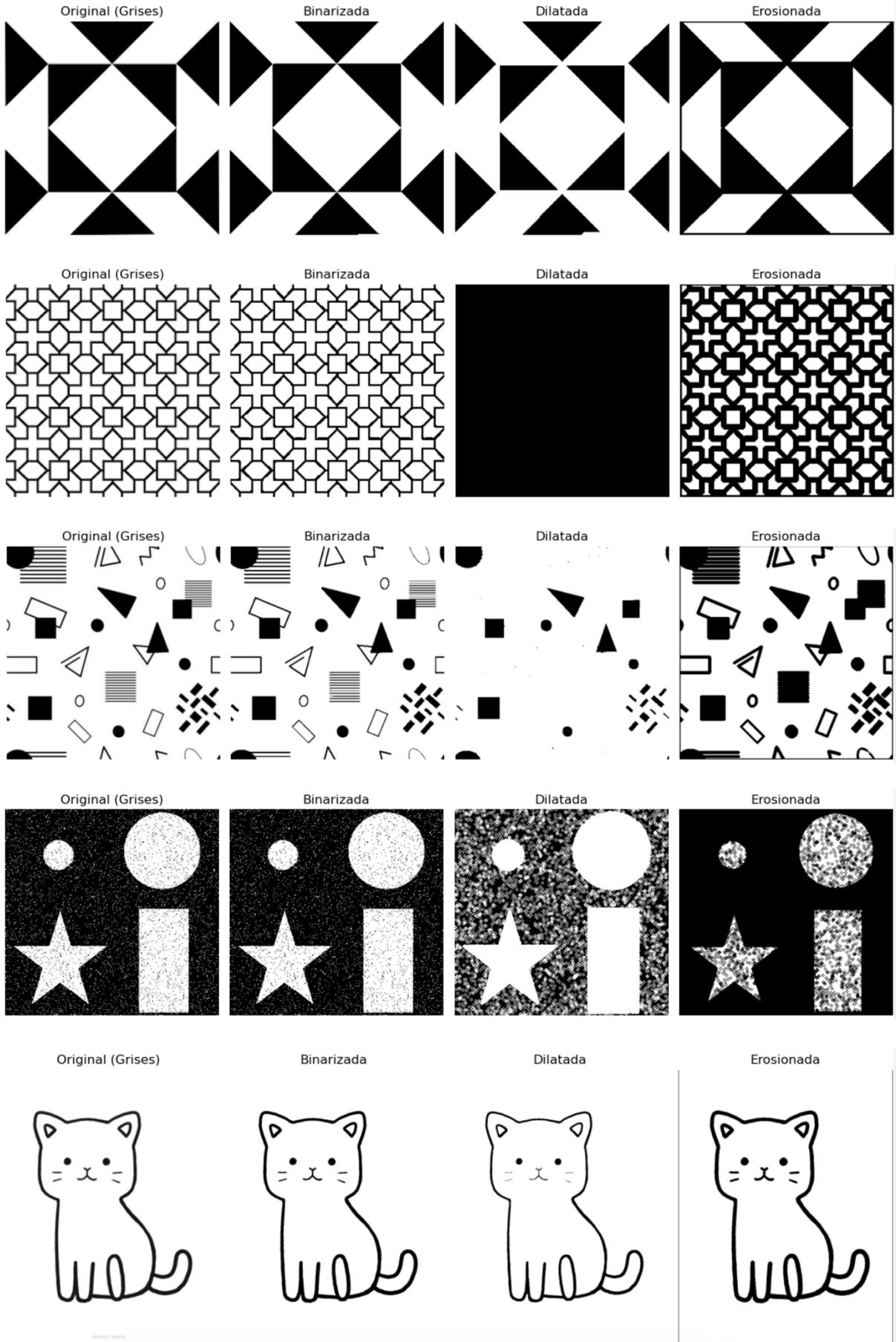
**AREQUIPA-PERÚ**

## RESULTADO POR CADA IMAGEN

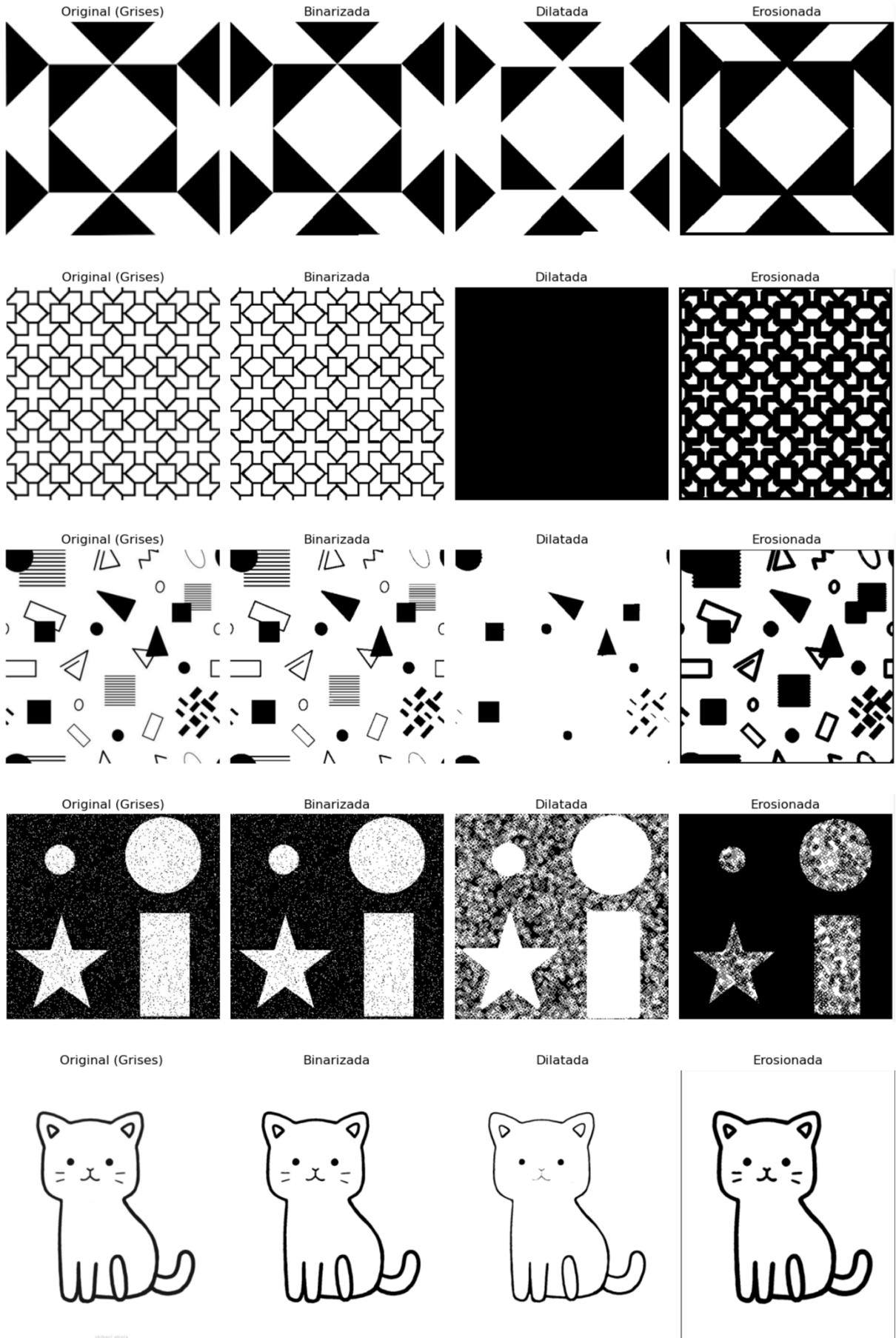
### 1. (FILTRO 3X3)



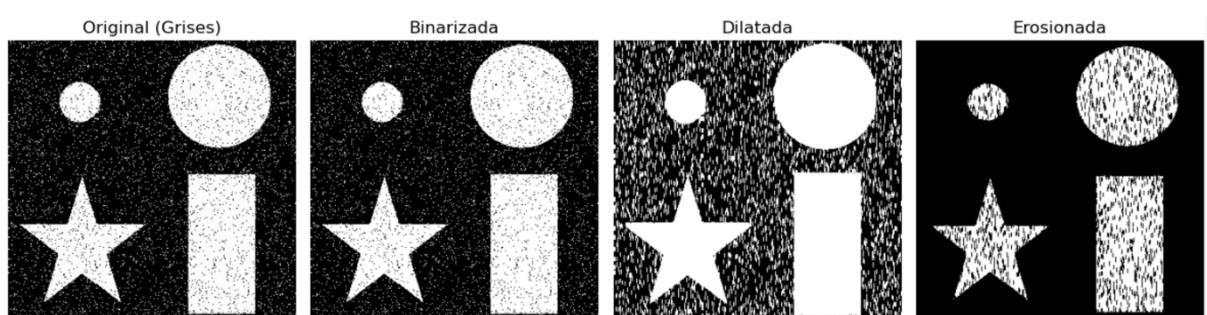
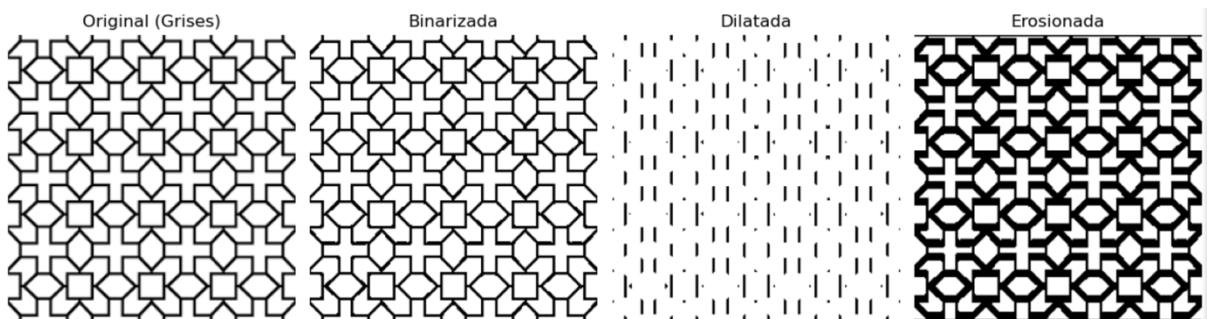
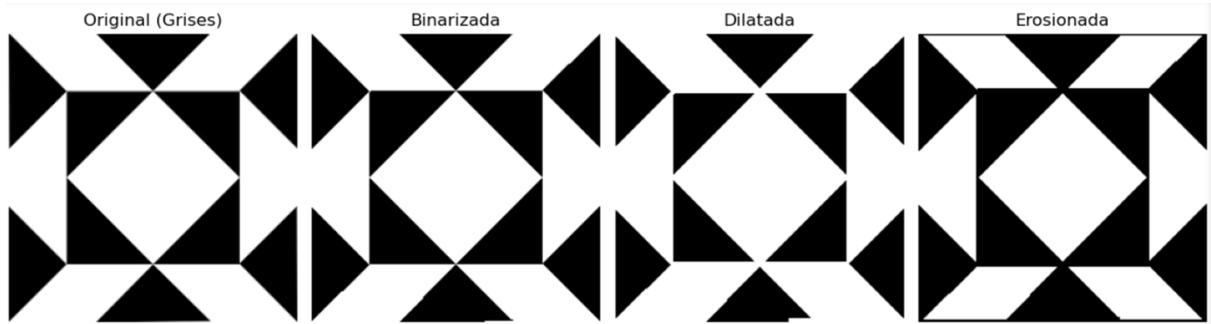
## 2. (FILTRO 5X5 DIAMANTE)



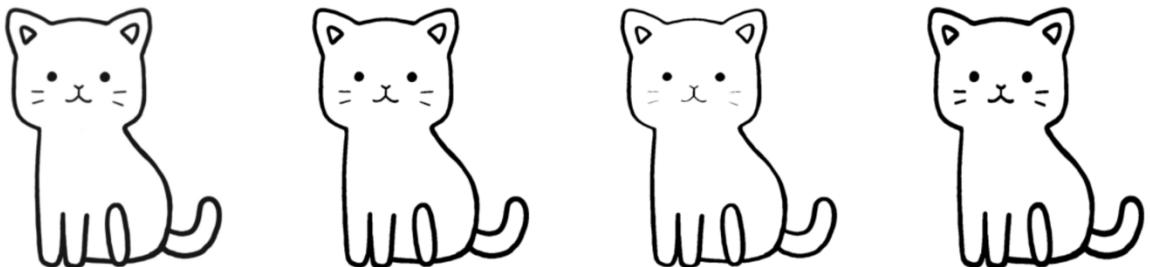
### 3. (FILTRO 7X7 DIAMANTE)



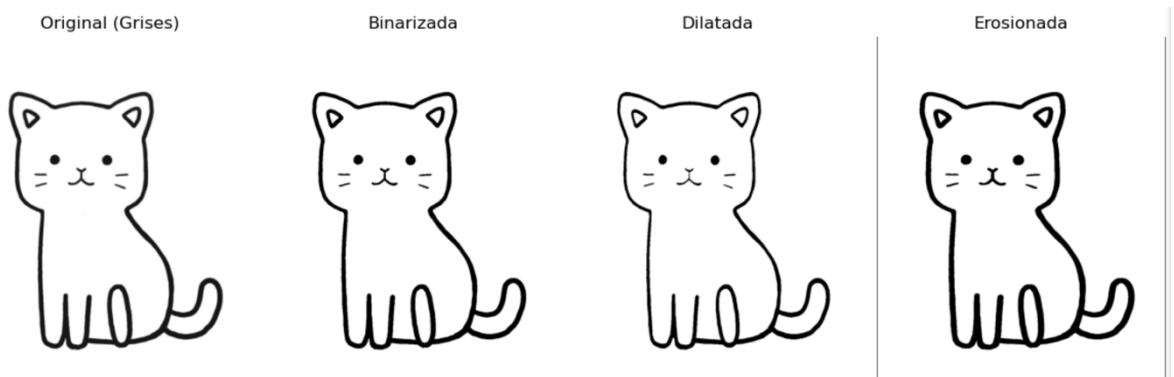
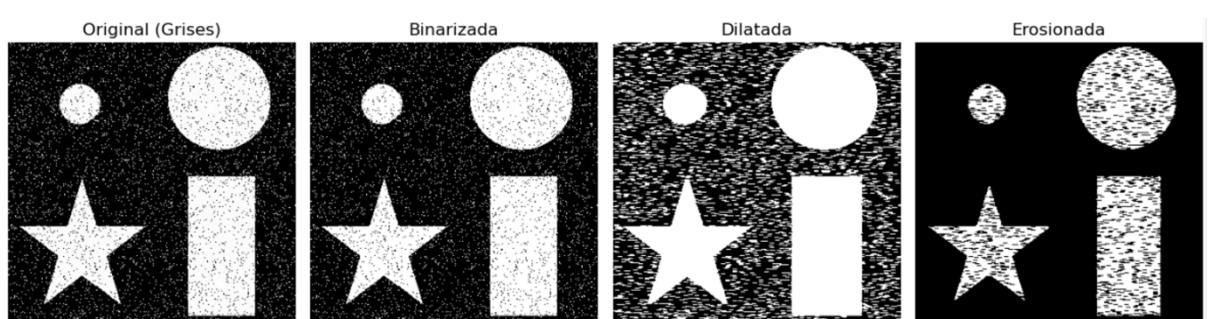
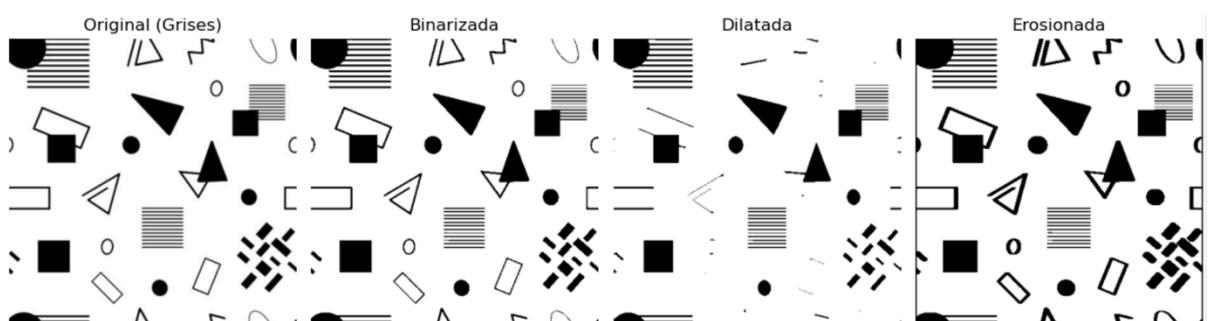
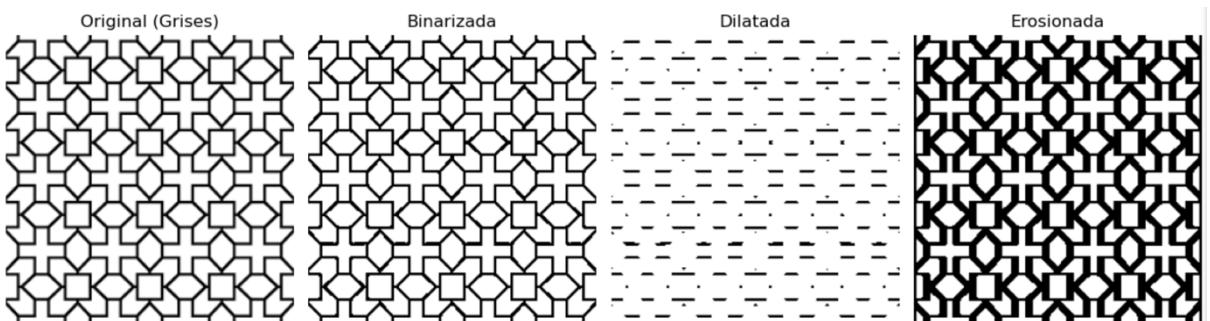
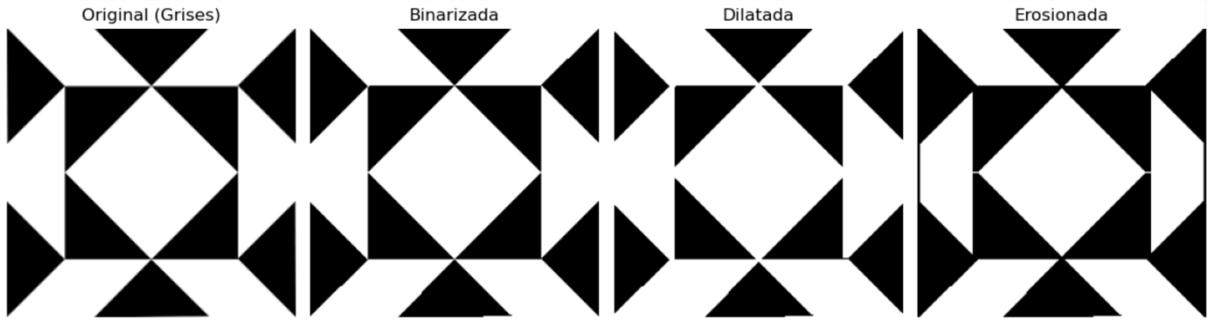
#### 4. (BARRA VERTICAL (5))



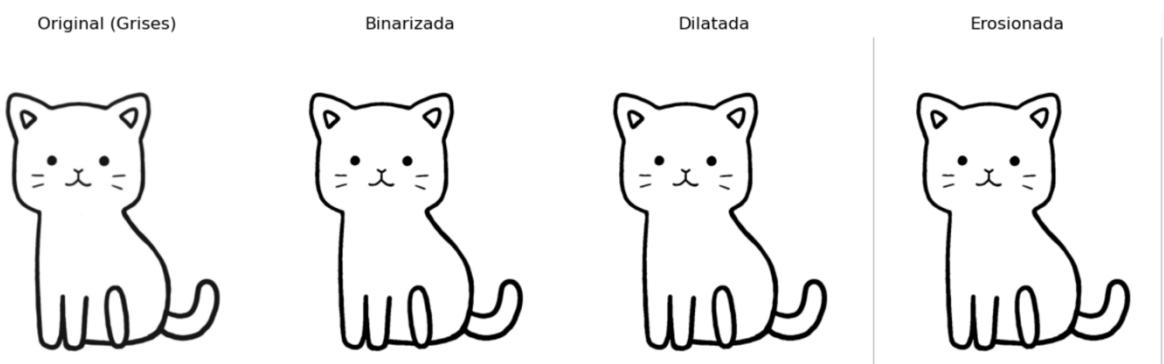
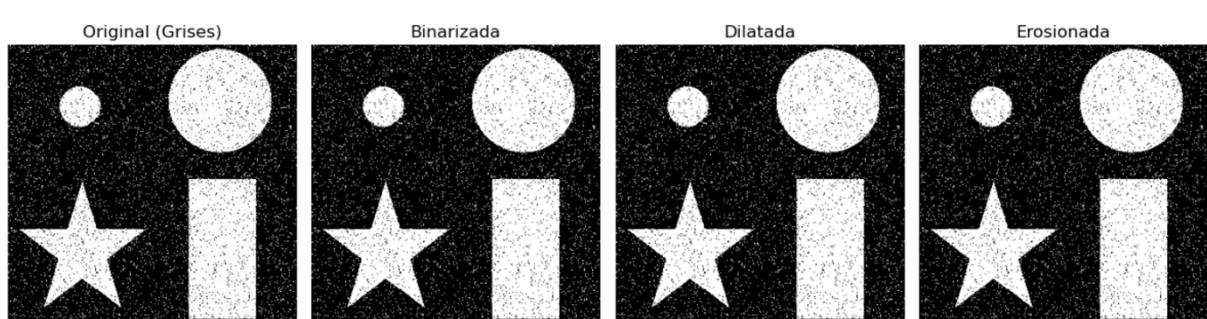
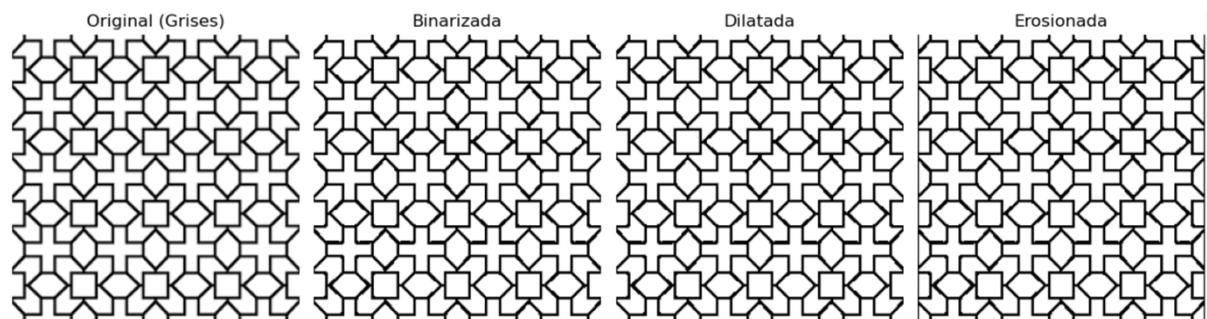
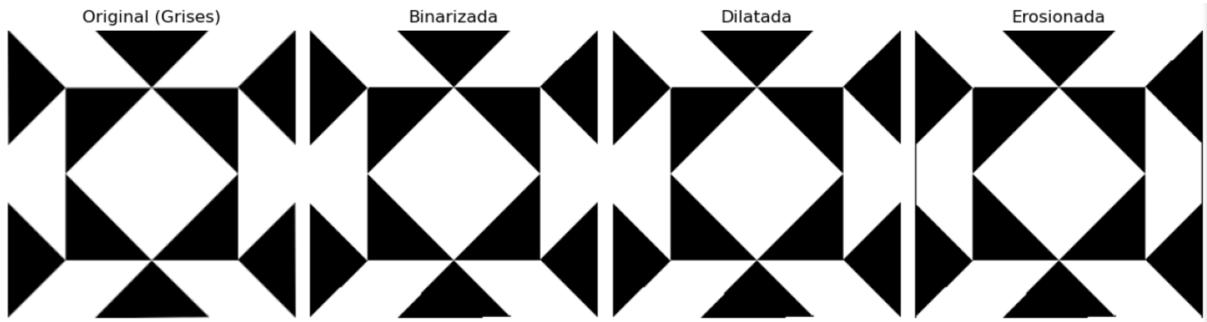
Original (Grises)      Binarizada      Dilatada      Erosionada



## 5. (BARRA HORIZONTAL (5))



## 6. (BLACK WHITE BLACK)



## ANEXO:

- El orden de las imágenes fueron cargados de la siguiente forma: (lista).

```
[10]: imagenes = [
    "../imagenes/blancoNegro.png",
    "../imagenes/figuraV.png",
    "../imagenes/figuraV2.jpg",
    "../imagenes/figures.jpg",
    "../imagenes/gato1.jpg",
]
```

- Los valores de los siguientes filtros son los siguientes (formato np).

```
*[41]: # Cruz 3x3
cruz_3x3 = np.array([
    [0, 1, 0],
    [1, 1, 1],
    [0, 1, 0]
], dtype=np.uint8)

# Diamante 5x5
diamante_5x5 = np.array([
    [0, 0, 1, 0, 0],
    [0, 1, 1, 1, 0],
    [1, 1, 1, 1, 1],
    [0, 1, 1, 1, 0],
    [0, 0, 1, 0, 0]
], dtype=np.uint8)

# Diamante 7x7 (corregido para que sea 7x7 real)
diamante_7x7 = np.array([
    [0, 0, 0, 1, 0, 0, 0],
    [0, 0, 1, 1, 1, 0, 0],
    [0, 1, 1, 1, 1, 1, 0],
    [1, 0, 1, 1, 1, 0, 1],
    [0, 1, 1, 1, 1, 1, 0],
    [0, 0, 1, 1, 1, 0, 0],
    [0, 0, 0, 1, 0, 0, 0]
], dtype=np.uint8)

# Barra vertical (5x1)
barra_vertical = np.array([
    [1],
    [1],
    [1],
    [1],
    [1]
], dtype=np.uint8)

# Barra horizontal (1x5)
barra_horizontal = np.array([
    [1, 1, 1, 1, 1]
], dtype=np.uint8)

# Patrón BlackWhiteBlack (1x3)
black_white_black = np.array([
    [0, 1, 0]
], dtype=np.uint8)
```