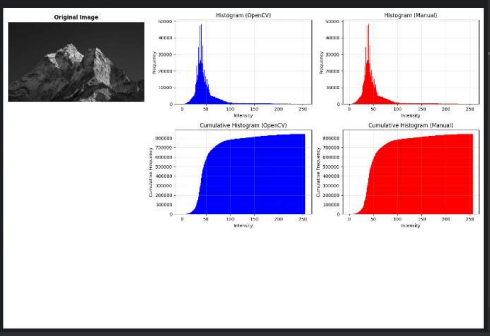
image1.py

```
    cumhist_manual = manual_cumulative_histogram(hist
    print("✓ Cumulative histogram computed using Manual implementation")

    # ============================================================
    # PART 3: HISTOGRAM EQUALIZATION
    # ============================================================
    print("\n" + "=" * 60)
    print("STEP 4: PERFORMING HISTOGRAM EQUALIZATION")
    print("=" * 60)

    equalized_opencv = cv2.equalizeHist(image)
    hist_eq_opencv = cv2.calcHist( images: [equalized_opencv], channels: [
    print("✓ Histogram equalization performed using OpenCV")

    equalized_manual = manual_histogram_equalization(image)
    hist_eq_manual = manual_histogram(equalized_manual)
```

Plots

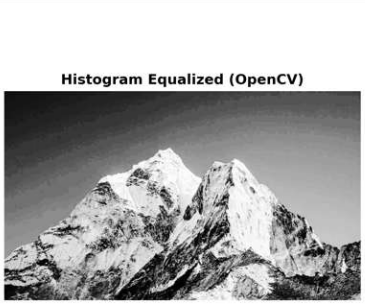
1:1 1,500x1,000 PNG (32-bit color) 171.89 kB

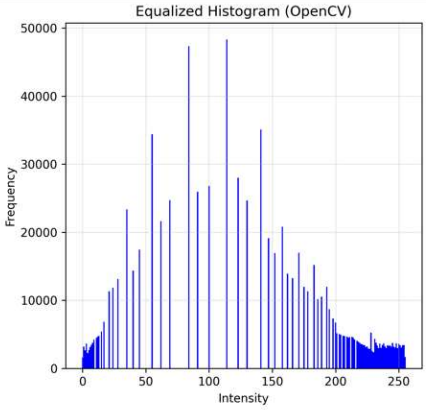


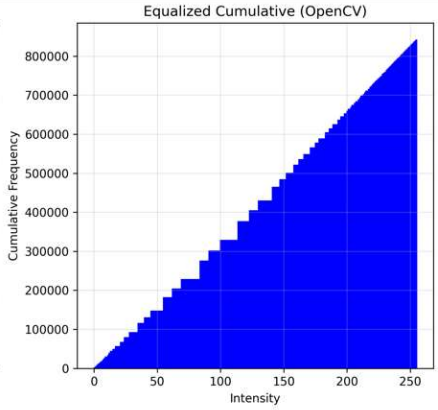
0 1 2 3

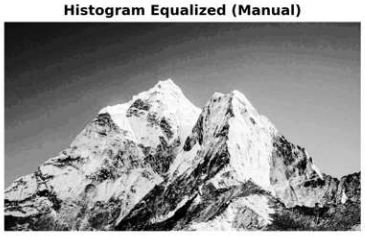
image1

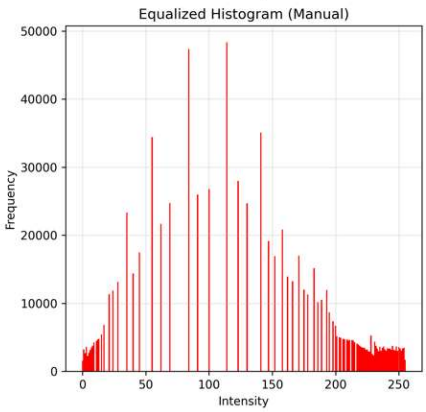
```
  4. 4_comparison_all_methods.png

Thank you for using this program!
============================================================

Process finished with exit code 0
```

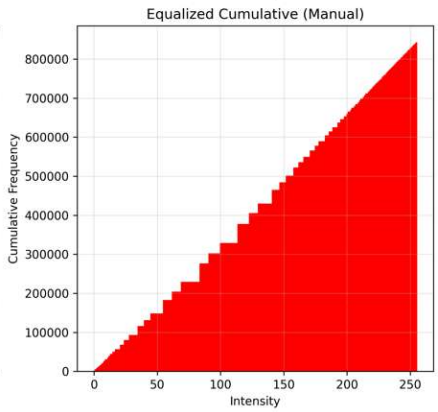




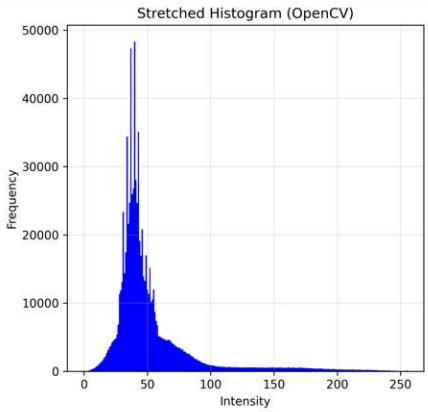


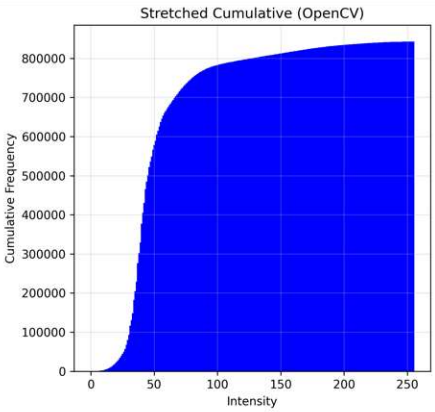




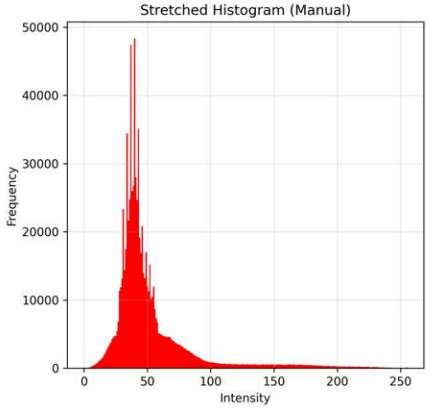


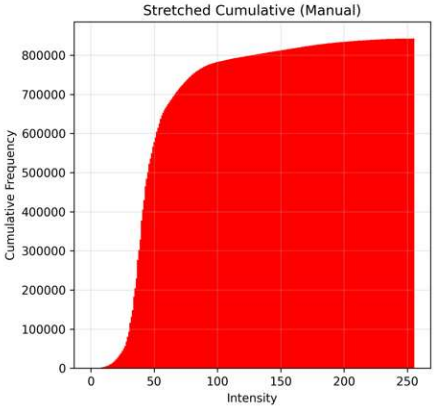

Contrast Stretched (OpenCV)


Stretched Histogram (OpenCV)
Frequency
Intensity

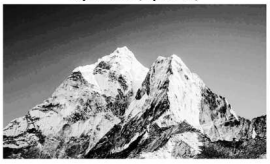

Stretched Cumulative (OpenCV)
Cumulative Frequency
Intensity

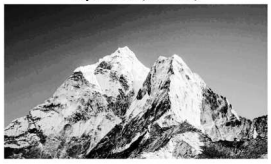

Contrast Stretched (Manual)


Stretched Histogram (Manual)
Frequency
Intensity

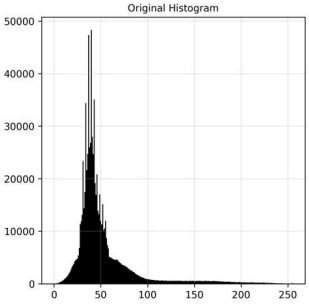

Stretched Cumulative (Manual)
Cumulative Frequency
Intensity

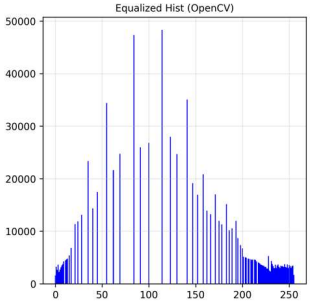

Original

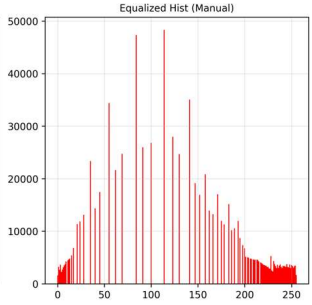

Equalized (OpenCV)

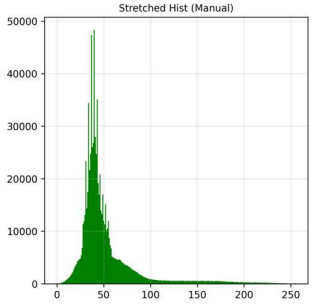

Equalized (Manual)


Stretched (Manual)


Original Histogram


Equalized Hist (OpenCV)


Equalized Hist (Manual)


Stretched Hist (Manual)