HMRF-EM segmentation (WM=red, GM=green, CSF=blue)
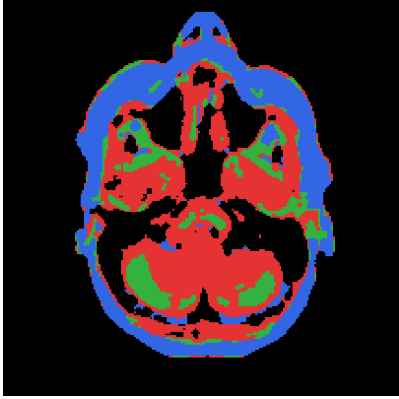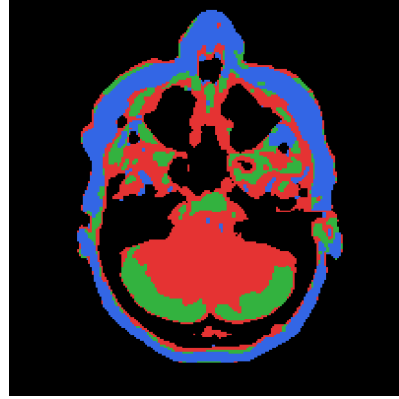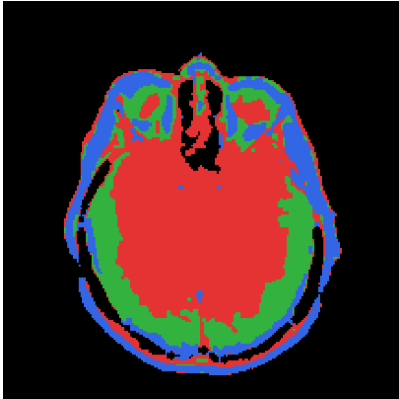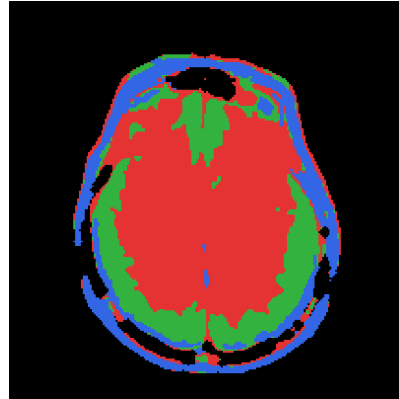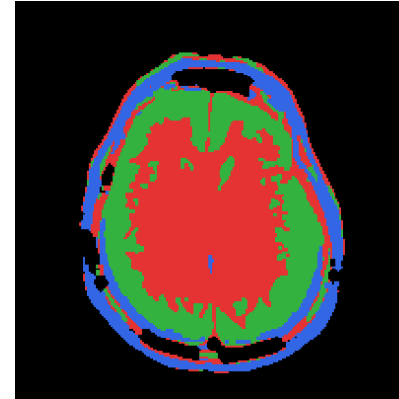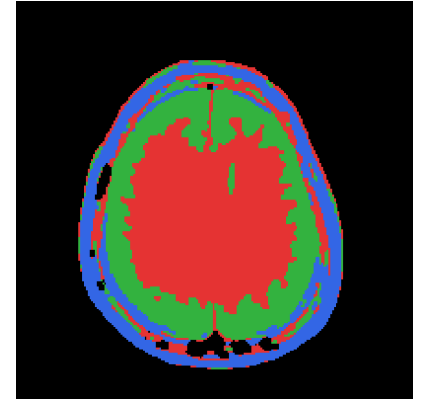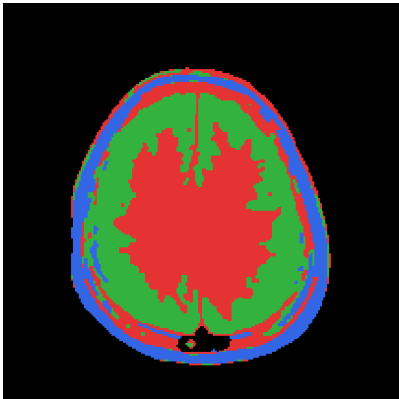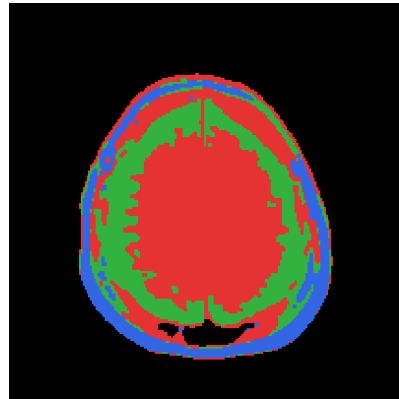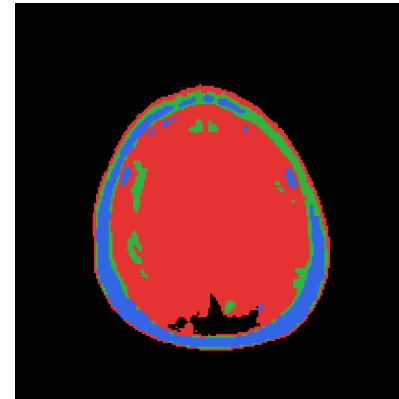
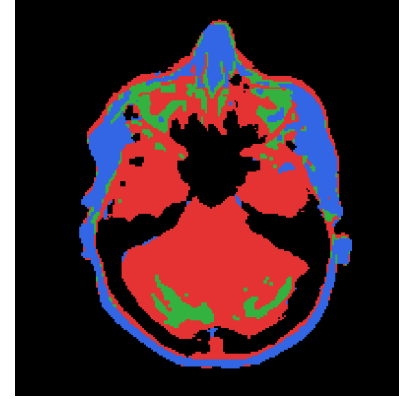# Mid-slice + stats
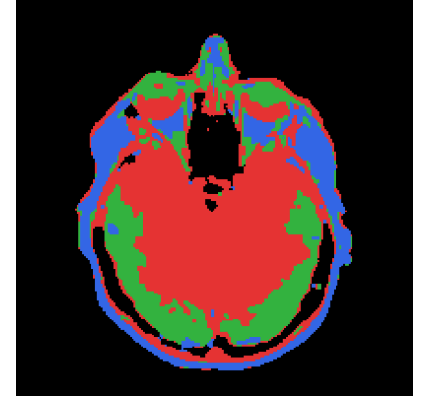

Brain mask (no BG saved) · Mask · Labels overlay — slice 33/64

Class means (sorted T2): WM=0.3427, GM=0.4625, CSF=0.7019
Voxel counts: WM=513,390 (54.8%), GM=228,111 (24.4%), CSF=194,539 (20.8%)

Run Settings & Key Points

Pre-processing

- Normalize intensities (2–98%).
- Denoise: Gaussian σ = 1.0.
- Bias-field correction (homomorphic).
- Skull-strip + morphological cleanup.

Model

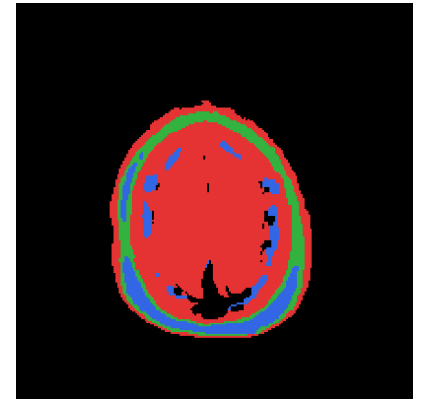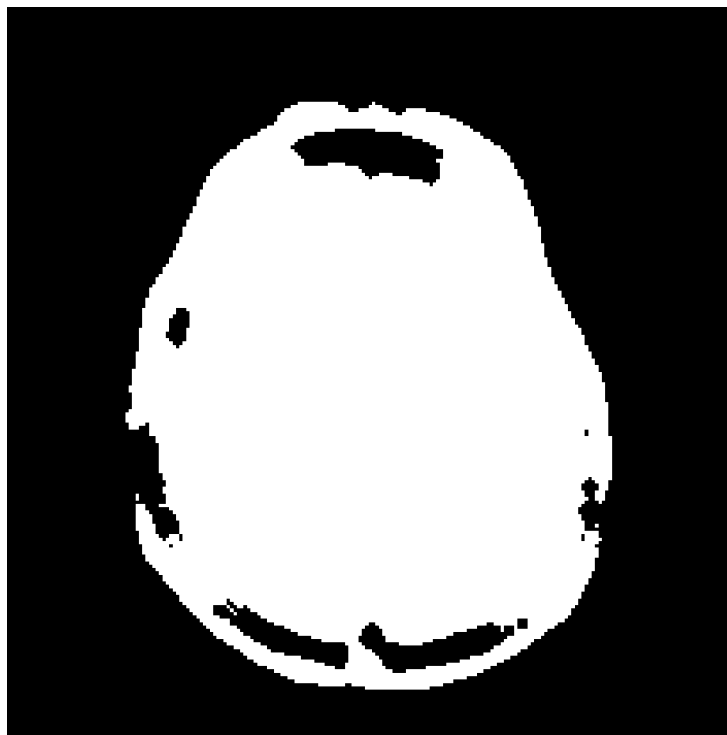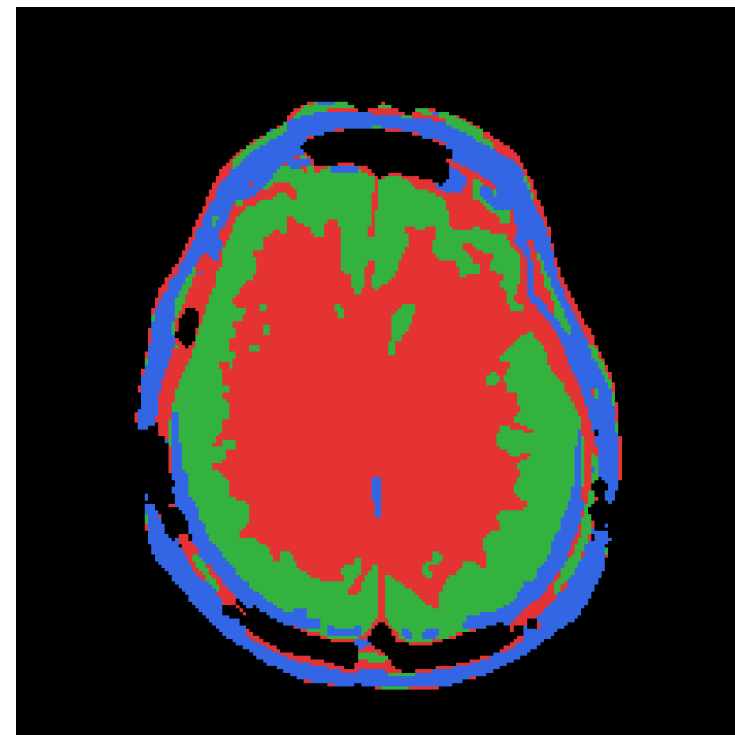- HMRF-EM with Potts prior (β = 1.6).
- Neighborhood: in-plane 4-connected.
- ICM sweeps: 2
- EM iterations: 8

Emissions & Colors

- Gaussian per class (learned μ, σ²).
- Colors: WM = red, GM = green, CSF = blue.

Why it works

- β encourages smooth, contiguous labels.
- Less speckle than plain GMM/k-means.

Deliverables

- segmentation_labels.npy
- brain_mask.npy
- class_means.npy, class_vars.npy
- (optional) NIfTI + QA PNGs