

8 Solution: ???

9. Solution: Let  $X_i = \begin{cases} +1, & \text{if position } i \text{ is a local max} \\ 0, & \text{if position } i \text{ is NOT a local max} \end{cases}$

$$\mathbb{E}[\text{Total local max}] = \mathbb{E}\left[\sum_{i=1}^n X_i\right].$$

$$\text{for } i=1 \text{ or } i=n \quad \mathbb{E}[X_i] = \frac{1}{2}$$

$$\text{for } 1 < i < n. \quad \mathbb{E}[X_i] = \frac{1}{3}$$

$$\text{So, } \mathbb{E}[\text{Total local max}] = \frac{1}{2} \times 2 + \frac{n-2}{3} = \frac{n+1}{3}.$$