**1. Position Score**

* **How It Works:**  
  The function looks at the subject’s bounding box (provided in focus\_object) to determine its center. It then calculates the distances from this center to the four ideal rule-of-thirds intersection points in the frame.
* **Score Calculation:**
  + The minimum distance to these intersections is normalized by the maximum possible distance.
  + A score is derived by subtracting a fraction of this normalized distance from 10.
  + **Additional Penalty:**  
    If the subject takes up more than 50% of the frame, the score is reduced by up to 3 points (but never below 3).

**2. Angle Score**

* **How It Works:**  
  The function uses edge detection (via Canny) and then applies the Hough Transform to detect lines in the grayscale image.
* **Score Calculation:**
  + It extracts the angles of these lines (in degrees).
  + Only angles between 70° and 110° are considered valid (to avoid outliers).
  + The median of the valid angles is calculated.
  + The deviation from a perfect 90° (representing a level horizon) is computed.
  + **Final Score:**  
    The score starts at 10 and is reduced based on how far the median angle is from 90°, with a scaling factor applied (each 6° deviation reduces the score).

**3. Lighting Score**

* **How It Works:**  
  The function evaluates two key properties from the grayscale image:
  + **Brightness:** The average pixel value.
  + **Contrast:** The standard deviation of pixel values.
* **Score Calculation:**
  + **Brightness Score:**  
    Calculated as 10 - (abs(130 - brightness) / 10), where 130 is considered the ideal brightness. The score is floored at 1.
  + **Contrast Score:**
    - If contrast is below 30, the score is set to 3.
    - If contrast is above 100, the score is 4.
    - Otherwise, it’s assigned a high value (8).
  + **Combined Lighting Score:**  
    A weighted sum: 60% brightness and 40% contrast.

**4. Focus Score**

* **How It Works:**  
  The focus measure is computed by combining several edge-detection and laplacian-based methods:
  + **Laplacian Variance:** Measures the spread of edge intensities.
  + **Tenengrad Focus Measure:** Uses Sobel filters to gauge image sharpness.
  + **Sum of Modified Laplacian (SML):** Enhances sensitivity to fine details.
* **Score Calculation:**
  + The individual focus measures are combined with weights (0.3 for Laplacian, 0.4 for Tenengrad, and 0.3 for SML).
  + This combined measure is then mapped to a score between 1 and 10:
    - Focus measure below 100 → score 1 (very blurry).
    - Focus measure above 800 → score 10 (very sharp).
    - In between, the measure is scaled linearly.

**5. Final Photo Score**

* **Combination of Scores:**  
  The final score is computed as a weighted sum of the individual scores:
  + **Position:** 35%
  + **Angle:** 20%
  + **Lighting:** 25%
  + **Focus:** 20%

The formula is:

python

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final\_score = (position\_score \* 0.35) +

(angle\_score \* 0.20) +

(lighting\_score \* 0.25) +

(focus\_score \* 0.20)

The result is rounded to two decimal places.

* **Feedback and Suggestions:**  
  Based on thresholds (e.g., scores below 5), the code also appends feedback messages and suggestions such as adjusting subject placement, straightening the camera, improving lighting, or stabilizing the camera to reduce blur.

**Summary**

* **Position:** Based on the distance of the subject’s center from ideal compositional points, with penalties for overly dominant subjects.
* **Angle:** Determined by how closely the detected line angles approach 90°.
* **Lighting:** A combined metric of brightness (target ~130) and contrast (using set thresholds).
* **Focus:** Evaluated through multiple edge-detection methods, with a linear mapping to a score.
* **Final Score:** A weighted sum that reflects the overall quality of the photo in terms of composition, angle, lighting, and focus.