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import math
from flask import Flask, render_template_string, request

# Flask application ko initialize karein
app = Flask(__name__)

# HTML template, jisme Tailwind CSS aur JavaScript shamil hai
# Ye sab ek hi file mein hai takki deployment asaan ho
html_template = """
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width,
initial-scale=1.0">
    <title>Brick Soling Calculator</title>
    <!-- Tailwind CSS from CDN -->
    <script src="https://cdn.tailwindcss.com"></script>
    <!-- Inter font -->
    <link rel="preconnect" href="https://fonts.googleapis.com">
    <link rel="preconnect" href="https://fonts.gstatic.com"
crossorigin>
    <link
href="https://fonts.googleapis.com/css2?family=Inter:wght@400;500;600;
700&display=swap" rel="stylesheet">
    <style>
        body {
            font-family: 'Inter', sans-serif;
            @apply bg-gray-100 dark:bg-gray-900 text-gray-800
dark:text-gray-200;
        }
    </style>
</head>
<body class="p-4 min-h-screen flex items-center justify-center">
    <div class="bg-white dark:bg-gray-800 p-8 rounded-2xl shadow-lg
w-full max-w-2xl sm:p-10 border border-gray-200 dark:border-gray-700">
        <h1 class="text-3xl sm:text-4xl font-bold text-center
text-gray-900 dark:text-white mb-2">Brick Soling Calculator</h1>
        <p class="text-center text-gray-600 dark:text-gray-400 mb-8">
            This calculator helps you estimate the number of bricks
and material required for soling work.
        </p>

        <!-- Input Form -->
        <form method="POST" class="grid grid-cols-1 sm:grid-cols-2
gap-6 mb-8">
            <div>
                <label for="area" class="block text-sm font-medium
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text-gray-700 dark:text-gray-300 mb-1">Total Area (sq.ft)</label>
                <input type="number" id="area" name="area" step="0.01"
required
                       class="mt-1 block w-full rounded-md
border-gray-300 dark:border-gray-600 shadow-sm
                              focus:border-blue-500
focus:ring-blue-500 bg-gray-50 dark:bg-gray-700 dark:text-white p-3">
            </div>
            <div>
                <label for="brick_length" class="block text-sm
font-medium text-gray-700 dark:text-gray-300 mb-1">Brick Length
(inches)</label>
                <input type="number" id="brick_length"
name="brick_length" step="0.01" required
                       class="mt-1 block w-full rounded-md
border-gray-300 dark:border-gray-600 shadow-sm
                              focus:border-blue-500
focus:ring-blue-500 bg-gray-50 dark:bg-gray-700 dark:text-white p-3">
            </div>
            <div>
                <label for="brick_width" class="block text-sm
font-medium text-gray-700 dark:text-gray-300 mb-1">Brick Width
(inches)</label>
                <input type="number" id="brick_width"
name="brick_width" step="0.01" required
                       class="mt-1 block w-full rounded-md
border-gray-300 dark:border-gray-600 shadow-sm
                              focus:border-blue-500
focus:ring-blue-500 bg-gray-50 dark:bg-gray-700 dark:text-white p-3">
            </div>
            <div>
                <label for="wastage" class="block text-sm font-medium
text-gray-700 dark:text-gray-300 mb-1">Wastage Percentage (%)</label>
                <input type="number" id="wastage" name="wastage"
step="0.01" required value="5"
                       class="mt-1 block w-full rounded-md
border-gray-300 dark:border-gray-600 shadow-sm
                              focus:border-blue-500
focus:ring-blue-500 bg-gray-50 dark:bg-gray-700 dark:text-white p-3">
            </div>
            <div class="sm:col-span-2">
                <button type="submit"
                        class="w-full py-3 px-4 bg-blue-600
hover:bg-blue-700 text-white font-semibold rounded-md shadow-md
                               focus:outline-none focus:ring-2
focus:ring-blue-500 focus:ring-offset-2 transition-colors">
                    Calculate
                </button>
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            </div>
        </form>

        <!-- Results Table (ye tabhi dikhega jab calculation complete
ho jayega) -->
        {% if results %}
        <div class="mt-8 pt-6 border-t border-gray-200
dark:border-gray-700">
            <h2 class="text-2xl font-bold text-center text-gray-900
dark:text-white mb-4">Calculation Results</h2>
            <div class="overflow-x-auto">
                <table class="min-w-full divide-y divide-gray-200
dark:divide-gray-700 rounded-md">
                    <thead class="bg-gray-50 dark:bg-gray-700">
                        <tr>
                            <th class="px-6 py-3 text-left text-sm
font-semibold text-gray-500 dark:text-gray-300">Description</th>
                            <th class="px-6 py-3 text-left text-sm
font-semibold text-gray-500 dark:text-gray-300">Value</th>
                        </tr>
                    </thead>
                    <tbody class="bg-white dark:bg-gray-800 divide-y
divide-gray-200 dark:divide-gray-700">
                        <tr>
                            <td class="px-6 py-4 whitespace-nowrap
text-sm font-medium text-gray-900 dark:text-gray-100">Total Bricks
Required</td>
                            <td class="px-6 py-4 whitespace-nowrap
text-sm text-gray-500 dark:text-gray-400">{{ results['total_bricks']
}}</td>
                        </tr>
                        <tr>
                            <td class="px-6 py-4 whitespace-nowrap
text-sm font-medium text-gray-900 dark:text-gray-100">Sand Bedding
Volume</td>
                            <td class="px-6 py-4 whitespace-nowrap
text-sm text-gray-500 dark:text-gray-400">{{
"%.2f"|format(results['sand_bedding_ft3']) }} ft³ ({{
"%.3f"|format(results['sand_bedding_m3']) }} m³)</td>
                        </tr>
                        <tr>
                            <td class="px-6 py-4 whitespace-nowrap
text-sm font-medium text-gray-900 dark:text-gray-100">Soil Leveling
Volume</td>
                            <td class="px-6 py-4 whitespace-nowrap
text-sm text-gray-500 dark:text-gray-400">{{
"%.2f"|format(results['soil_leveling_ft3']) }} ft³ ({{
"%.3f"|format(results['soil_leveling_m3']) }} m³)</td>
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                        </tr>
                        <tr>
                            <td class="px-6 py-4 whitespace-nowrap
text-sm font-medium text-gray-900 dark:text-gray-100">Joint Filling
Volume</td>
                            <td class="px-6 py-4 whitespace-nowrap
text-sm text-gray-500 dark:text-gray-400">{{
"%.2f"|format(results['joint_filling_ft3']) }} ft³ ({{
"%.3f"|format(results['joint_filling_m3']) }} m³)</td>
                        </tr>
                        <tr class="bg-gray-50 dark:bg-gray-700
font-bold">
                            <td class="px-6 py-4 whitespace-nowrap
text-sm text-gray-900 dark:text-gray-100">Total Material Summary</td>
                            <td class="px-6 py-4 whitespace-nowrap
text-sm text-gray-500 dark:text-gray-400">
                                {{
"%.2f"|format(results['total_material_ft3']) }} ft³ ({{
"%.3f"|format(results['total_material_m3']) }} m³)
                            </td>
                        </tr>
                    </tbody>
                </table>
            </div>
        </div>
        {% endif %}
    </div>
</body>
</html>
"""

@app.route('/', methods=['GET', 'POST'])
def index():
    results = None
    if request.method == 'POST':
        try:
            # User input ko retrieve karein
            total_area_sqft = float(request.form['area'])
            brick_length_inch = float(request.form['brick_length'])
            brick_width_inch = float(request.form['brick_width'])
            wastage_percent = float(request.form['wastage'])

            # Inch ko foot mein convert karein
            brick_length_ft = brick_length_inch / 12
            brick_width_ft = brick_width_inch / 12

            # Ek brick ka area calculate karein (ft²)
            brick_area_sqft = brick_length_ft * brick_width_ft
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            # Total bricks without wastage
            num_bricks_no_waste = total_area_sqft / brick_area_sqft

            # Total bricks with wastage (rounded up)
            total_bricks = math.ceil(num_bricks_no_waste * (1 +
wastage_percent / 100))

            # Sand bedding volume (1 inch thick, ft³)
            # 1 inch = 1/12 foot
            sand_bedding_volume_ft3 = total_area_sqft * (1 / 12)

            # Soil leveling volume (2 inch thick, ft³)
            # 2 inch = 2/12 foot
            soil_leveling_volume_ft3 = total_area_sqft * (2 / 12)

            # Joint filling volume (5% of total brick volume)
            # Assumption: Brick height is 3 inches (common size)
            brick_height_ft = 3 / 12
            total_brick_volume_ft3 = num_bricks_no_waste *
(brick_length_ft * brick_width_ft * brick_height_ft)
            joint_filling_volume_ft3 = total_brick_volume_ft3 * 0.05

            # Ft³ ko m³ mein convert karein (1 m³ = 35.315 ft³)
            sand_bedding_volume_m3 = sand_bedding_volume_ft3 / 35.315
            soil_leveling_volume_m3 = soil_leveling_volume_ft3 /
35.315
            joint_filling_volume_m3 = joint_filling_volume_ft3 /
35.315

            # Total material volume
            total_material_ft3 = sand_bedding_volume_ft3 +
soil_leveling_volume_ft3 + joint_filling_volume_ft3
            total_material_m3 = total_material_ft3 / 35.315

            # Results ko ek dictionary mein store karein
            results = {
                'total_bricks': total_bricks,
                'sand_bedding_ft3': sand_bedding_volume_ft3,
                'sand_bedding_m3': sand_bedding_volume_m3,
                'soil_leveling_ft3': soil_leveling_volume_ft3,
                'soil_leveling_m3': soil_leveling_volume_m3,
                'joint_filling_ft3': joint_filling_volume_ft3,
                'joint_filling_m3': joint_filling_volume_m3,
                'total_material_ft3': total_material_ft3,
                'total_material_m3': total_material_m3
            }
```

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        except (ValueError, ZeroDivisionError):
            # Error hone par, empty results return karein
            pass

    # Template ko results ke saath render karein
    return render_template_string(html_template, results=results)

if __name__ == '__main__':
    # App ko debug mode mein chalayein
    app.run(debug=True)
```