

NAME – SAI YASWANTH REDDY SURAM

REGISTRATION NUMBER-21BCE2942

ACXC163N - Recent Trends in Refrigeration and Air Conditioning

Event Task 1: Cooling Load Calculator of a Building

SCOPE Student

Objective: Create a Python program that calculates the cooling load for a building based on user input.

GITHUB LINK:- <https://github.com/yaswanth14062003/21BCE2942>

CODE:-

```
main.py
1 #S.SAI YASWANTH REDDY,21BCE2942
2 def calculate_cooling_load(area, num_occupants, building_type, outdoor_temp, indoor_temp):
3     if building_type.lower() == "residential":
4         cooling_load = 100 * num_occupants
5     elif building_type.lower() == "commercial":
6         cooling_load = 150 * num_occupants
7     else:
8         raise ValueError("Invalid building type. Supported types: residential, commercial")
9
10    u_coefficient = 30 # W/m²°C
11    q_conduction = u_coefficient * area * (outdoor_temp - indoor_temp)
12    sensible_cooling_load = q_conduction + cooling_load
13
14    return sensible_cooling_load
15
16
17 # Taking user inputs
18 try:
19     area = float(input("Enter the area of the building (in square meters): "))
20     num_occupants = int(input("Enter the number of occupants in the building: "))
21     building_type = input("Enter the type of building (residential/commercial): ")
22
23     outdoor_temp = float(input("Enter the outdoor temperature (in Celsius): "))
24     indoor_temp = float(input("Enter the indoor desired temperature (in Celsius): "))
25
26     cooling_load = calculate_cooling_load(area, num_occupants, building_type, outdoor_temp, indoor_temp)
27     print(f"The sensible cooling load is: {cooling_load} W")
28 except ValueError as e:
29     print(f"Error: {e}")
```

OUTPUT:-

```
Enter the area of the building (in square meters): 500
Enter the number of occupants in the building: 10
Enter the type of building (residential/commercial): residential
Enter the outdoor temperature (in Celsius): 45
Enter the indoor desired temperature (in Celsius): 17
The sensible cooling load is: 421000.0 W

...Program finished with exit code 0
Press ENTER to exit console.
```

WEBPAGE:-**2942.html:-**

```

C: > Users > yaswa > Desktop > <> 2942.html > ...
 1  <!DOCTYPE html>
 2  <html>
 3  <head>
 4      <title>Cooling Load Calculator</title>
 5      <style>
 6          body {
 7              font-family: Arial, sans-serif;
 8          }
 9
10      .container {
11          max-width: 400px;
12          margin: 0 auto;
13          padding: 20px;
14          border: 1px solid #ccc;
15          border-radius: 5px;
16      }
17
18      label {
19          display: block;
20          margin-bottom: 5px;
21      }
22
23      input {
24          width: 100%;
25          margin-bottom: 10px;

```

```

26          padding: 5px;
27      }
28
29      button {
30          padding: 8px 20px;
31          background-color: #4CAF50;
32          color: white;
33          border: none;
34          border-radius: 5px;
35          cursor: pointer;
36      }
37
38      button:hover {
39          background-color: #45a049;
40      }
41
42      #result {
43          margin-top: 15px;
44          font-weight: bold;
45      }
46  </style>
47  </head>
48  <body>
49      <div class="container">
50          <h2>Cooling Load Calculator</h2>

```

```

51     <label for="area">Area of the building (in square meters):</label>
52     <input type="number" id="area" required>
53
54     <label for="num_occupants">Number of occupants in the building:</label>
55     <input type="number" id="num_occupants" required>
56
57     <label for="building_type">Type of building:</label>
58     <select id="building_type" required>
59         <option value="residential">Residential</option>
60         <option value="commercial">Commercial</option>
61     </select>
62
63     <label for="outdoor_temp">Outdoor temperature (in Celsius):</label>
64     <input type="number" id="outdoor_temp" required>
65
66     <label for="indoor_temp">Indoor desired temperature (in Celsius):</label>
67     <input type="number" id="indoor_temp" required>
68
69     <button onclick="calculateCoolingLoad()">Calculate</button>
70
71     <div id="result"></div>
72 </div>
73
74 <script>
75     function calculateCoolingLoad() {

```

```

76         const area = parseFloat(document.getElementById("area").value);
77         const num_occupants = parseInt(document.getElementById("num_occupants").value);
78         const building_type = document.getElementById("building_type").value;
79         const outdoor_temp = parseFloat(document.getElementById("outdoor_temp").value);
80         const indoor_temp = parseFloat(document.getElementById("indoor_temp").value);
81
82         const coolingLoad = building_type === "residential" ? 100 * num_occupants : 150 * num_occupant;
83         const uCoefficient = 30;
84         const qConduction = uCoefficient * area * (outdoor_temp - indoor_temp);
85         const sensibleCoolingLoad = qConduction + coolingLoad;
86
87         document.getElementById("result").innerText = `The sensible cooling load is: ${sensibleCoolingLoad} W`;
88     }
89 </script>
90 </body>
91 </html>

```

OUTPUT:-

File | C:/Users/yaswa/Desktop/2942.html

**Cooling Load Calculator**

Area of the building (in square meters):

Number of occupants in the building:

Type of building:

Residential

Outdoor temperature (in Celsius):

Indoor desired temperature (in Celsius):

Calculate

File | C:/Users/yaswa/Desktop/2942.html

**Cooling Load Calculator**

Area of the building (in square meters):

500

Number of occupants in the building:

10

Type of building:

Residential

Outdoor temperature (in Celsius):

45

Indoor desired temperature (in Celsius):

17

Calculate

The sensible cooling load is: 421000 W

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