```cpp
1: /*
2:  Chaitanya Dubey
3: */
4:
5: #include <iostream> //lets us use cout and cin
6:
7: using namespace std;
8:
9: int main()
10: {
11:     //Defining the variables:
12:     float c_p = 4.2;
13:     float HV = 45.0 * 1000 ; // converting MJ/kg to kJ/kg
14:
15:     float mass_water = 0.0;
16:     float change_in_temp = 0.0;
17:     float mass_gas = 0.0;
18:
19:     float energy_in = 0.0;
20:     float energy_out = 0.0;
21:     float efficiency = 0.0;
22:
23:     //Taking in the input:
24:     cout << "What is the mass of the water needed to be heated? (in kg) ";
25:     cin >> mass_water;
26:
27:     cout << "What is the change in temperature? (in celsius) ";
28:     cin >> change_in_temp;
29:
30:     cout << "What is the mass of the natural gas needed to heat the water? (in kg) ";
31:     cin >> mass_gas;
32:
33:     //Calculating efficiency:
34:     energy_out = mass_water*c_p*change_in_temp;
35:     energy_in = mass_gas*HV;
36:     efficiency = energy_out/energy_in;
37:
38:     //Printing output:
39:     cout << "The efficiency of the water heater is " << efficiency;
40:     return 0;
41: }
42:
43: /*
44:
45: PEER AKNOWLEDGEMENT: Tejas
46:
47:
48: TEST 1:
49:
50: What is the mass of the water needed to be heated? (in kg) 100
51: What is the change in temperature? (in celsius) 60
52: What is the mass of the natural gas needed to heat the water? (in kg) 0.8
53: The efficiency of the water heater is 0.7
54: --------------------------------
55: Process exited after 8.094 seconds with return value 0
```

```
56: Press any key to continue . . .
57:
58: TEST 2:
59:
60: What is the mass of the water needed to be heated? (in kg) 10.5
61: What is the change in temperature? (in celsius) 21.5
62: What is the mass of the natural gas needed to heat the water? (in kg) 0.05
63: The efficiency of the water heater is 0.4214
64: --------------------------------
65: Process exited after 9.236 seconds with return value 0
66: Press any key to continue . . .
67:
68: */
```