Title

Material Strength to Weight

Problem Description

Create a program that allows the user to look up some material properties according to the following table:

Material	Strength [kg/m^2]	Density [g/cm^3]	Strength-to-weight ratio [cm]
Polyethylene	70×10^4	0.83	8.43×10^4
Pure aluminum	455×10^4	2.17	16.79×10^4
Al_2O_3	21×10^6	3.16	0.66×10^6
Epoxy	105×10^5	1.38	7.61×10^5
Heat-treated alloy steel	17×10^7	7.75	0.22×10^7
Heat-treated aluminum alloy	60×10^6	2.71	2.21×10^6
Carbon-carbon composite	42×10^6	1.80	2.33×10^6
Heat-treated titanium alloy	12×10^7	4.43	0.27×10^7
Kevlar-epoxy composite	46×10^6	1.47	3.13×10^6
Carbon-epoxy composite	56×10^6	1.38	4.06×10^6

D. Askeland et al., *The Science and Engineering of Materials, Sixth ed, SI ed*, Stamford, CT: Cengage Learning, 2011, p 16.

The user should be presented with a menu to select the material to look up and then be presented with the information for the desired material.

Testing

Sample output:

```
1. Polyethylene
2. Pure aluminium
3. Al2O3
4. Epoxy
5. Heat-treated alloy steel
6. Heat-treated aluminium alloy
7. Carbon-carbon composite
8. Heat-treated titanium alloy
9. Kevlar-epoxy composite
10. Carbon-epoxy composite
Select a material:
8

Material: Heat-treated titanium alloy
Strength: 12e7 [kg/m^2]
Density: 4.43 [g/cm^3]
Strength-to-weight ratio: 0.27e7 [cm]
```

Time Target

*** < 5 minutes

** 5-10 minutes

* greater than 10 minutes

Section

Data types and if statements