Exercise 1-1: After assigned reading from Ch. 1, do Problems 1.1.1-1.1.26 from the text. Follow example of the given answers.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.1</td>
<td>3, server</td>
</tr>
<tr>
<td>1.1.2</td>
<td></td>
</tr>
<tr>
<td>1.1.3</td>
<td></td>
</tr>
<tr>
<td>1.1.4</td>
<td></td>
</tr>
<tr>
<td>1.1.5</td>
<td></td>
</tr>
<tr>
<td>1.1.6</td>
<td></td>
</tr>
<tr>
<td>1.1.7</td>
<td>8, data center</td>
</tr>
<tr>
<td>1.1.8</td>
<td></td>
</tr>
<tr>
<td>1.1.9</td>
<td>4, low-end server</td>
</tr>
<tr>
<td>1.1.10</td>
<td></td>
</tr>
<tr>
<td>1.1.11</td>
<td></td>
</tr>
<tr>
<td>1.1.12</td>
<td></td>
</tr>
<tr>
<td>1.1.13</td>
<td></td>
</tr>
<tr>
<td>1.1.14</td>
<td></td>
</tr>
<tr>
<td>1.1.15</td>
<td></td>
</tr>
<tr>
<td>1.1.16</td>
<td></td>
</tr>
<tr>
<td>1.1.17</td>
<td></td>
</tr>
<tr>
<td>1.1.18</td>
<td></td>
</tr>
<tr>
<td>1.1.19</td>
<td></td>
</tr>
<tr>
<td>1.1.20</td>
<td></td>
</tr>
<tr>
<td>1.1.21</td>
<td></td>
</tr>
<tr>
<td>1.1.22</td>
<td></td>
</tr>
<tr>
<td>1.1.23</td>
<td></td>
</tr>
<tr>
<td>1.1.24</td>
<td></td>
</tr>
<tr>
<td>1.1.25</td>
<td></td>
</tr>
<tr>
<td>1.1.26</td>
<td></td>
</tr>
</tbody>
</table>
(3 pts) Exercise 1-2

• Do exercise 1.7.3 from the textbook. Give your answers as a ratio – for instance, a difference of 200 MHz vs. 66 Mhz yields a ratio of $200/66 = 3$.

• Final answers:
  – Clock rate ratio:
  – Power ratio:

• Notice the difference between the two!
(5 pts) Exercise 2-1

- What is the MIPS assembly code for the following:
  \[ g = g + h - i; \]
  Variables g, h, & i are assigned registers $s1$, $s2$, and $s4$

(5 pts) Exercise 2-2

- What is the MIPS assembly code for the following:
  \[ g = h + A[3]; \]
  Variables g, h, & i are assigned registers $s1$, $s2$, and $s4$
  Array A base address is assigned register $s3$
(5 pts) Exercise 2-3

- What is the MIPS assembly code for the following:
  \[ g = h + A[i]; \]
  Variables \( g \), \( h \), & \( i \) are assigned registers \$s1\,\,\,\,\,$s2, and \$s4
  Array \( A \) base address is assigned register \$s3\n
Exercise 2-4: Assume variables $a$, $b$, and $c$ are assigned registers $s1$, $s2$, and $s3$, and the address of array $A$ is in $s6$. Write the code for the following:


Exercise 2-5: Assume variables $a$, $b$, and $c$ are assigned registers $s1$, $s2$, and $s3$, and the address of array $A$ is in $s6$. Write the code for the following:

$$b = A[2 * c];$$
(6 pts) Exercise 2-8

(See number discussion in Section 2.5)

• What binary number does this hexadecimal number represent:
  \( \text{7fff ffaf}_{\text{hex}} \)?

• What decimal number does it represent?

(10 pts) Exercise 2-9

Show the \text{hexadecimal} representation of this MIPS instruction:

\[
\text{add} \quad t0, \quad t1, \quad \text{zero}
\]
(10 pts) Exercise 2-10

What MIPS instruction is represented by this binary entry:

1000 1101 0000 1001 0000 0000 0100 0000

(5 pts) Exercise 2-11

- What is the MIPS assembly code for the following:

```plaintext
if (g != j)  h = g - h;
else         h = g + h;
```

Variables f to j are assigned to registers $s0 to $s4
(5 pts) Exercise 2-12

• What is the MIPS assembly code for the following:
  \[
  \text{if (j == h) } \ g = i + j;
  \]

  Variables f to j are assigned to registers $s0$ to $s4$

  \[
  f \ s0 \\
  g \ s1 \\
  h \ s2 \\
  i \ s3 \\
  j \ s4
  \]

(5 pts) Exercise 2-13

• What is the MIPS assembly code for the following:
  \[
  \text{if (j == h) } \&\& \ (f != i) \ g = i + j;
  \]

  Variables f to j are assigned to registers $s0$ to $s4$

  \[
  f \ s0 \\
  g \ s1 \\
  h \ s2 \\
  i \ s3 \\
  j \ s4
  \]
(10 pts) Exercise 2-14

- What is the MIPS assembly code for the following:
  ```
  if ( ( (g != h) && (f == i) ) ||
      (g == i) )
  g = i + j;
  ```

Variables f to j are assigned to registers $s0$ to $s4$