(10 pts) Carefully do assigned reading for Chapter 1 (1.1-1.5, 1.7-1.8) (especially important b/c much of this chapter not covered in class).

Then answer the following questions.
→ Exercise 1.1 from the book (see end of chapter). Place your answers below (list and briefly describe).

1.

2.

3.

4.

(3 pts) Exercise 1-2

- Do exercise 1.2 from the textbook. Follow example below, where some answers are provided for you. Use each term exactly once.

a.

b. (Hint: think about what these cables are made of)

c. *Performance via Prediction*

d.

e. *Hierarchy of Memories*

f.

g.

h.
(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 \(s3\)
(10 pts) Exercise 2-4: Assume variables $a$, $b$, and $c$ are assigned registers $s1$, $s2$, and $s3$, and the address of array $A$ is in $s5$. Write the code for the following:

\[
\]

(10 pts) Exercise 2-5: Assume variables $a$, $b$, and $c$ are assigned registers $s1$, $s2$, and $s3$, and the address of array $A$ is in $s5$. 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:
  $7ffe \text{_{hex}}$?

• What decimal number does it represent?

(10 pts) Exercise 2-9

Show the hexadecimal representation of this MIPS instruction:

```
add $t0 , $t1 , $zero
```
(10 pts) Exercise 2-10

What MIPS instruction is represented by this binary entry:
(Tip: start by figuring out what the opcode is, then the instruction type)

```
1000 1101 0000 1001 0000 0000 0100 0100
```

(5 pts) Exercise 2-11

- What is the MIPS assembly code for the following:

  ```
  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:
  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:
  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:

```plaintext
if ( ((g != h) && (f == i)) ||
     (g == i) )
  g = i + j;
```

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