

Use Additional Formatting Features for Nice Output

```
printf ("%04X: ", start & 0xFFFF);
```

What does "04" mean?

4 is the **field width**

- printf outputs **at least 4 characters** and
- **right-justifies** the output
- with **leading spaces**

0 means **use leading zeroes** instead

Let's Design the Second Iteration (Inner Loop)

Now it's time to iterate again.

The output format appears below.

```
01F8:                                     E002 F022 F025 000A
0204: 0057 0065 006C 0063 006F 006D 0065 0020 0074 006F 0020 0074
0210: 0068 0065 0020 004C 0043 002D 0033 0020 0073 0069 006D 0075
021C: 006C 0061 0074 006F 0072
```

0. What is the task that you're repeating?

Print one memory location.

Need to Make Up Variables for Our Assumptions

```
01F8:                                     E002 F022 F025 000A
0204: 0057 0065 006C 0063 006F 006D 0065 0020 0074 006F 0020 0074
0210: 0068 0065 0020 004C 0043 002D 0033 0020 0073 0069 006D 0075
021C: 006C 0061 0074 006F 0072
```

1. What is true at the start of "test" in each iteration?
 - a. **addr** holds address of the memory location to print.
 - b. **index** is the line index (0 to 11).

We have to make these invariants hold true!

Stop After Printing 12 Locations

```
01F8:                                     E002 F022 F025 000A
0204: 0057 0065 006C 0063 006F 006D 0065 0020 0074 006F 0020 0074
0210: 0068 0065 0020 004C 0043 002D 0033 0020 0073 0069 006D 0075
021C: 006C 0061 0074 006F 0072
```

2. When does the iteration stop (what is "test")?

Stop when **index** \geq 12.

Using **index** makes the test easier.