

# Practicing for loops

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## 1 README

- Practice workbook for for loops in C.
- See `cc100/6_loops/README.org` in GitHub for script/solutions

### 1.1 Emacs tip for better layout

#### 1.1.1 Hide emphatic characters like ~, \*

To **not** see the emphatic characters like ~ or \* or / in the Org file text, run the following code chunk (or put the code in your `/.emacs` file): if successful, you should see "t" in the minibuffer.

```
(setq-default org-hide-emphasis-markers t)
```

This will only work for new buffers. If you don't put it in your `/.emacs` file, the command will only work for the current Emacs session.

#### 1.1.2 Change your theme

- In Emacs, type `M-x custom-themes`
- In the buffer that appears, select `Leuven`
- Select `Apply` and `Save Setting`

## 2 The for statement

### 2.1 Countdown example

- You can always convert a `for` loop into a `while` loop and vice versa.
- [ ] Rewrite the countdown code 1 below using a `for` loop.
- So as not to lose the original code, use the code block below this one.

```
int i = 10;
while ( i > 0 ) {
    printf("T minus %d and counting\n", i);
    i--;
}
printf("i = %d\n", i);
```

```
T minus 10 and counting
T minus 9 and counting
T minus 8 and counting
T minus 7 and counting
T minus 6 and counting
T minus 5 and counting
T minus 4 and counting
T minus 3 and counting
T minus 2 and counting
T minus 1 and counting
i = 0
```

## SOLUTION:

```
int i, n;

for (i = 10 ; i > 0 ; i--) {
    printf("T minus %d and counting\n", i);
}
printf("i = %d\n", i);
```

```
T minus 10 and counting
T minus 9 and counting
T minus 8 and counting
T minus 7 and counting
T minus 6 and counting
T minus 5 and counting
T minus 4 and counting
T minus 3 and counting
T minus 2 and counting
T minus 1 and counting
i = 0
```

## 2.2 for statement patterns

- for statements are especially useful to count up or down
- [ ]

Print "hello world" 10 times using a for loop and counting up from `i = 0` to `i = 9`.

```
for( int i = 0 ; i < 10 ; i++)
    printf("%d: hello world\n", i);
```

```
0: hello world
1: hello world
2: hello world
```

```
3: hello world
4: hello world
5: hello world
6: hello world
7: hello world
8: hello world
9: hello world
```

## 2.3 Omitting controlling expressions

- You can omit some or all of the expressions in a `for` loop.
- I've omitted the third expression in the code block below.
- When you run the block you will realize that it does not end.
- [ ] Fix the error **without** changing the controlling expressions so that you can see the countdown from 10 to 1 as output!
- Put the correct code into the **SOLUTION** code block below this one so as not to lose the example code.

```
for ( int i = 10 ; i > 0 ; )
    printf("T minus %d and counting\n");
```

### SOLUTION:

```
for ( int i = 10 ; i > 0 ; )
    printf("T minus %d and counting\n", i--);
```

## 2.4 Summing numbers

- [ ] Rewrite the summing numbers code 1 below with `for` instead of `do...while`.
- Put your solution into the **SOLUTION** block below so as not to lose the sample code.

```
int n = 0, sum = 0;

printf("Enter integers (0 to terminate).\n");

do {
    sum += n;          // sum = sum + n
    scanf("%d", &n);
} while ( n != 0 );

printf("The sum is %d\n", sum);
```

```
Enter integers (0 to terminate).
The sum is 107
```

### SOLUTION:

```
int n, sum = 0;

scanf("%d", &n);

for ( ; n != 0; ) {
```

```
    sum += n;  
    scanf("%d", &n);  
}  
  
printf("The sum is %d\n", sum);
```

The sum is 107

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