コース: C Programming

# The C Programming Language - BK and DR Notebook

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**Abstract**

My notes while working through the second edition of Brian Kernighan and Dennis Ritchies's C Programming Language textbook.

# Contents

# Chapter 1

# A tutorial introduction

* See excercises in the external folder marked: programs

## 1.1 Getting started

1. Nothing really new in this section.

## 1.2 Variables and Arithmetic Expressions

**Notes on the fahrenheit celsius program:**

1. Formula to use: Celsius = (5/9)(fahrenheit-32)
2. This formula will be used to calculate the celsius and fahrenheit equivalents.
3. Each line of the table is computed using a while that repeats once per output line.
4. The while loop will test if the condition is true (fahr is less than or equal to upper.
5. The body of the loop will then be executed.
6. The reason for multiplying by 5 and then dividing by 9 instead of just multiplying by 5/9 is that integer division is truncated. (any fractional part is discarded)

The code should look something like this

Listing 1.1: Fahr celcius table implementation

```
#include <stdio.h>

int main(void)
{
        int celsius;
        int fahr = 0;
        int interval = 20;

        while (fahr <= 300)
        {
                celsius = 5 * (fahr - 32) / 9;
                printf("%d\t%d\n", fahr, celsius);
                fahr = fahr + interval;
        }
}
```

The above temperature converter makes use of a while loop and 3 different variables. This code works and outputs the expected result but can also be written many other ways. One way to write it would be with a for loop.

Listing 1.2: Fahr celsius table with a for loop

```
#include <stdio.h>

int main(void)
{
        int celsius;
        int fahr = 0;
        int interval = 20;

        while (fahr <= 300)
        {
                celsius = 5 * (fahr - 32) / 9;
                printf("%d\t%d\n", fahr, celsius);
                fahr = fahr + interval;
        }
}
```

## 1.3 Excercise 1-5

**Task:** Modify the temperature conversion program to print the table in reverse order, from 300 degrees to 0.

Listing 1.3: Excericise 1-5

```
#include <stdio.h>

int main(void)
{
        int celsius;
        int fahr = 0;
        int interval = 20;

        while (fahr <= 300)
        {
                celsius = 5 * (fahr - 32) / 9;
                printf("%d\t%d\n", fahr, celsius);
                fahr = fahr + interval;
        }
}
```