

첫날

C 맛보기 남~남~

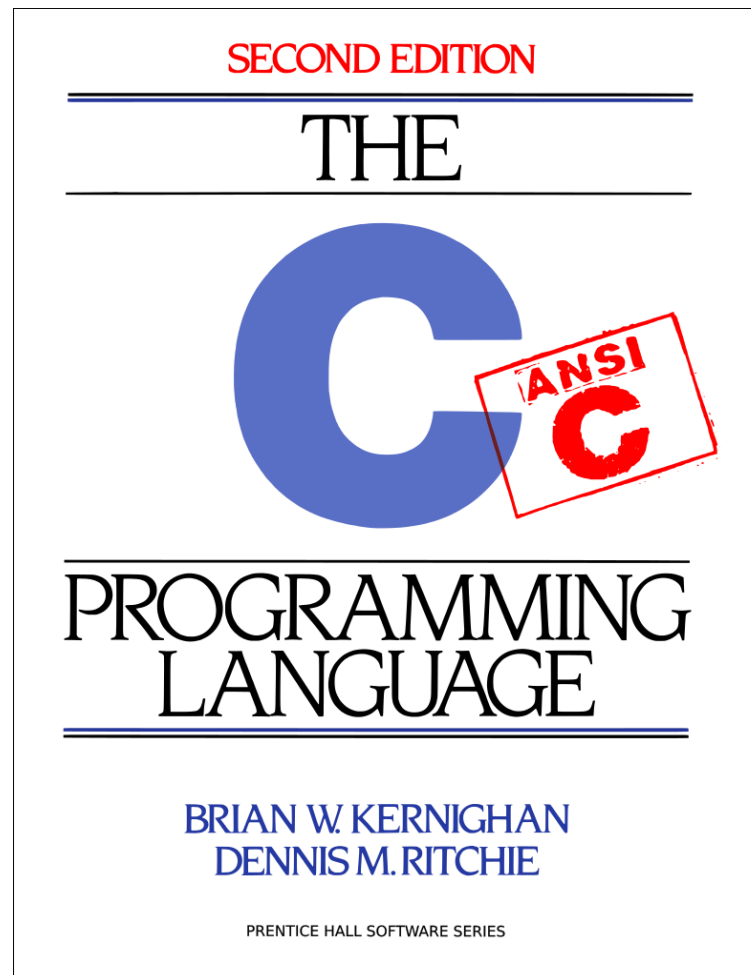
CSE2018 시스템프로그래밍기초
2016년 2학기

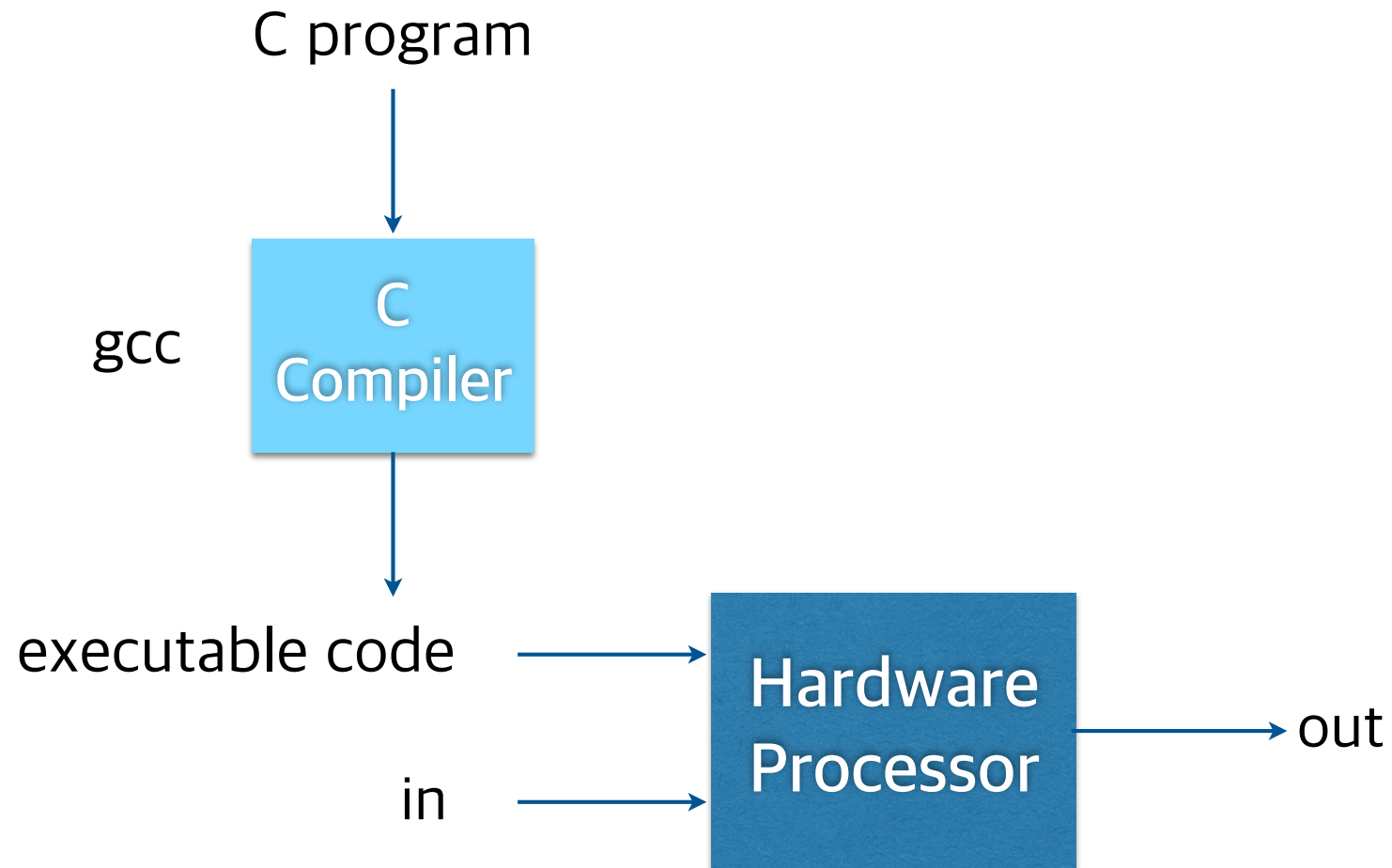
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컴퓨터공학과 => 소프트웨어학부
도경구

C (프로그래밍 언어)



[https://ko.wikipedia.org/wiki/C_\(%ED%94%84%EB%A1%9C%EA%B7%B8%EB%9E%98%EB%B0%8D_%EC%96%B8%EC%96%B4\)](https://ko.wikipedia.org/wiki/C_(%ED%94%84%EB%A1%9C%EA%B7%B8%EB%9E%98%EB%B0%8D_%EC%96%B8%EC%96%B4))





gcc = GNU Compiler Collection

명령창에 다음과 같이 프린트하기
hello, world

hello.c

```
#include <stdio.h>

int main() {
    printf("hello, world\n");
}
```

명령창에 다음과 같이 프린트하기
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다음 온도변환 공식을 써서

$$C = (5/9)(F - 32)$$

아래와 같은 형식으로

화씨/섭씨 온도 변환표를 명령창에 프린트하기

0	-17
20	-6
40	4
60	15
80	26
100	37
120	48
140	60
160	71
180	82
200	93
220	104
240	115
260	126
280	137
300	148

temp.c

```
#include <stdio.h>

/* print Fahrenheit-Celsius table
   for fahr = 0, 20, ..., 300 */
int main() {
    int fahr, celsius;
    int lower, upper, step;

    lower = 0;    /* lower limit of temperature table */
    upper = 300;  /* upper limit */
    step = 20;    /* step size */

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

comment
주석

temp.c

```
#include <stdio.h>

/* print Fahrenheit-Celsius table
   for fahr = 0, 20, ..., 300 */
int main() {
    int fahr, celsius;
    int lower, upper, step;

    lower = 0;    /* lower limit of temperature table */
    upper = 300;  /* upper limit */
    step = 20;    /* step size */

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

variable declaration
변수 선언

temp.c

data types

char
short
int
long
float
double
...

```
#include <stdio.h>

/* print Fahrenheit-Celsius table
   for fahr = 0, 20, ..., 300 */
int main() {
    int fahr, celsius;
    int lower, upper, step;

    lower = 0;    /* lower limit of temperature table */
    upper = 300;  /* upper limit */
    step = 20;    /* step size */

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

assignment statement
배정문(지정문)

temp.c

```
#include <stdio.h>

/* print Fahrenheit-Celsius table
   for fahr = 0, 20, ..., 300 */
int main() {
    int fahr, celsius;
    int lower, upper, step;

    lower = 0;      /* lower limit of temperature table */
    upper = 300;    /* upper limit */
    step = 20;      /* step size */

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

loop
반복문

```
while (i < j)
    i = 2 * i;
```

temp.c

```
#include <stdio.h>

/* print Fahrenheit-Celsius table
   for fahr = 0, 20, ..., 300 */
int main() {
    int fahr, celsius;
    int lower, upper, step;

    lower = 0;      /* lower limit of temperature table */
    upper = 300;    /* upper limit */
    step = 20;      /* step size */

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

temp.c

```
#include <stdio.h>

/* print Fahrenheit-Celsius table
   for fahr = 0, 20, ..., 300 */
int main() {
    int fahr, celsius;
    int lower, upper, step;

    lower = 0;    /* lower limit of temperature table */
    upper = 300;  /* upper limit */
    step = 20;    /* step size */

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

$$C = (5/9)(F - 32)$$

temp.c

```
#include <stdio.h>

/* print Fahrenheit-Celsius table
   for fahr = 0, 20, ..., 300 */
int main() {
    int fahr, celsius;
    int lower, upper, step;

    lower = 0;    /* lower limit of temperature table */
    upper = 300;  /* upper limit */
    step = 20;    /* step size */

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

```
printf("%3d %6d\n", fahr, celsius);
```


temp2.c

```
#include <stdio.h>

/* print Fahrenheit-Celsius table
   for fahr = 0, 20, ..., 300; floating-point version */
int main() {
    float fahr, celsius;
    int lower, upper, step;

    lower = 0;    /* lower limit of temperature table */
    upper = 300;  /* upper limit */
    step = 20;    /* step size */

    fahr = lower;
    while (fahr <= upper) {
        celsius = (5.0 / 9.0) * (fahr - 32.0);
        printf("%3.0f %6.1f\n", fahr, celsius);
        fahr = fahr + step;
    }
}
```

$$C = (5/9)(F - 32)$$

automatic type conversion

자동 타입 변환

temp2.c

```
#include <stdio.h>

/* print Fahrenheit-Celsius table
   for fahr = 0, 20, ..., 300; floating-point version */
int main() {
    float fahr, celsius;
    int lower, upper, step;

    lower = 0;    /* lower limit of temperature table */
    upper = 300;  /* upper limit */
    step = 20;    /* step size */

    fahr = lower;
    while (fahr <= upper) {
        celsius = (5.0 / 9.0) * (fahr - 32.0);
        printf("%3.0f %6.1f\n", fahr, celsius);
        fahr = fahr + step;
    }
}
```

```
celsius = (5.0 / 9.0) * (fahr - 32);
```

temp2.c

```
#include <stdio.h>

/* print Fahrenheit-Celsius table
   for fahr = 0, 20, ..., 300; floating-point version */
int main() {
    float fahr, celsius;
    int lower, upper, step;

    lower = 0;    /* lower limit of temperature table */
    upper = 300;  /* upper limit */
    step = 20;    /* step size */

    fahr = lower;
    while (fahr <= upper) {
        celsius = (5.0 / 9.0) * (fahr - 32.0);
        printf("%3.0f %6.1f\n", fahr, celsius);
        fahr = fahr + step;
    }
}
```

temp4.c

```
#include <stdio.h>

/* print Fahrenheit-Celsius table */
int main() {
    int fahr;

    for (fahr = 0; fahr <= 300; fahr = fahr + 20)
        printf("%3d %6.1f\n", fahr, (5.0 / 9.0) * (fahr - 32));
}
```

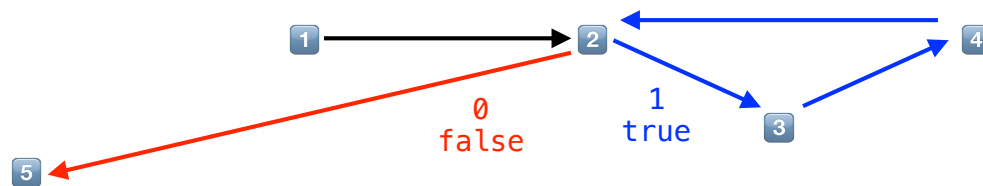
for Loop

temp4.c

```
#include <stdio.h>

/* print Fahrenheit-Celsius table */
int main() {
    int fahr;

    for (fahr = 0; fahr <= 300; fahr = fahr + 20)
        printf("%3d %6.1f\n", fahr, (5.0 / 9.0) * (fahr - 32));
}
```



Symbolic Constants

temp5.c

```
#include <stdio.h>

#define LOWER 0      /* lower limit of table */
#define UPPER 300    /* upper limit */
#define STEP 20      /* step size */

/* print Fahrenheit-Celsius table */
int main() {
    int fahr;

    for (fahr = LOWER; fahr <= UPPER; fahr = fahr + STEP)
        printf("%3d %6.1f\n", fahr, (5.0 / 9.0) * (fahr - 32));
}
```

Character Input and Output

문자 입출력

```
c = getchar()
```

```
putchar()
```

File Copying

한 번에 문자 하나씩 입력에서 출력으로 카피하기

알고리즘

```
read a character  
while (character is not end-of-file indicator)  
output the character just read  
read a character
```

filecopy.c

```
#include <stdio.h>  
  
/* copy input to output; 1st version */  
int main() {  
    int c;  
  
    c = getchar();  
    while (c != EOF) {  
        putchar(c);  
        c = getchar();  
    }  
}
```


File Copying

한 번에 문자 하나씩 입력에서 출력으로 카피하기

알고리즘

```
read a character  
while (character is not end-of-file indicator)  
output the character just read  
read a character
```

filecopy2.c

```
#include <stdio.h>  
  
/* copy input to output; 1st version */  
int main() {  
    int c;  
  
    while ((c = getchar()) != EOF)  
        putchar(c);  
}
```

Character Counting

문자 세기

charcount.c

```
#include <stdio.h>

/* count characters in input; 1st version */
int main() {
    long nc;

    nc = 0;
    while (getchar() != EOF)
        ++nc;
    printf("%ld\n", nc);
}
```

Character Counting

문자 세기

charcount2.c

```
#include <stdio.h>

/* count characters in input; 2nd version */
int main() {
    double nc;

    for (nc = 0; getchar() != EOF; ++nc)
        ;
    printf("%.0f\n", nc);
}
```

Line Counting 줄 세기

linecount.c

```
#include <stdio.h>

/* count lines in input */
int main() {
    int c, nl;

    nl = 0;
    while ((c = getchar()) != EOF)
        if (c == '\n')
            ++nl;
    printf("%d\n", nl);
}
```

Word Counting 단어 세기

wordcount.c

```
#include <stdio.h>

#define IN 1    /* inside a word */
#define OUT 0   /* outside a word */

/* count lines, words, and characters in input */
int main() {
    int c, nl, nw, nc, state;

    state = OUT;
    nl = nw = nc = 0;
    while ((c = getchar()) != EOF) {
        ++nc;
        if (c == '\n')
            ++nl;
        if (c == ' ' || c == '\n' || c == '\t')
            state = OUT;
        else if (state == OUT) {
            state = IN;
            ++nw;
        }
    }
    printf("%d %d %d\n", nl, nw, nc);
}
```

white-space = {' ', '\n', '\t'}

black-space = all other chars

