시스템프로그래밍기초 실습

Ch4. Flow of Control

실습 예제 1) fib.c

```c
#include <stdio.h>
#define LIMIT 46

int main(void)
{
    long f0 = 0, f1 = 1, n, temp;
    printf("%7s%19s%29s\n%7s%19s%29s\n%7s%19s%29s\n",
        /* headings */
        "  ", "Fibonacci", "Fibonacci",
        " n", "  numbers", " quotient",
        "--", "---------", "---------");
    printf("%7d%19d\n%7d%19d\n", 0, 0, 1, 1); /* 1st 2 cases */
    for (n = 0; n <= LIMIT; ++n) {
        temp = f1;
        f1 += f0;
        f0 = temp;
        printf("%7ld%19ld%29.16f\n", n, f1, (double) f1 / f0);
    }
    return 0;
}
```

실습 예제 2) abs.c

```c
#include <stdio.h>

int main(void)
{
    int num, abs;
    printf("Type an integer: ");
    scanf("%d", &num);

    num>=0 ? printf("positive\n") : printf("negative\n");
    abs=num>=0 ? num : num*(-1);
    printf("abs: %d\n", abs);

    return 0;
}
```

실습 예제 3) switch.c

```c
#include <stdio.h>
#include <ctype.h>   //for tolower()

int main(void)
{
    char ch;
    printf("Type character...\n");
    while(1)
    {
        ch = tolower(getchar());
        if (ch == 'q') break;

        switch (ch)
        {
            case 'a':
                printf("You typed A.\n");
                break;
            case 'b':
                printf("You typed B.\n");
                break;
            case 0x63:
                printf("You typed C.\n");
                break;
            case 0x1b:
                printf("You typed ESC.\n");
                break;
        }
    }
    return 0;
}
```

과제 1) gcd.c

```c
#include <stdio.h>

int gcd(int a, int b)
{
    /* code here */
}


int main(void)
{
    printf("gcd(10, 15) = %d\n", gcd(10, 15));
    printf("gcd(125, 13) = %d\n", gcd(125, 13));
    printf("gcd(625, 225) = %d\n", gcd(625, 225));
    printf("gcd(6840, 324) = %d\n", gcd(6840, 324));
}
```

GCD 추가설명 – 유클리드 호제법

Two integer A, B. (A > B)

A is divided by B,

A mod B = C

- A is dividend
- B is the divisor
- C is the remainder

Is the remaider C = 0 ?
No. then continue.

B mod C = D

- B is dividend
- C is the divisor
- D is the remainder

Is the remaider D = 0 ?
Yes. then C is the GCD.

예)

A = B * quotient + remainder

32 % 5

32 = 5 * 6 + 2

5 % 2

5 = 2 * 2 + 1

2 % 1

2 = 1 * 2 + 0

remainder is 0, GCD is 1.