Increment and Decrement Operators

- Increment Operators

```c
#include <stdio.h>
#define N 10
int main()
{
    int a, b;
    b = a = 0;
    while (a++<10) {
        printf("%d ", a);
    }
    printf("\n");
    while (++b<10) {
        printf("%d ", b);
    }
    printf("\n");
    return 0;
}
```

```
1 2 3 4 5 6 7 8 9 10
1 2 3 4 5 6 7 8 9
```

Increment and Decrement Operators

- Conditional Operator

```c
#include <stdio.h>

int main()
{
    int a1, b1, x1;
    int a2, b2, x2;
    a2 = a1 = 10;
    b2 = b1 = 15;
    x1 = (a1 > b1) ? a1 : b1;
    if (a2 > b2) {
        x2 = a2;
    }
    else {
        x2 = b2;
    }
    printf("%d, %d\n", x1, x2);
    return 0;
}
```

```
15, 15
```

Increment and Decrement Operators

- Conditional Operator

```c
#include <stdio.h>

int main()
{
    int a, b, c, d;
    a = 15;
    b = 10;
    c = ++a - b;
    printf("a = %d b = %d c = %d\n", a, b, c);
    d = b++ + a;
    printf("a = %d b = %d d = %d\n", a, b, d);
    printf("a/b = %d\n", a/b);
    printf("a%%b = %d\n", a%b);
    printf("a *= b = %d\n", a*=b);
    printf("%d\n", (c>d) ? 1:0);
    printf("%d\n", (c<d) ? 1:0);
    return 0;
}
```

```
a = 16 b = 10 c = 6
a = 16 b = 11 d = 26
a/b = 1
a%b = 5
a *= b = 176
0
1
```

Arithmetic Expressions

Algebraic Expression	C Expression
$a \times b - c$	a*b-c
$(m + n)(x + y)$	(m+n) * (x+y)
$\left(\frac{ab}{c}\right)$	a*b/c
$3x^2 + 2x + 1$	3*x*x + 2*x + 1
$\left(\frac{x}{y}\right) + c$	x/y+c

Evaluation of Expressions

```c
// Worked-Out Problem 4.4
#include <stdio.h>
int main()
{
    float a, b, c, x, y, z;
    a = 9;
    b = 12;
    c = 3;
    x = a - b / 3 + c * 2 - 1;
    y = a - b / (3 + c) * (2 - 1);
    z = a - (b / (3 + c) * 2) - 1;
    printf("x = %f\n", x);
    printf("y = %f\n", y);
    printf("z = %f\n", z);
    return 0;
}
```

```
x = 10.000000
y = 7.000000
z = 4.000000
```

```c
// Worked-Out Problem 4.4
#include <stdio.h>
#include <conio.h>
int main()
{
    int a;
    a = 5<=8 && 6!=5;
    printf("%d", a);
    return 0;
}
```

```
1
```

Evaluation of Expressions

```c
// Worked-Out Problem 4.7
#include <stdio.h>
int main()
{
    float sum;
    int n;
    sum = 0;
    for (n=1; n<=10; ++n) {
        sum = sum + 1/(float)n;
        printf("%2d %6.4f\n", n, sum);
    }
    return 0;
}
```

```
 1 1.0000
 2 1.5000
 3 1.8333
 4 2.0833
 5 2.2833
 6 2.4500
 7 2.5929
 8 2.7179
 9 2.8290
10 2.9290
```