Day05 (H1)

20150815

if else
for loop
relational operators

```
int a = 7 / 3;
int b = 7 % 3;

System.out.print  ("a=");
System.out.println( a );

System.out.print  ("b=");
System.out.println( b );
```

int a = 7 / 3;

int b = 7 % 3;

정수 나눗셈 { 몫 (정수) / (정수)
나머지 (정수) % (정수)

② int a ;
a = 7 / 3;

① int b ;
b = 7 % 3;

int a = 7 / 3;

int b = 7 % 3;

7 = 2 x 3 + 1
몫 나머지

관계 연산자 Relational Operator

계산 값 → 계산결과
- true
- false

관계 연산자

a	==	b
a	!=	b
a	>	b
a	<	b
a	>=	b
a	<=	b

연산 결과는
- 참 → true
- 거짓 → false

boolean data type

```
int x = -99;

System.out.println("x="      + x     );
System.out.println("(x>0)=" + (x>0));
System.out.println("(x<0)=" + (x<0));
```

```
x=-99
(x>0)=false
(x<0)=true
```

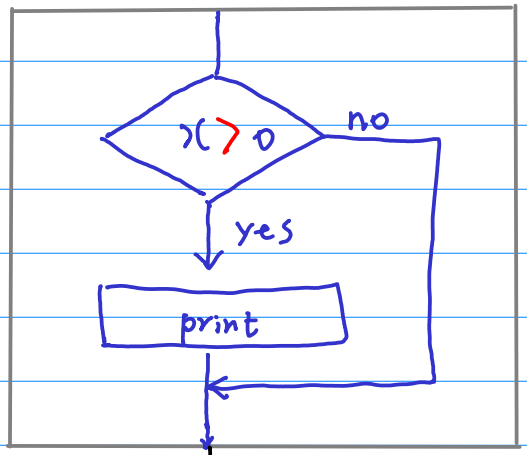
```java
int x = -99;

System.out.println("x=" + x);

if (x > 0) {
    System.out.println("x is positive.");
}
```

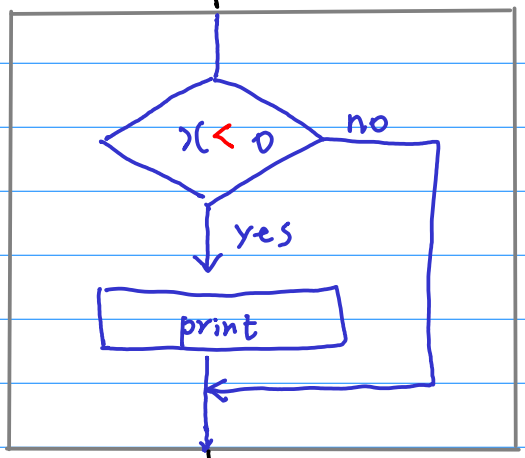
if true

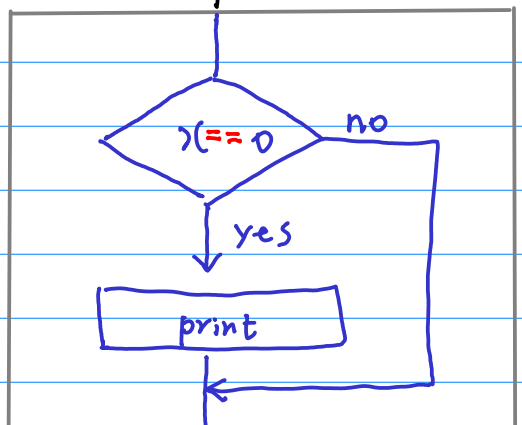
if false

```java
int x = 100;

if (x > 0) {
    System.out.println("x is positive.");
}

x = -99;

if (x < 0) {
    System.out.println("x is negative.");
}
```

```java
    int x = -99;
//  int x = 100;
//  int x = 0;

    if (x >  0) System.out.println("x is positive.");

    if (x <  0) System.out.println("x is negative.");

    if (x == 0) System.out.println("x is zero.");
```



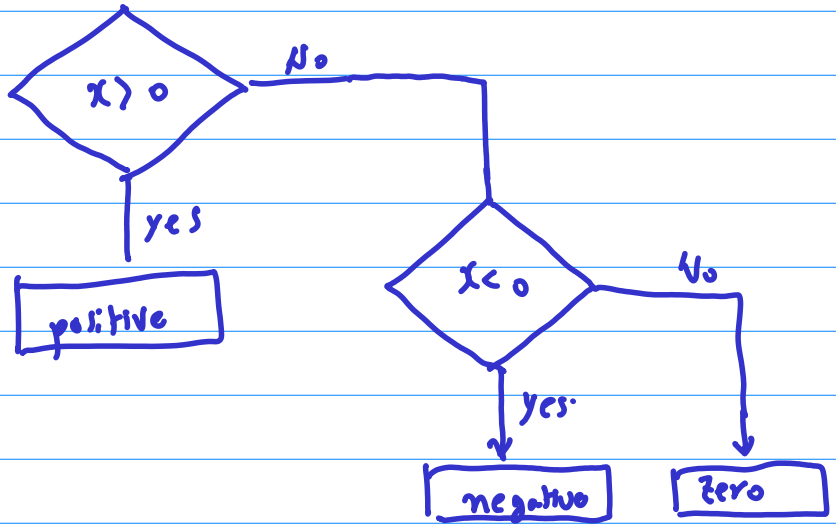




```java
if (x >  0) System.out.println("x is positive.");
else {
    if (x <  0) System.out.println("x is negative.");
    else        System.out.println("x is zero.");
}
```

(x > 0)

(x ≤ 0)



항상 수행

```
if (true) System.out.println("always true");

if (false) System.out.println("always false");
```

절대로 수행되지 않음.

boolean data type;

```
int     x = 100;
boolean b = true;

// b = 0;
b = true;
b = false;
b = (x > 0);
b = x > 0;
System.out.println(b);
```

b = x > 0

우선순위?

* / + -

b = (x > 0)

먼저 계산

다음에 할당

```java
int x = 100;

if ( (x%2) == 0) System.out.println("x is even");
else             System.out.println("x is odd");
```

(x % 2) == 0

x를 2로 나눈 나머지가 0과 같은가?

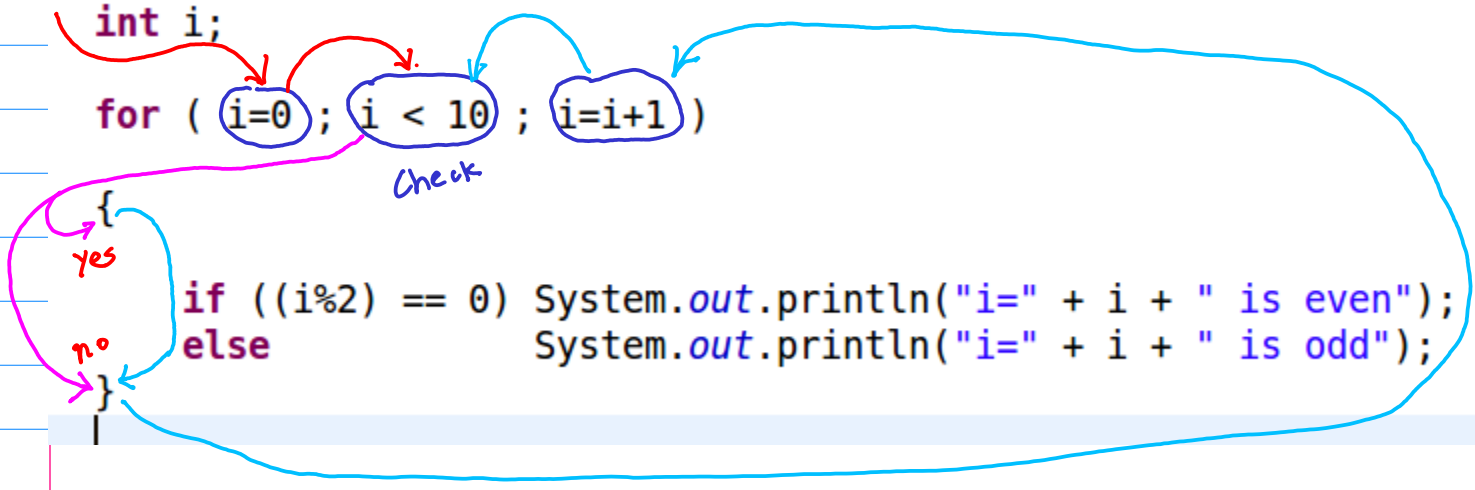
⇒ 짝수인가?

x % 2 == 0

우선순위 %가 우선임

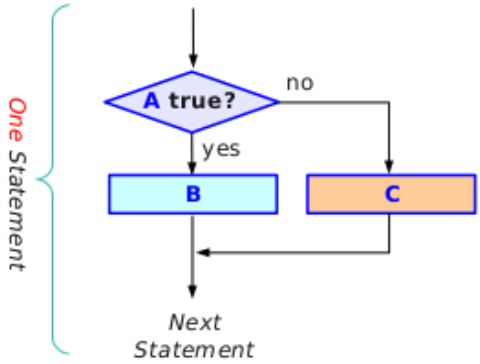
For Loop

init ; check ; update

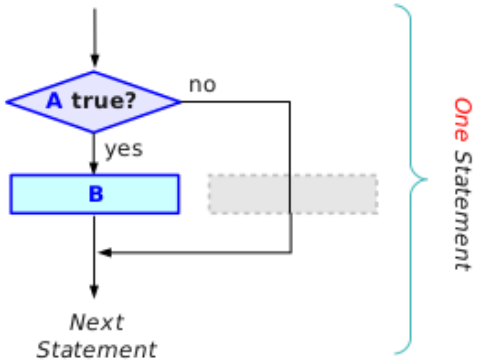



```
i=0 is even
i=1 is odd
i=2 is even
i=3 is odd
i=4 is even
i=5 is odd
i=6 is even
i=7 is odd
i=8 is even
i=9 is odd
```

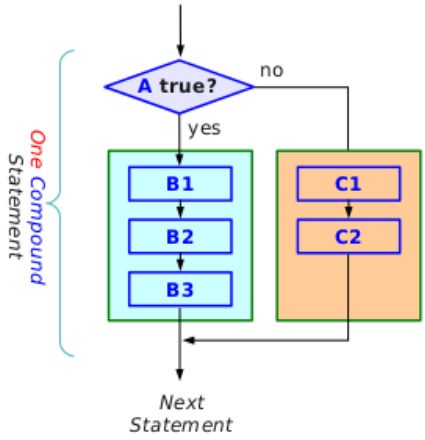
```
if ( A ) B;
else     C;
```



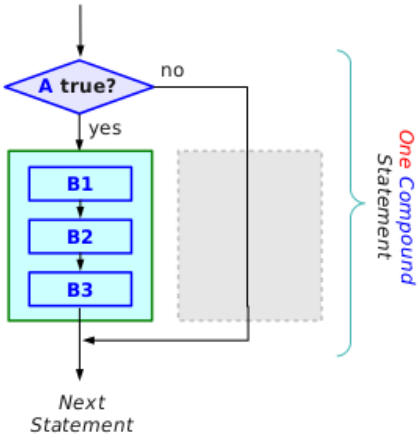

```
if ( A ) B;
```

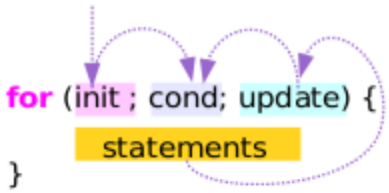


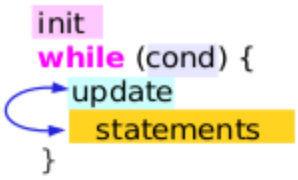

```
if ( A ) { B1; B2; B3; }
else     { C1; C2; }
```



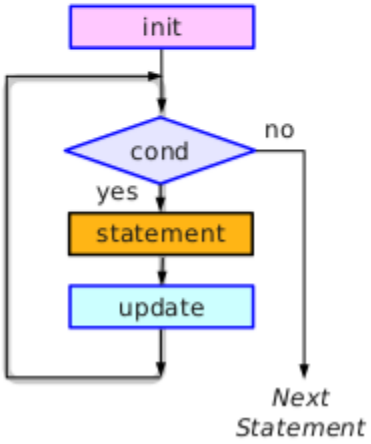

```
if ( A ) { B1; B2; B3; }
```

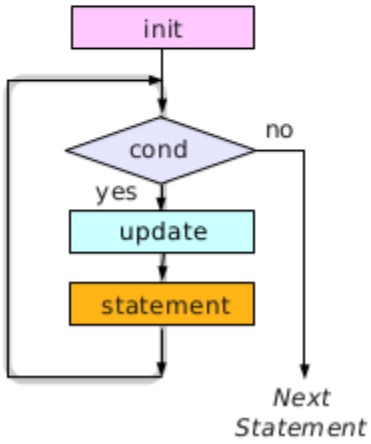


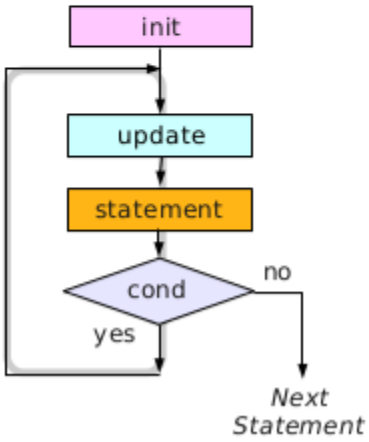

for (init ; cond; update) {
statements
}


init
while (cond) {
update
statements
}


init
do {
update
statements
} while (cond);


init
cond
no
yes
statement
update
Next
Statement


init
cond
no
yes
update
statement
Next
Statement


init
update
statement
cond
no
yes
Next
Statement

$i = 2;$

$i = i + 1;$

$i : 2 + 1$ update

$i \leftarrow 3$

$i \leftarrow 3$

old state $S = 2$

$S = S + n;$

$S = 2 + n$

new state $S \leftarrow 2 + n$

`++i`	`i = i+1;`
`--i`	`i = i-1;`
`i++`	`i = i+1;`
`i--`	`i = i-1;`

```java
int n, S;

S=0;
for (n=1; n<=5; ++n) {
    System.out.println("old S=" + S);
    System.out.println("    n=" + n);

    S = S + n;

    System.out.println("new S=" + S);
    System.out.println("--------------------");
}
```

$S = 0 + 1$

new S old S n=1

$S = (0+1) + 2$

new S old S n=2

$S = (0+1+2) + 3$

new S old S n=3

$S = (0+1+2+3) + 4$

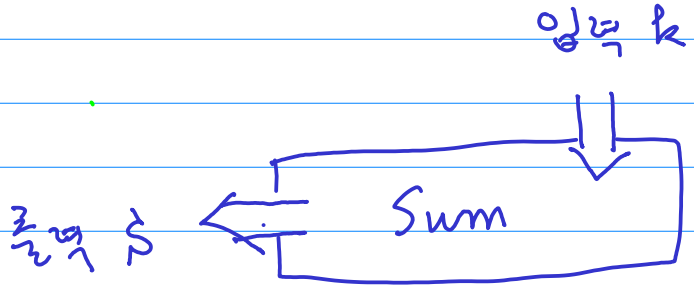
new S old S n=4

$S = (0+1+2+3+4) + 5$

new S old S n=5

making a function

```
public static int Sum(int k) {
    int n, S;

    S=0;
    for (n=1; n<=k; ++n) {
        S = S + n;
    }
    return S;
}
```



main 에서 call

```
int S;

S = Sum(10);

System.out.println("S=" + S);

System.out.println("Sum(10)=" + Sum(10) );
```

```
System.out.println("Sum(1)=" + Sum(1) );
System.out.println("Sum(2)=" + Sum(2) );
System.out.println("Sum(3)=" + Sum(3) );
System.out.println("Sum(4)=" + Sum(4) );
System.out.println("Sum(5)=" + Sum(5) );
```

```
int i;

for (i=1; i<=10; ++i) {
    System.out.println("Sum(" + i + ")=" + Sum(i) );
}
```