

**CHAPTER  
ANS-06**

**คำสั่งแบบทำซ้ำและวนซ้ำ (ตอนที่ 2)**  
(Iteration and Looping Statements: for)

**โจทย์ข้อที่ 1**

เกิดการซ้ำแบบไม่รู้จบ (Infinite loop)

ไม่รู้จักตัวแปร x และ a ที่ปรากฏในคำสั่งแสดงผล  
(บรรทัดสุดท้าย)

**โจทย์ข้อที่ 2**

1) วงจร (Loop) a ทำทั้งหมดกี่รอบ (1 คะแนน)

90 รอบ

2) วงจร (Loop) c ทำทั้งหมดกี่รอบ (1 คะแนน)

2 รอบ

3) วงจร (Loop) r ทำทั้งหมดกี่รอบ (1 คะแนน)

20 รอบ

**โจทย์ข้อที่ 3**

3.1)

```
int x = 0;
for (int i = 5; i <= 40; i += 5) {
    x += i;
}
```

3.2)

```
int x = 0, y;
for (int i = 1; i <= 15; i++) {
    y = 2;
    for (int j = 1; j < i; j++)
        y *= 2;
    x += y - 1;
}
```

3.3)

```
double x = 1.0;
for (int i = 2; i <= 30; i++) {
    if (i % 2 == 0)
        x += 1.0 / i;
    else
        x += -1.0 / i;
}
```

4) ผลลัพธ์ที่แสดงทั้งหมดคือ (5 คะแนน)

```
123456789
12345678
1234567
123456
12345
1234
123
12
1
```

```
n = 114
123456789
12345678
1234567
123456
12345
1234
123
12
1
n = 342
```

**โจทย์ข้อที่ 4**

```
i = 10
j = 10
k = 2
sum = 165
```

**โจทย์ข้อที่ 5**

```
87543200 is not a valid ID number.
87542400 is not a valid ID number.
Thank you.
Your valid ID number is 87542300
```

**โจทย์ข้อที่ 6**

```
Enter message here : KCUL
K
CK
UCK
LUCK
KCUL after process is : LUCK
```

```
Enter message here : DOOG
D
OD
OOD
GOOD
DOOG after process is : GOOD
```

**โจทย์ข้อที่ 7**

```
import java.util.Scanner;
public class Test {
    public static void main(String arg[] ) {
        Scanner kb = new Scanner(System.in);
        System.out.print("Enter n : ");
        int n = kb.nextInt();
        for (int i = 1; i <= n; i++) {
            for (int j = 1; j <= n - i; j++)
                System.out.print(" ");
            for (int j = 1; j <= (2 * i - 1); j++)
                System.out.print("*");
            System.out.println();
        } //End of for i
    }
}
```

**โจทย์ข้อที่ 8**

```
public class Test {
    public static void main(String arg[] ) {
        System.out.println("X\tX^2\tX^3\tX^4\tX^5");
        for (int x = 1; x <= 9; x++) {
            long xMul = x;
            System.out.print(xMul + "\t");
            for (int i = 2; i <= 5; i++) {
                xMul *= x;
                System.out.print(xMul + "\t");
            }
            System.out.println();
        }
    }
}
```

**โจทย์ข้อที่ 9**

```
public class Test {
    public static void main(String arg[]) {
        System.out.println("X\tY\tZ\tS");
        for (int x = 1; x <= 3; x++) {
            for (int y = 5; y <= 20; y += 5) {
                for (int z = 2; z <= 22; z += 2) {
                    int dx = 9, dy = 1, dz = 8;
                    long s = 0;
                    for (int n = 17; n >= 1; n -= 2) {
                        s += n * Math.pow(x, dx) * Math.pow(y, dy) * Math.pow(z, dz);
                        dx--;
                        dy++;
                        dz--;
                    } //End of for n
                    System.out.println(x + "\t" + y + "\t" + z + "\t" + s);
                } //End of for z
            } //End of for y
        } //End of for x
    }
}
```

**โจทย์ข้อที่ 10**

```
for (int i = 1; i <= 100; i++) {
    for (int j = 1; j <= 100; j++) {
        if (j <= (100 - i))
            System.out.print(String.format("%4c", ' '));
        else
            System.out.print(String.format("%4d",
                j-(100-i)));
    } //End of for j
    System.out.println();
} //End of for i
```

**โจทย์ข้อที่ 11**

```
number = 1
i = 14
sum = 12
```

```
int sum = 0 ;
int i = 0, number = 0;
for (i = 10; i <= 10; i += 4) {
    i += 2;
    number++;
    sum += i;
    i -= 2;
    for (; number >= i; number++) {
        sum += i;
        i -= 2;
    }
}
System.out.println("number = " + number);
System.out.println("i = " + i);
System.out.println("sum = " + sum);
```

**โจทย์ข้อที่ 12**

```
0
1
2
4
End
```

```
0
1
2
Infinite Loop
```

**โจทย์ข้อที่ 13**

```
0
1
2
End
```

```
0,0
0,1
0,2
End 2
1,0
End 1
```

**โจทย์ข้อที่ 14**

```
0
10
1
2
8
3,7
```

**โจทย์ข้อที่ 15**

```
1,12,24
2,6,12
3,11,23
4,1,3
5,12,25
```

**CHAPTER  
ANS-07**

**อาเรย์ 1 มิติ และ อาเรย์ 2 มิติ  
(1-Dimensional and 2-Dimensional Arrays)**

โจทย์ข้อที่ 1

```
3
10
15
Index Out of Bounds
16
```

โจทย์ข้อที่ 2

1. `int num[] = new int[100];`
2. `int nDigit[] = new int[7];`
3. `double grade[] = new double[451];`
4. `boolean matrix[][] = new boolean[5][8];`
5. `String namePoint[][] = new String[6][6];`

โจทย์ข้อที่ 3

1. `int x = num[50];`
2. `char c = code[59];`
3. `int var1 = big[0][1];`
4. `int var2 = big[6][4];`
5. `String s1 = sName[0][9];`
6. `String s2 = sName[0][2];`

โจทย์ข้อที่ 4

```
n1[0] = 0
```

```
n2[0] = 0.0
```

```
n3[0] = 0.0f
```

```
n4[0] = false
```

```
n5[0] = \u0000
```

```
n6[0] = null
```

โจทย์ข้อที่ 5

```
10
1
0
6
0
8
9
0
```

ไม่สามารถประกาศอาเรย์เป็น `a = {1,2,3,4};`  
ต้องแก้ไขใหม่เป็น `int a[] = {1,2,3,4};`

```
0 0 0
0 0 0
0 0 0
[[I@190d11
0 0 0
0 0 0
0 1 2
1
3
```

ไม่มีตำแหน่ง `b[1][1]` ในอาเรย์ `b`

```
6
```

```
0
7
7
10
9
16
```

ไม่มีอาเรย์ตำแหน่งที่ `a[99]` และ `b[99]`

โจทย์ข้อที่ 6

```
12987654310
```

โจทย์ข้อที่ 7

```
1
2 3
4 5 6
7 8 9 10
11 12 13 14 15
```

โจทย์ข้อที่ 8

```
0
7 8
4 5 6
0 1 2 3
0 0 0 0 0
0 0 0 0 0 0
```

โจทย์ข้อที่ 9

```
import java.util.Scanner;
public class PlasticDigitPlate {
    public static void main(String[] args) {
```

```

Scanner kb = new Scanner(System.in);
int m = 0, n = 0;
while (true) {
    System.out.print("Enter start number : ");
    n = kb.nextInt();
    System.out.print("Enter last number : ");
    m = kb.nextInt();
    if ((n >= 1) && (n < m) && (m <= 999)) { break; }
    else { System.out.println("=== Please enter again! ==="); }
}
int digit[] = new int[10];
for (int i = n; i <= m; i++) {
    String s = Integer.toString(i);
    for (int j = 0; j < s.length(); j++) {
        int x = Character.digit(s.charAt(j), 10);
        if (x == 0) { digit[0]++; }
        else if (x == 1) { digit[1]++; }
        else if (x == 2) { digit[2]++; }
        else if (x == 3) { digit[3]++; }
        else if (x == 4) { digit[4]++; }
        else if (x == 5) { digit[5]++; }
        else if (x == 6) { digit[6]++; }
        else if (x == 7) { digit[7]++; }
        else if (x == 8) { digit[8]++; }
        else { digit[9]++; }
    }
}
for (int i = 0; i < 10; i++) {
    System.out.println("Amount of NO." + i + " : " + digit[i]);
}
}

```

โจทย์ข้อที่ 10

```

public class AverageRandomNumber {
    public static void main(String arg[]) {
        int x;
        int num[] = new int[50];
        for (int i = 0; i < 50; i++) {
            x = (int) (Math.random() * 1000);
            if (x > 400 && x < 800) {
                if (i == 0) { num[0] = x;
                } else {
                    boolean flag = true;
                    for (int j = 0; j < i; j++)
                        if (num[j] == x) { flag = false; break; }
                    if (flag == true) {
                        num[i] = x;
                    } else {
                        i--;
                    }
                }
            }
        }
        //End of if flag
        //End of if i
        } else { i--; } //End of if x
    } //End of for
    int sum = 0;
    for (int i = 0; i < 50; i++) {
        System.out.println((i + 1) + " " + num[i] + " ");
        sum += num[i];
    }
    System.out.println("Average : " + (sum / 50.0));
} //End of method main
}

```

โจทย์ข้อที่ 11

```

import java.util.Scanner;
public class MatrixRemainder {
    public static void main(String[] args) {
        Scanner kb = new Scanner(System.in);
        int x[][] = new int[4][3];
        int y[][] = new int[4][3];
        int modxy[][] = new int[4][3];

        System.out.println("==== Elements of matrix x =====");
        for (int i = 0; i < 4; i++) {
            for (int j = 0; j < 3; j++) {
                System.out.print("Enter rows " + (i+1) + " column " + (j+1) + " : ");
                x[i][j] = kb.nextInt();
            }
        }

        System.out.println("==== Elements of matrix y =====");
        for (int i = 0; i < 4; i++) {
            for (int j = 0; j < 3; j++) {
                System.out.print("Enter rows " + (i+1) + " column " + (j+1) + " : ");
                y[i][j] = kb.nextInt();
            }
        }

        System.out.println("==== Matrix x =====");
        for (int i = 0; i < 4; i++) {
            for (int j = 0; j < 3; j++)
                System.out.print(String.format("%4d", x[i][j]));
            System.out.println();
        }

        System.out.println("==== Matrix y =====");
        for (int i = 0; i < 4; i++) {
            for (int j = 0; j < 3; j++)
                System.out.print(String.format("%4d", y[i][j]));
            System.out.println();
        }

        System.out.println("==== Matrix modxy =====");
        for (int i = 0; i < 4; i++) {
            for (int j = 0; j < 3; j++)
                System.out.print(String.format("%4d", (x[i][j] % y[i][j])));
            System.out.println();
        }
    } //End of main method
}

```

โจทย์ข้อที่ 12

```

import java.util.Scanner;
public class ThreeMaxMin {
    public static void main(String[] args) {
        Scanner kb = new Scanner(System.in);
        int n = 1;
        for (int i = 1; i <= 1; i++) { //Input n
            System.out.print("Enter n : ");
            n = kb.nextInt();
            if (n < 15) {
                System.out.print("Repeat ");
                i--;
            }
        } //End of for
    }
}

```

```

int num[] = new int[n];
for (int i = 0; i < n; i++) { //Input number
    System.out.print("Number NO." + (i + 1) + " : ");
    num[i] = kb.nextInt();
} //End of for
int max[] = {num[0], num[0], num[0]};
int min[] = {num[0], num[0], num[0]};
for (int x = 1; x < n; x++) {
    if (num[x] >= max[0]) { //Find Max Number
        max[2] = max[1];
        max[1] = max[0];
        max[0] = num[x];
    } else if (num[x] >= max[1]) {
        max[2] = max[1];
        max[1] = num[x];
    } else if (num[x] >= max[2]) {
        max[2] = num[x];
    } else { /*don't do anything*/ }
    if (num[x] <= min[0]) { //Find Min Number
        min[2] = min[1];
        min[1] = min[0];
        min[0] = num[x];
    } else if (num[x] <= min[1]) {
        min[2] = min[1];
        min[1] = num[x];
    } else if (num[x] <= min[2]) {
        min[2] = num[x];
    } else { /*don't do anything*/ }
} //End of for

System.out.println("List of Max Number : " + max[0] + ", " + max[1] +
    ", " + max[2]);
System.out.println("List of Min Number : " + min[0] + ", " + min[1] +
    ", " + min[2]);
}
}

```

โจทย์ข้อที่ 13

```

int max[] = { data[0][0], data[0][0], data[0][0], data[0][0] };
for (int i = 0; i < 30; i++) {
    for (int j = 0; j < 40; j++) {
        if (table[i][j] > max[1]) {
            if (i == 0 && j == 0) continue;
            if (data[i][j] >= max[0]) {
                max[3] = max[2];
                max[2] = max[1];
                max[1] = max[0];
                max[0] = data[i][j];
            } else if (data[i][j] >= max[1]) {
                max[3] = max[2];
                max[2] = max[1];
                max[1] = data[i][j];
            } else if (data[i][j] >= max[2]) {
                max[3] = max[2];
                max[2] = data[i][j];
            } else if (data[i][j] >= max[3]) {
                max[3] = data[i][j];
            } else { /*don't do anything*/ }
        } //End if
    } //End for j
} //End for i

```

โจทย์ข้อที่ 14

14.1

```

import java.util.Scanner;
import java.util.Arrays;
public class TwoArrays {
    public static void main(String[] args) {
        Scanner kb = new Scanner(System.in);
        int m[] = new int[(int) (Math.random() * 10) + 1];
        int n[] = new int[(int) (Math.random() * 10) + 1];

        System.out.println("==== Array 1 =====");
        for (int i = 0; i < m.length; i++) {
            System.out.print("Array 1 Index " + i + " = ");
            m[i] = kb.nextInt();
        }

        System.out.println("==== Array 2 =====");
        for (int i = 0; i < n.length; i++) {
            System.out.print("Array 2 Index " + i + " = ");
            n[i] = kb.nextInt();
        }

        String mArray = m[0] + "";
        for (int i = 1; i < m.length; i++)
            mArray += ", " + m[i];
        String nArray = n[0] + "";
        for (int i = 1; i < n.length; i++)
            nArray += ", " + n[i];
        System.out.println("m[] = { " + mArray + " }");
        System.out.println("n[] = { " + nArray + " }");

        if (m.length != n.length) {
            System.out.println("Arrays are not equal!");
        } else {
            for (int i = 0; i < m.length; i++) {
                if (m[i] != n[i]) {
                    System.out.println("Arrays are not equal!");
                    break;
                }
                if ((i + 1) == m.length)
                    System.out.println("Arrays are equal!");
            } //End for i
        } //End if
    } //End method main
}

```

14.2

```

if (Arrays.equals(m, n))
    System.out.println("Arrays are equal!");
else
    System.out.println("Arrays are not equal!");

```

**CHAPTER  
ANS-08**

**เม็ท็อดและการเรียกใช้เม็ท็อด  
(Methods and Calling of Methods)**

โจทย์ข้อที่ 1

- 1.1)
- 1.2)
- 1.3)
- 1.4)
- 1.5)
- 1.6)

โจทย์ข้อที่ 2

1. metA1 ()-metA5 (), metB1 ()-metB4 (), metC3 (), metD1 (), metD3 ()
2. metA1 (), metA4 (), metA5 ()
3. metB1 (), metB2 (), metB3 (), metB4 ()
4. metC3 ()
5. metD1 (), metD3 ()
6. เม็ท็อดทุกตัวจากคลาสใดๆ สามารถเรียกใช้เม็ท็อด metA1 () ได้ทั้งหมด (เป็นแบบ public)
7. metA1 (), metA2 (), metA3 (), metA4 (), metA5 ()
8. metA1 ()-metA5 (), metB1 ()-metB5 (), metC1 ()-metC5 ()
9. ไม่มีเม็ท็อดใดในคลาส C ที่เรียกใช้เม็ท็อด metB3 () ได้เลย
10. ไม่มีเม็ท็อดใดในคลาส C ที่เรียกใช้เม็ท็อด metB4 () ได้เลย
11. metA1 ()-metA5 (), metB1 ()-metB5 ()
12. void
13. String
14. int (แต่มีโครงสร้างข้อมูลเป็นแบบอาเรย์)
15. เรียกใช้ได้ เพราะว่าเม็ท็อด metC3 () เป็นแบบ public static
16. เรียกใช้ไม่ได้ เพราะว่าเม็ท็อด metB2 () เป็นแบบ public แต่ไม่เป็นแบบ static
17. เรียกใช้ไม่ได้ เพราะว่าเม็ท็อด metB5 () เป็นแบบ private

โจทย์ข้อที่ 3

```
public static double power(int x, int y) {
    int p = 1, d = y;
    if (d < 0) d = -d;
    for (int i = 0; i < d; i++) p *= x;
    if (y < 0) return 1.0 / p; else return 1.0 * p;
}
```

โจทย์ข้อที่ 4

```
public static String grade(int x) {
    if (x >= 78) return "A";
    else if (x >= 72) return "B+";
    else if (x >= 67) return "B";
    else if (x >= 60) return "C+";
    else if (x >= 54) return "C";
    else if (x >= 49) return "D+";
    else if (x >= 42) return "D";
    else return "F";
}
```

โจทย์ข้อที่ 5

```
public static int[] appendArray(int a[], int b[]) {
    int ab[] = new int[a.length + b.length];
    int c = 0;
    for (int i = 0; i < a.length; i++)
        ab[c++] = a[i];
    for (int i = 0; i < b.length; i++)
        ab[c++] = b[i];
    return ab;
}
```

โจทย์ข้อที่ 6

```
public static int[] getVowels(String s) {
    s = s.toLowerCase();
    int vowel[] = new int[5];
    for (int i = 0; i < s.length(); i++) {
        if (s.charAt(i) == 'a') { vowel[0]++; }
        else if (s.charAt(i) == 'e') { vowel[1]++; }
        else if (s.charAt(i) == 'i') { vowel[2]++; }
        else if (s.charAt(i) == 'o') { vowel[3]++; }
        else if (s.charAt(i) == 'u') { vowel[4]++; }
        else { }
    }
    return vowel;
}
```

โจทย์ข้อที่ 7

```
public static String removeChars(String s, char c) {
    String newStr = "";
    for (int i = 0; i < s.length(); i++)
        if (s.charAt(i) != c) newStr += s.charAt(i);
    return newStr;
}
```

โจทย์ข้อที่ 8

A : 12.0 B : 14	ob.area(9,2) = 18.0
Invalid Number	borders(2,7) = 18
Error (Input Mismatch)	checkNum(0) = false

## โจทย์ข้อที่ 9

```
public class WordCount {
    public static String[] splitString(String s) {
        int len = s.length();
        String tempWord[] = new String[len];
        int i = 0;
        for (; i < len; i++) {
            if (s.indexOf(" ") > 0) {
                tempWord[i] = s.trim().substring(0, s.indexOf(" "));
                s = s.substring(s.indexOf(" ") + 1, s.length());
            } else {
                tempWord[i] = s.trim().substring(0, s.length() - 1);
                break;
            }
        }
        String word[] = new String[i + 1];
        for (int k = 0; k < word.length; k++)
            word[k] = tempWord[k];
        return word;
    }

    public static void main(String []args) {
        String s[] = splitString("I need to get A Java so much.");
        System.out.println("Number of words : " + s.length);
        for (int i = 0; i < s.length; i++) System.out.println(s[i]);
    }
}
```

## โจทย์ข้อที่ 10

```
import java.util.Scanner;
public class MaxMember {
    public static void main(String[] args) {
        double a[][] = new double[8][9];
        double b[][] = new double[8][9];
        a = inputMatrix(8, 9);
        b = inputMatrix(8, 9);
        String s[] = findMax(a, b);
        System.out.println("Max Value: " + s[0]);
        System.out.println("Row: " + s[1]);
        System.out.println("Column: " + s[2]);
    }

    public static double[][] inputMatrix(int x, int y) {
        Scanner kb = new Scanner(System.in);
        double a[][] = new double[x][y];
        for (int i = 0; i < x; i++) {
            for (int j = 0; j < y; j++) {
                System.out.print("Enter Matrix[" + i + "][" + j + "]: ");
                a[i][j] = kb.nextDouble();
            }
        }
        return a;
    }

    public static String[] findMax(double x[][], double y[][]) {
        double max = 0.0;
        int row = 0, column = 0;
        String val[] = new String[3];
        for (int i = 0; i < x.length; i++) {
            for (int j = 0; j < x[0].length; j++) {
                double f = x[i][j] + y[i][j];
                if (i == 0 && j == 0) {
                    max = f;
                    row = 0;
                    column = 0;
                }
            }
        }
    }
}
```

```
    } else {
        if (f > max) {
            max = f;
            row = i;
            column = j;
        }
    }
}
}

val[0] = Double.toString(max);
val[1] = Integer.toString(row);
val[2] = Integer.toString(column);
return val;
}
```

## โจทย์ข้อที่ 11

```
import java.util.Scanner;
public class DataExper {
```

```
    public static double max(double t[][]) {
```

```
        double maxData = t[0][0];
        for (int i = 0; i < t.length; i++)
            for (int j = 0; j < t[i].length; j++)
                if (t[i][j] > maxData) maxData = t[i][j];
        return maxData;
    }
```

```
    //End of max()
```

```
    public static double min(double t[][]) {
```

```
        double minData = t[0][0];
        for (int i = 0; i < t.length; i++)
            for (int j = 0; j < t[i].length; j++)
                if (t[i][j] < minData) minData = t[i][j];
        return minData;
    }
```

```
    //End of min()
```

```
    public static double avgRange(double t[][]) {
```

```
        return (max(t) - min(t)) / 2.0;
```

```
    //End of avgRange()
```

```
    public static double meanOfMonth(double t[][], int m) {
```

```
        double sum = 0.0;
        int i = (m + 3) % 12;
        for (int j = 0; j < t[i].length; j++)
            sum += t[i][j];
        return sum / t[i].length;
    }
```

```
    //End of meanOfMonth()
```

```
    public static double dataOfDay(double t[][], int d, int m) {
```

```
        return t[(m + 3) % 12][d - 1];
    }
```

```
    //End of dataOfDay()
```

```
public static void main(String[] args) {
```

```
Scanner kb = new Scanner(System.in);
double test[][] = new double[12][];
for (int i = 0; i < 12; i++) {
    if (i == 5)
        test[i] = new double[29];
    else if (i == 0 || i == 2 || i == 7 || i == 9)
        test[i] = new double[30];
    else
        test[i] = new double[31];
    for (int j = 0; j < test[i].length; j++) {
        if (i == 0) System.out.print("Sep " + (j+1) + ", 2007: ");
        else if (i == 1) System.out.print("Oct " + (j+1) + ", 2007: ");
        else if (i == 2) System.out.print("Nov " + (j+1) + ", 2007: ");
        else if (i == 3) System.out.print("Dec " + (j+1) + ", 2007: ");
        else if (i == 4) System.out.print("Jan " + (j+1) + ", 2008: ");
        else if (i == 5) System.out.print("Feb " + (j+1) + ", 2008: ");
        else if (i == 6) System.out.print("Mar " + (j+1) + ", 2008: ");
        else if (i == 7) System.out.print("Apr " + (j+1) + ", 2008: ");
        else if (i == 8) System.out.print("May " + (j+1) + ", 2008: ");
        else if (i == 9) System.out.print("Jun " + (j+1) + ", 2008: ");
        else System.out.print("Aug " + (j + 1) + ", 2008 : ");
        test[i][j] = kb.nextDouble();
    }
}
//End of for j
//End of for i
//===== Method Call =====
System.out.println(max(test));
System.out.println(min(test));
System.out.println(avgRange(test));
System.out.println(meanOfMonth(test, 10));
System.out.println(dataOfDay(test, 13, 6));
```

```
} //End of main()
} //End of Class DataExper
```

โจทย์ข้อที่ 12

100  
2.0  
121  
56.25  
24  
49  
25.0  
4.0  
100  
2809

โจทย์ข้อที่ 13

5 and 6  
2.0 and 2.0  
5.0 and 5.0  
ABDCBDCB  
ftrue

**CHAPTER ANS-09** การเวียนเกิดและเมทอดแบบเวียนเกิด (Recursion and Recursive Method)

โจทย์ข้อที่ 1

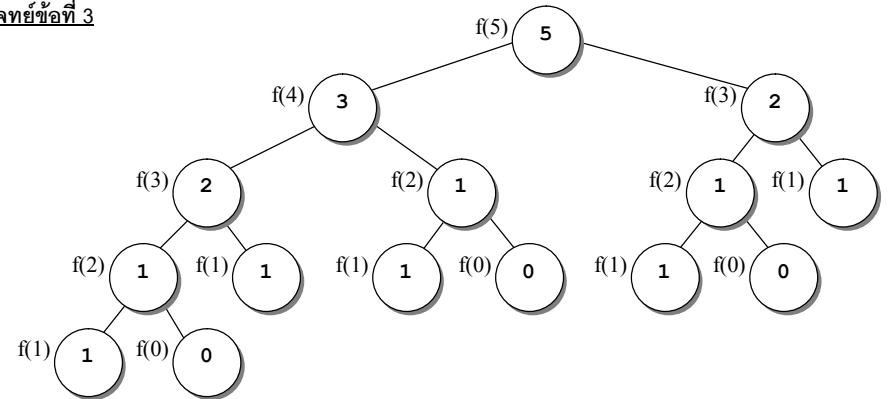
- กรณีพื้นฐานคือ  $a_n = 0$  ถ้า  $n \leq 0$
- กรณีเวียนเกิดคือ  $a_n = a_{n-1} + n$  ถ้า  $n > 0$

รอบที่	ค่า n	เรียก	ค่าที่ Return	ผลลัพธ์ที่ได้
1	6	a(6)	a(5) + 6	a(5) + 6
2	5	a(5)	a(4) + 5	a(4) + 5 + 6
3	4	a(4)	a(3) + 4	a(3) + 4 + 5 + 6
4	3	a(3)	a(2) + 3	a(2) + 3 + 4 + 5 + 6
5	2	a(2)	a(1) + 2	a(1) + 2 + 3 + 4 + 5 + 6
6	1	a(1)	a(0) + 1	a(0) + 1 + 2 + 3 + 4 + 5 + 6
7	0	a(0)	0	0 + 1 + 2 + 3 + 4 + 5 + 6 = <b>21</b>

โจทย์ข้อที่ 2

```
if (n < 2) return n;
return f(n-1) + f(n-2);
```

โจทย์ข้อที่ 3



โจทย์ข้อที่ 4

4.1

$$f(n) = \begin{cases} f(n-1) + (n^2 + 2n) & n = 1, 2, 3, \dots \\ 0 & n = 0 \text{ (Otherwise)} \end{cases}$$

4.2

```
public static int f(int n) {
    if (n < 1) return 0;
    else return f(n - 1) + Math.pow(n,n) + (2 * n);
}
```

โจทย์ข้อที่ 5

```
public static long fac(int n) {
    if (n < 2) return 1;
    return fac(n - 1) * n;
}
```

โจทย์ข้อที่ 6

```
public static void funny(int n) {
    if (n < 10) System.out.println(n);
    else {
        System.out.print(n % 10);
        funny(n / 10);
    }
}
```

โจทย์ข้อที่ 7

```
public static double c(int n){
    if(n < 0) return 0;
    if(n <= 1) return 1;
    return c(n-1)+0.5*c(n-2)*(n-1)/n-1;
}
```

โจทย์ข้อที่ 8

ค่า m	ค่า n				
	0	1	2	3	4
0	1	2	3	4	5
1	2	3	4	5	6
2	3	5	7	9	11

โจทย์ข้อที่ 9

```
public static int sumTen(int d[]) {
    if (d.length >= 1) {
        int arr[] = new int[d.length - 1];
        for (int i = 1; i < d.length; i++)
            arr[i - 1] = d[i];
        if (d[0] > 100) {
            return sumTen(arr) + 1;
        } else {
            return sumTen(arr) + 0;
        }
    }
    return 0;
}
```

โจทย์ข้อที่ 10 6 ครั้ง

โจทย์ข้อที่ 11

```
import java.util.Scanner;
public class Test {
    public static void main(String[] args) {
        Scanner kb = new Scanner(System.in);
        System.out.print("Enter String : ");
        String str = kb.nextLine();
        System.out.println("Sum : " + sum(str));
    }

    public static int sum(String s) {
        String sNew = "";
        if (s.length() == 0) { return 0; }
        else {
            sNew = s.substring(1, s.length());
            if (Character.isDigit(s.charAt(0))) {
                return sum(sNew) + Character.digit(s.charAt(0), 10);
            } else {
                return sum(sNew) + 0;
            }
        }
    }
}
```

โจทย์ข้อที่ 12

```
public static String revs(String s) {
    if (s.length() > 0) {
        return s.charAt(s.length() - 1) + revs(s.substring(0, s.length() - 1));
    } else {
        return "";
    }
}
```

โจทย์ข้อที่ 13

```
public static String decToBin(int dec) {
    if (dec > 0) {
        return decToBin(dec / 2) + "" + (dec % 2);
    } else {
        return "";
    }
}
```

โจทย์ข้อที่ 14

```
public static boolean isPalindrome(String p) {
    if (p.length() > 1) {
        if (p.charAt(0) == p.charAt(p.length() - 1)) {
            return isPalindrome(p.substring(1, p.length() - 1));
        } else {
            return false;
        }
    } else {
        return true;
    }
}
```

## โจทย์ข้อที่ 15

```
import java.util.Scanner;
public class PrintBinary {
    public static void main(String[] args) {
        Scanner kb = new Scanner(System.in);
        System.out.print("printX(n) : ");
        int n = kb.nextInt();
        printX(n);
    }
    public static void printX(int n) {
        printX("0", 1, n); printX("1", 1, n);
    }
    public static void printX(String a, int length, int n) {
        if (length == n) {
            System.out.println(a); return;
        }
        printX(a + "0", length+1, n);
        printX(a + "1", length+1, n);
    }
}
```

## โจทย์ข้อที่ 16

```
public class CheckArray {
    public static void main(String arg[]) {
        int w[] = { 100, 393, 522, 786, 201, 640, 233, 961, 847 };
        int x[] = { 100, 393, 522, 786, 201, 640, 233, 961 };
        int y[] = { 100, 393, 522, 786, 201, 640, 233, 961 };
        int z[] = { 100, 393, 522, 786, 201, 640, 233, 960 };
        System.out.println(checkArray(w,x));
        System.out.println(checkArray(x,y));
        System.out.println(checkArray(x,z));
    }
    public static String checkArray(int a[], int b[]) {
        if (a.length != b.length) return "Arrays not equal";
        else if (a.length <= 0) return "Arrays equal";
        else if (a[a.length-1] != b[b.length-1]) return "Arrays not equal";
        else {
            int arrayA[] = new int[a.length-1];
            int arrayB[] = new int[b.length-1];
            for (int i = 0; i < a.length-1; i++) {
                arrayA[i] = a[i]; arrayB[i] = b[i];
            }
            return checkArray(arrayA, arrayB);
        }
    }
}
```

## โจทย์ข้อที่ 17

```
import java.util.Scanner;
public class FootballTeam {
    public static void main(String[] args) {
        Scanner kb = new Scanner(System.in);
        System.out.print("Enter n : ");
        int n = kb.nextInt();
        System.out.println(match(n));
    }
    public static int match(int n) {
        if (n == 1) { return 0; }
        else { return match(n-1) + (n-1) * 2; }
    }
}
```

## โจทย์ข้อที่ 18

```
import java.util.Scanner;
public class WordCount {
    public static void main(String[] args) {
        Scanner kb = new Scanner(System.in);
        System.out.print("Enter message : ");
        String s = kb.nextLine();
        System.out.println(wordCount(s));
    }
    public static int wordCount(String m) {
        m = m.trim();
        if (m.length() == 0) return 0;
        else {
            if (m.indexOf(" ") < 0) return 1;
            else {
                return wordCount(m.substring(m.indexOf(" ")+1, m.length())) + 1;
            }
        }
    }
}
```

**CHAPTER  
ANS-10**

**คลาสและอ็อบเจ็คต์**  
(Classes and Objects)

**โจทย์ข้อที่ 1**

ข้อ	ข้อมูลหรือเมทอด	คำตอบ
1.	Math.sqrt(x)	C
2.	p.colorCode(s)	D
3.	Array.equals(a, b)	C
4.	v.x	B
5.	System.getProperties()	C
6.	Integer.MAX_VALUE	A
7.	kb.nextInt()	D

ข้อ	ข้อมูลหรือเมทอด	คำตอบ
8.	rectangle.setSize(w, h)	D
9.	Math.PI	A
10.	a.appendArrays(x,y)	D
11.	std.grad	B
12.	Sqt.borders(a,b)	C
13.	in.readLine()	D
14.	i.id_code	B

**โจทย์ข้อที่ 2**

```

Hello C
Hello A
Hello F
See you again Java!

28 84 47 72
69 45
91 40 28
42 34 37
13 26 87 35

Sum 0 : 243
Sum 1 : 229
Sum 2 : 199
Sum 3 : 107
    
```

**โจทย์ข้อที่ 3**

```

flavorSet(0):
Chocolate
Mocha Almond Fudge
mint Chip
Rum Raisin
Strawberry
flavorSet(1):
Chocolate
Strawberry
Mocha Almond Fudge
Rum Raisin
mint Chip
    
```

**โจทย์ข้อที่ 4**

```

public class Account {
    public static double balance;
    public Account() { balance = 0.0; }
    public Account(double money) { balance = money; }
    public double getbalance() { return balance; }
    public static void deposit(double money) { balance += money; }
    public static double withdraw(double money) {
        if (balance >= money) {
            balance -= money;
            return money;
        } else {
            return 0.0;
        }
    }
} //End of method
} //End of Class
    
```

**โจทย์ข้อที่ 5**

```

import java.util.Scanner;
public class StudentPassword {
    public static long[] pass(int n) {
        long pwd[] = new long[n];
        int i = 0;
        while (i < n) {
            long x = (long)(Math.random() * 1000000);
            if ((x >= 100000) && check(x, i, pwd)) {
                pwd[i] = x;
                i++;
            }
        } //End of while
        return pwd;
    }
    public static boolean check(long x, int n, long p[]) {
        int i = 0;
        for (; i < n; i++) {
            if (p[i] == x) { break; }
        } //End of for i
        if (i == n) return true;
        else return false;
    }
    public static void display(long stid[], long stpwd[]) {
        for (int i = 0; i < stid.length; i++) {
            System.out.println(stid[i] + "\t" + stpwd[i]);
        }
    }
    public static void main(String[] args) {
        Scanner kb = new Scanner(System.in);
        System.out.print("Enter n : ");
        int n = kb.nextInt();
        long id[] = new long[n];
        for (int i = 0; i < n; i++) {
            System.out.print("Enter Student ID : ");
            id[i] = kb.nextLong();
        }
        long p[] = pass(n);
        display(id, p);
    }
}
    
```

**โจทย์ข้อที่ 6**

```

public class DigitGame {
    public int totalScore = 0;
    public String randomDigit(int n) {
        String sDigit = "";
        for (int i = 0; i < n; i++) {
            int x = (int)(Math.random() * 10);
            sDigit += x;
        }
        return sDigit;
    }
    public int guessDigitCheck(String sGuess, String sRandom) {
        if (sGuess.length() == 2) {
            if (sGuess.equals(sRandom)) return 7;
            else return 0;
        } else if (sGuess.length() == 3) {
            if (sGuess.equals(sRandom)) return 50;
            else {
                int digGuess[] = new int[10];
                int digRandom[] = new int[10];
            }
        }
    }
}
    
```

```

    for (int i = 0; i < 3; i++) {
        digGuess[Character.digit(sGuess.charAt(i),10)]++;
        digRandom[Character.digit(sRandom.charAt(i),10)]++;
    } //End of for i
    int c = 0;
    while (c < 10)
        if (digGuess[c] != digRandom[c]) break;
        else c++;
    if (c == 10) return 10;
    else return 0;
} //End of else
} else { return 0; }
}

public int checkScore(String g, String r, int s) {
    int score = guessDigitCheck(g, r) * s;
    totalScore = totalScore + score;
    return score;
}
}

```

```

import java.util.Scanner;
public class RunDigitGame {
    public static void main(String[] args) {
        Scanner kb = new Scanner(System.in);
        String name = "";
        String guess = "";
        int score = 0, i = 1;
        DigitGame dg = new DigitGame();
        while (true) {
            guess = "";
            System.out.println("==== Guess Digit Game " + (i++) + " =====");
            System.out.print("Enter name : ");
            name = kb.next();
            if (name.equals("End")) {
                System.out.println("Total score : " + dg.totalScore);
                break;
            }
            while (guess.length() < 2 || guess.length() > 3) {
                System.out.print("Enter guess digit : ");
                guess = kb.next();
            }
            System.out.print("Enter score : ");
            score = kb.nextInt();
            String ranDigit = dg.randomDigit(guess.length());
            int getScore = dg.checkScore(guess, ranDigit, score);
            System.out.println(name + "/" + guess + "/" + score + " : " +
                getScore + " (" + ranDigit + ")");
        } //End of while (true)
    }
}

```

โจทย์ข้อที่ 7

```

0,null
101,Samuk
103,Taksin
101,Samuk
Samuk Grade :U
Taksin Grade :U

```

โจทย์ข้อที่ 8

```

0,0
6
10
60
4
-1
Only A for me
Only F for me
5
5
7

35
63
2
I love Java

```

โจทย์ข้อที่ 9

```

import java.util.Scanner;
public class RunCarPark {
    public static void main(String[] args) {
        Scanner kb = new Scanner(System.in);
        CarPark c = new CarPark();
        while (true) {
            System.out.print("Enter Code (1-4) : ");
            int code = kb.nextInt();
            if (code == 1) {
                if (c.full()) System.out.println("NO ENTRY");
                else System.out.println("ENTRY");
            } else if (code == 2) {
                if (c.full() == false) {
                    int sp[] = c.getAddress();
                    System.out.println("Row:" + sp[0] + ", Column:" + sp[1]);
                    c.park(sp[0], sp[1]);
                } else {
                    System.out.println("Not ready for park");
                } //End of if c.full()
            } else if (code == 3) {
                System.out.print("Row: ");
                int row = kb.nextInt();
                System.out.print("Column: ");
                int col = kb.nextInt();
                c.collect(row, col);
            } else if (code == 4) {
                System.out.println("Exit program"); break;
            } else { }
        } //End of while (true)
    } //End of main()
}

```

```

public class CarPark {
    private boolean[][] space = new boolean[20][4];

    public int getSpaces() {
        int n = 0;
        for (int i = 0; i < space.length; i++) {
            for (int j = 0; j < space[i].length; j++)
                if (space[i][j] == false) n++;
        }
        return n;
    } //End of getSpace()

    public int[] getAddress() {
        int addr[] = new int[2];
        for (int i = 0; i < space.length; i++) {
            for (int j = 0; j < space[i].length; j++) {
                if (space[i][j] == false) {
                    addr[0] = i; addr[1] = j;
                    return addr;
                } //End of if
            } //End of for j
        } //End of for i
        addr[0] = -1; addr[1] = -1;
        return addr;
    } //End of getAddress()

    public boolean full() {
        CarPark c = new CarPark();
        if (c.getSpaces() > 0) return false;
        else return true;
    } //End of full()

    public void park(int r, int c) {
        if (space[r][c] == true) {
            System.out.println("Not ready for park");
        } else {
            space[r][c] = true;
            System.out.println("Car park ready");
        }
    } //End of park()

    public void collect(int r, int c) {
        if (space[r][c] == false) {
            System.out.println("Car park not valid position");
        } else {
            space[r][c] = false;
            System.out.println("Car leave");
        }
    } //End of collect()
}

```

## CHAPTER ANS-11

## การประกอบและการสืบทอด (Composition and Inheritance)

### โจทย์ข้อที่ 1

```

1
5
0
1
10
10
5

```

### โจทย์ข้อที่ 2

```

public class InterestBearingAccount extends Account {
    public final double default_interest = 7.95;
    public double interest_rate;

    public InterestBearingAccount() {
        super();
        interest_rate = default_interest;
    } //End of constructor

    public InterestBearingAccount(double money) {
        super(money);
        interest_rate = default_interest;
    } //End of constructor

    public InterestBearingAccount(double money, double interest) {
        super(money);
        interest_rate = interest;
    } //End of constructor

    public void deposit(double money) {
        if (money > 0.0) super.deposit(money);
        else System.out.println("Invalid Money");
    } //End of deposit method

    public double withdraw(double money) {
        if (money > 0.0) {
            return super.withdraw(money);
        } else {
            System.out.println("InvalidMoney");
            return 0.0;
        }
    } //End of withdraw method

    public void addMonthlyInterest() {
        super.balance = super.balance + (super.balance*interest_rate/100)/12;
    }

    public double getInterestRate() {
        return interest_rate;
    }
} //End of class

```

```
public class AccountDemo {
    public static void main(String[] args) {
        InterestBearingAccount acc1 = new InterestBearingAccount();
        InterestBearingAccount acc2 = new InterestBearingAccount(5000);
        acc1.deposit(4500);
        acc2.deposit(1000);
        System.out.println(acc1.withdraw(6100));
        System.out.println(acc2.withdraw(2500));
        acc1.addMonthlyInterest();
        acc2.addMonthlyInterest();
        for (int i = 1; i < 11; i++) {
            acc1.addMonthlyInterest();
            acc2.addMonthlyInterest();
        }
        System.out.println(acc1.getbalance());
        System.out.println(acc2.getbalance());
        InterestBearingAccount acc3;
        acc3 = new InterestBearingAccount(acc1.getbalance(), 9.45);
        acc3.addMonthlyInterest();
        System.out.println(acc3.getbalance() + "\t" +
            acc3.getInterestRate());
    }
}
```

โจทย์ข้อที่ 3 ยังไม่ได้ทำเฉลยในข้อนี้

โจทย์ข้อที่ 4

ผลลัพธ์ Part 1

```
<<B>>
<<A>>
<<B>>
1
2
<<A>>
1
<<C>>
4
<<A>>
<<B>>
<<C>>
9
```

ผลลัพธ์ Part 2

```
<<B>>
0
<<A>>
0
<<A>>
1
<<C>>
5
c = 2
```

โจทย์ข้อที่ 5

```
public class Point3D extends Point{
    int z;
    public Point3D(int x, int y, int z) { super(x,y); this.z = z; }
    public String toString() { return "(" + x + "," + y + "," + z + ")"; }
    public boolean equals(Point3D p){
        if( p.x == this.x && p.y == this.y && p.z == this.z ) return true;
        else return false;
    }
    double distanceTo(Point3D p){
        int dX = Math.abs(this.x - p.x);
        int dY = Math.abs(this.y - p.y);
        int dZ = Math.abs(this.z - p.z);
        return Math.sqrt(Math.pow(dX,2)+Math.pow(dY,2)+Math.pow(dZ,2));
    }
}
```

โจทย์ข้อที่ 6

```
public class Rectangle {
    Point pLT; // point for Left and Top
    Point pRD; // point for Right and Down
    public Rectangle(Point pLT, Point pRD) {
        // Check Rectangle
        if(pLT.x == pRD.x || pLT.y == pRD.y) {
            System.out.println("Not A Rectangle");
        } else {
            this.pLT = pLT; this.pRD = pRD;
        }
    }
    double area() {
        return Math.abs(pLT.x-pRD.x)*Math.abs(pLT.y-pRD.y);
    }
    public boolean equals(Object obj) {
        Rectangle rec = (Rectangle) obj;
        if(Math.abs(this.pLT.x-this.pRD.x) ==
            Math.abs(rec.pLT.x-rec.pRD.x) &&
            Math.abs(this.pLT.y-this.pRD.y) ==
            Math.abs(rec.pLT.y-rec.pRD.y))
            return true;
        else return false;
    }
    boolean contrains(Point p) {
        int iL, iR, iT, iD;

        if(pLT.x > pRD.x) { iR = pLT.x; iL = pRD.x; }
        else { iR = pRD.x; iL = pLT.x; }

        if(pLT.y > pRD.y) { iT = pLT.y; iD = pRD.y; }
        else { iT = pRD.y; iD = pLT.y; }

        if((p.x >= iL) && (p.x <= iR) && (p.y >= iD) && (p.y <= iT))
            return true;
        else return false;
    }
}
```

โจทย์ข้อที่ 7

```
public class SuperArea extends SuperShape {
    double w, h, b;
    SuperArea() { this.w = 0.0; this.h = 0.0; this.b = 0.0; }
    double getAreal(double w) {
        this.w = w;
        super.name = "Rectangle";
        return w * w;
    }
    double getArea2(double h, double b) {
        this.h = h; this.b = b;
        super.name = "Triangle";
        return 0.5 * h * b;
    }
}
```

```

import java.util.Scanner;
public class RunSuperArea {
    public static void main(String[] args) {
        Scanner kb = new Scanner(System.in);
        SuperArea sa = new SuperArea();
        while (true) {
            System.out.print("Enter Type : ");
            String type = kb.next();
            type = type.toUpperCase();
            if (type.charAt(0) == 'C') {
                System.out.print("Enter Radius : ");
                double radius = kb.nextDouble();
                double area = sa.getCircle(radius);
                System.out.println("Type : " + sa.getName());
                System.out.println("Radius : " + radius);
                System.out.println("Area : " + area);
            } else if (type.charAt(0) == 'W') {
                System.out.print("Enter Wide : ");
                double wide = kb.nextDouble();
                double area = sa.getAreal(wide);
                System.out.println("Type : " + sa.getName());
                System.out.println("Wide : " + wide);
                System.out.println("Area : " + area);
            } else if (type.charAt(0) == 'T') {
                System.out.print("Enter High : ");
                double high = kb.nextDouble();
                System.out.print("Enter Base : ");
                double base = kb.nextDouble();
                double area = sa.getArea2(high, base);
                System.out.println("Type : " + sa.getName());
                System.out.println("High : " + high);
                System.out.println("Base : " + base);
                System.out.println("Area : " + area);
            } else if (type.charAt(0) == 'E') {
                break;
            } else { }
        } //End of while
    }
}

```

## CHAPTER ANS-12

## การอ่านแฟ้มข้อมูล (Reading Data File)

### โจทย์ข้อที่ 1

```

import java.util.Scanner;
import java.io.*;
public class Test {
    public static void main(String[] args) throws IOException {
        Scanner sc = new Scanner(new File("D:/score.txt"));
        while (true) {
            if (!sc.hasNext()) break;
            System.out.print(sc.nextLong() + "\t");
            double s = sc.nextDouble();
            if (s > 60.0) System.out.println("S");
            else System.out.println("U");
        } //End of while
    } //End of method
}

```

### โจทย์ข้อที่ 2

```

import java.util.Scanner;
import java.io.*;
public class TestNumber {
    public static void main(String[] args) throws IOException {
        Scanner sc = new Scanner(new File("D:/number.txt"));
        int col[] = new int[4];
        while (true) {
            if (!sc.hasNext()) break;
            String s = sc.nextLine();
            int sum = 0, n = 0, len = s.length();
            String stNum = "", tempS = "";
            for (int i = 0; i < len; i++) {
                if (s.indexOf(".") > 0) {
                    stNum = s.substring(0, s.indexOf("."));
                    tempS += stNum + "\t";
                    s = s.substring(s.indexOf(".") + 1);
                    n = Integer.parseInt(stNum);
                    sum += n;
                    col[i] = col[i] + n;
                } else {
                    tempS += s + "\t";
                    n = Integer.parseInt(s);
                    sum += n;
                    col[i] = col[i] + n;
                    break;
                }
            } //End of for
            System.out.println(tempS + " = " + sum);
        } //End of while
        int colSum = col[0] + col[1] + col[2] + col[3];
        System.out.println("=====");
        System.out.println(col[0] + "\t" + col[1] + "\t" + col[2] + "\t"
            + col[3] + "\t" + colSum);
    } //End of method
}

```

โจทย์ข้อที่ 3

```
import java.util.Scanner;
import jlab.WordScanner;
import java.io.*;
public class CountLove {
    public static void main(String[] args) throws IOException {
        Scanner sc = new Scanner(new File("D:/song.txt"));
        WordScanner wsc = new WordScanner(new File("D:/song.txt"));
        int w1 = 0, w2 = 0;
        String str = "";
        while (true) {
            if (!wsc.hasNext()) break;
            String s = wsc.nextWord().toLowerCase();
            if (s.equals("love")) w1++;
        }
        while (true) {
            if (!sc.hasNext()) break;
            String s = sc.nextLine();
            String sNew = "";
            for (int i = 0; i < s.length(); i++)
                if (s.charAt(i) != ' ') { sNew += s.charAt(i); }
            sNew = sNew.toLowerCase();
            while (sNew.length() > 0) {
                if (sNew.indexOf("love") >= 0) {
                    w2++; sNew = sNew.substring(sNew.indexOf("love") + 4);
                } else { break; }
            } //End of while
        } //End of while true
        System.out.println("Count Word 1 : " + w1);
        System.out.println("Count Word 2 : " + w2);
    }
}
```

โจทย์ข้อที่ 4

```
import java.util.Scanner;
import java.io.*;
public class TestText {
    public static void main(String[] args) throws IOException {
        Scanner sc = new Scanner(new File("D:/data.txt"));
        int sum = 0, c = 0;
        String str = "";
        while (true) {
            if (!sc.hasNext()) break;
            String s = sc.nextLine();
            for (int i = 0; i < s.length(); i++) {
                if (Character.isDigit(s.charAt(i))) {
                    sum += Character.digit(s.charAt(i), 10); c++;
                } else {
                    str += s.charAt(i);
                } //End of if
            } //End of for
        } //End of while
        System.out.println("Sum : " + sum);
        System.out.println("Avg : " + ((double) sum / (double) c));
        System.out.println("Len : " + str.length());
    }
}
```

โจทย์ข้อที่ 5

```
import java.util.Scanner;
import java.io.*;
public class Test {
    public static void main(String[] args) throws IOException {
        Scanner sc1 = new Scanner(new File("D:/data1.txt"));
        Scanner sc2 = new Scanner(new File("D:/data2.txt"));
        int f1 = 0, f2 = 0;
        int c = 1;
        while (true) {
            if (!sc1.hasNext()) break;
            String s = sc1.nextLine();
            if (c <= 2) { c++; continue; }
            s = s.substring(s.indexOf(".") + 1).trim();
            s = s.substring(10).trim();
            if (s.equals("F")) { f1++; }
        } //End of while
        c = 1;
        while (true) {
            if (!sc2.hasNext()) break;
            String s = sc2.nextLine();
            if (c <= 2) { c++; continue; }
            s = s.substring(s.indexOf(".") + 1).trim();
            s = s.substring(10).trim();
            if (s.equals("F")) { f2++; }
        } //End of while
        System.out.println("F Semester 1/2550 : " + f1);
        System.out.println("F Semester 1/2551 : " + f2);
        if (f1 > f2) {
            System.out.println("Number of F Semester 1/2550 more than
                Number of F Semester 1/2551");
        } else if (f1 == f2) {
            System.out.println("Number of F Semester 1/2550 equal
                Number of F Semester 1/2551");
        } else {
            System.out.println("Number of F Semester 1/2550 less than
                Number of F Semester 1/2551");
        }
    } //End of method
}
```