Digits allowed before decimal for float and double-

```java
float tt = 340282350000000000000000000000000000000f;//39
//309
double ddd = 17976931348623157000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
```

String is non primitive data type.

String is class.

maths5.java × string1.java ×

```java
package com.day3;

public class string1 {
//
//  String is non primitive data type.
//  String is class. default class.

    public static void main(String[] args) {

        String name="karan";
        String num="2434";

        String name1="karan";
        String num1="-243erer.4234";

        String x="hello";
        String y="Selenium";

//      String a1=100; //Type mismatch: cannot convert from int to String
//      String b1=-32.34; //Type mismatch: cannot convert from double to String

        int a=100;
        double b=-3434.324;

        System.out.println(a+b); //-3334.324
        System.out.println(x+y); //helloSelenium
        System.out.println(name1+num1); //karan-243erer.4234
        System.out.println(name+num); //karan2434

        System.out.println(a+b+x); //-3334.324hello
        System.out.println(a+b+x+y); //-3334.324helloSelenium
        System.out.println(x+y+a+b); //helloSelenium100-3434.324
        System.out.println(a+b+x+y+a+b); //-3334.324helloSelenium100-3434.324
        System.out.println(x+y+(a+b)); //helloSelenium-3334.324
    }

}
```

2

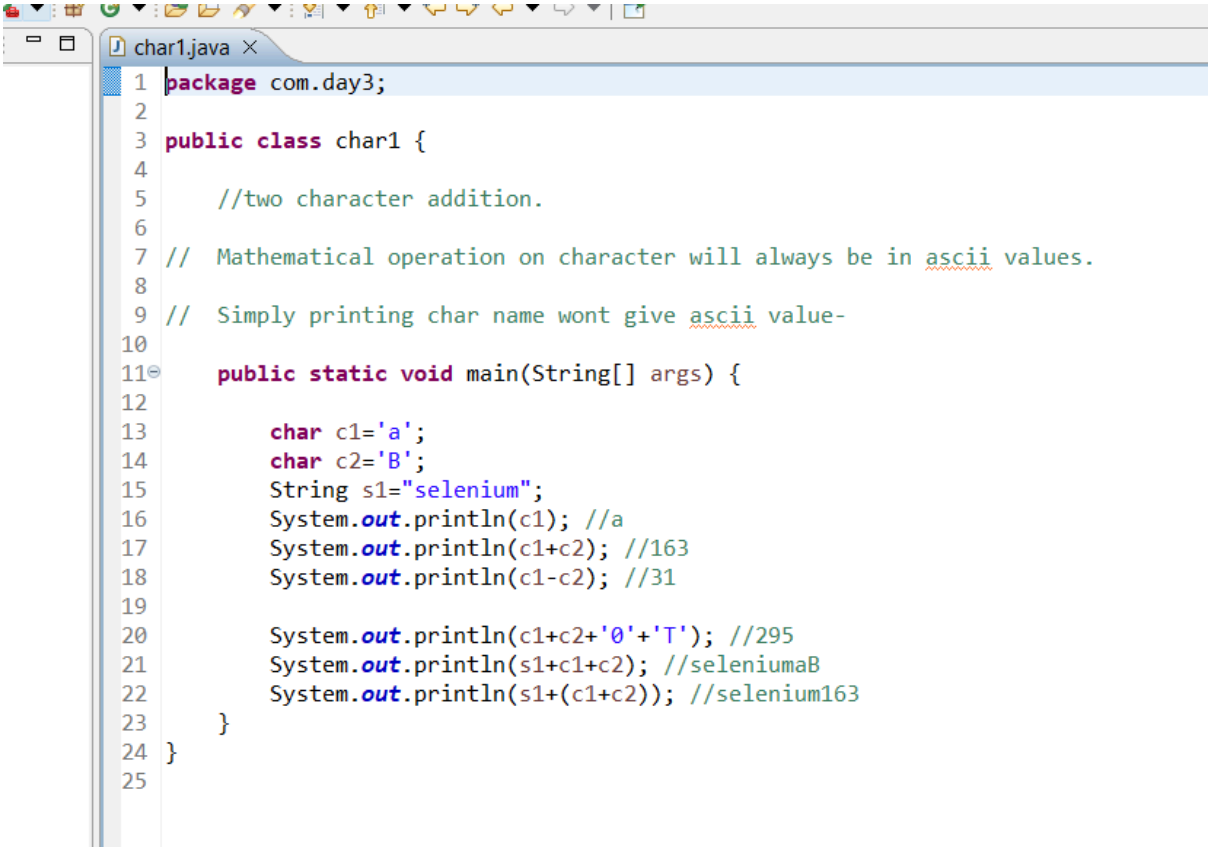
string2.java

```java
package com.day3;

public class string2 {

public static void main(String[] args) {

        String name="karan";
        String num="2434";

        String name1="karan";
        String num1="-243erer.4234";

        String x="hello";
        String y="Selenium";

//      String a1=100; //Type mismatch: cannot convert from int to String
//      String b1=-32.34; //Type mismatch: cannot convert from double to String

        int a=100;
        int b=-3434;

        double c=32434.23434;
        double d=-32434.2343434;

        System.out.println(a+b+x+y+a+b+c+d); //-3334helloSelenium100-343432434.23434-32434.2343434
        System.out.println(a+b+x+y+(a+b+c+d)); //-3334helloSelenium-3334.0000034000004
        System.out.println(a+b+c+d+x+y); //-3334.0000034000004helloSelenium

        System.out.println("the value of a is " + a); //the value of a is 100
        System.out.println("the value of b is "  + b); //the value of b is -3434
        System.out.println("the sum of a and b is " + a+b); //the sum of a and b is 100-3434
        System.out.println("the sum of a and b is " + (a+b)); //the sum of a and b is -3334
        System.out.println("the sum of a and b is " + c+d ); //the sum of a and b is 32434.23434-32434.2343434
        System.out.println("the sum of a and b is " + (c+d)); //the sum of a and b is -3.4000004234258085E-6

}
}
```

string3.java

```java
package com.day3;

public class string3 {

    //String can be concatenated with any data type-

    public static void main(String[] args) {

        char c1='a';
        String s1="tiger";

        System.out.println(c1+s1); //atiger
    }

}
```

Check with double also-


char1.java

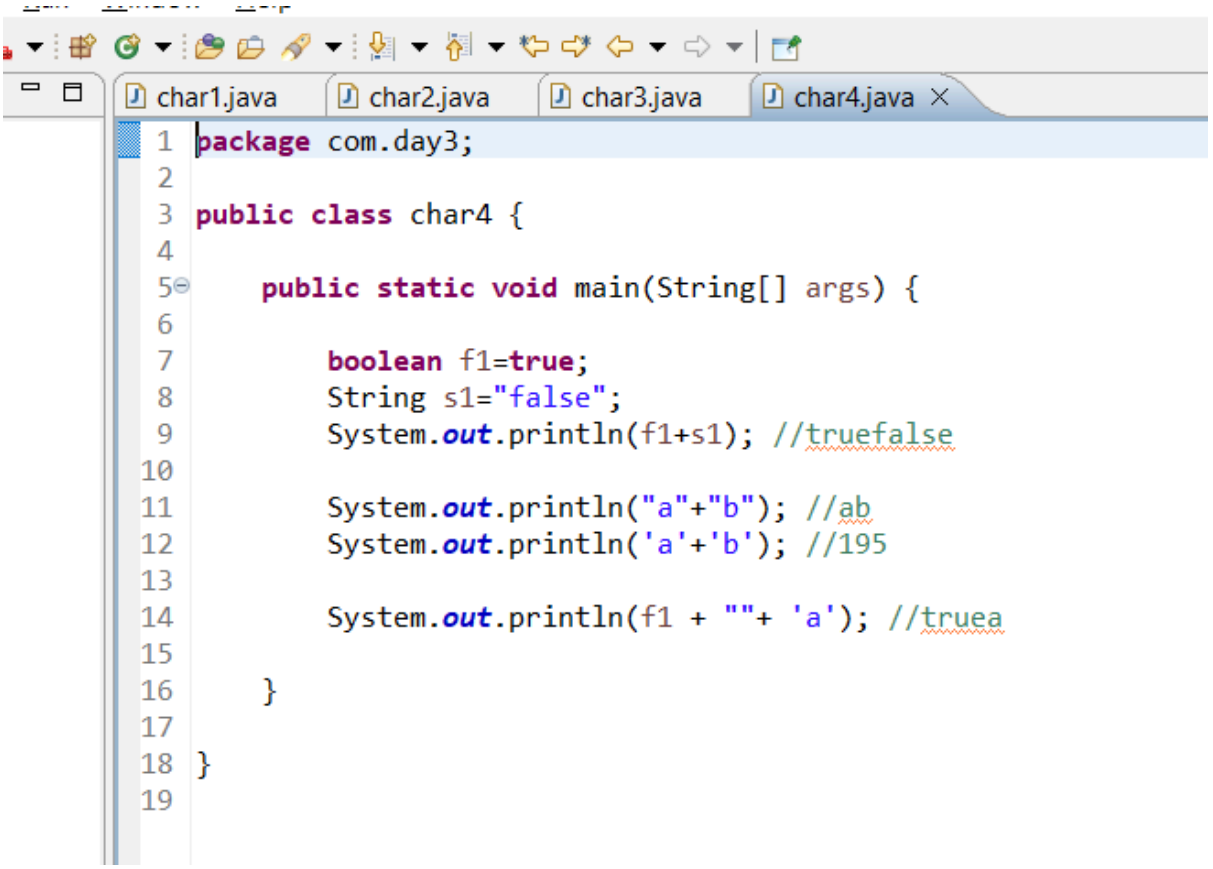
```java
package com.day3;

public class char1 {

    //two character addition.

//  Mathematical operation on character will always be in ascii values.

//  Simply printing char name wont give ascii value-

    public static void main(String[] args) {

        char c1='a';
        char c2='B';
        String s1="selenium";
        System.out.println(c1); //a
        System.out.println(c1+c2); //163
        System.out.println(c1-c2); //31

        System.out.println(c1+c2+'0'+'T'); //295
        System.out.println(s1+c1+c2); //seleniumaB
        System.out.println(s1+(c1+c2)); //selenium163
    }
}

```

char1.java | char2.java

```java
package com.day3;

public class char2 {

    public static void main(String[] args) {

        //to get ascii of any character type cast it using any data type.
//      We can type cast using any numeric data type like int, long etc.

        char c1='a';

        System.out.println(c1); //a
        System.out.println((int)c1); //97
        System.out.println((byte)c1); //97
        System.out.println((short)c1); //97
        System.out.println((long)c1); //97
        System.out.println((float)c1); //97.0
        System.out.println((double)c1); //97.0

        System.out.println((byte)'$'); //36
    }

}
```

char1.java | char2.java | char3.java

```java
package com.day3;

public class char3 {

    public static void main(String[] args) {

        //another way to get ascii.
//      Add zero to char and get it.

        System.out.println('a'+0); //97
        System.out.println('a'+10); //107

        System.out.println('a'+10+-234.2344+324324.234324); //324196.999924

        System.out.println("naveen" + 'm'); //naveenm

        System.out.println('a'+'c'+'0'+'9'+'A'+"hello"+'a'+'b'); //366helloab

    }

}
```



Mathematical operation on character will always be in ascii values.

Simply printing char name wont give ascii value-

range of ascii for character-

```
//range:
//a-z: 97 to 122
//A-Z: 65 to 90
//0-9: 48 to 57
```

To get ascii value of any char-

Type cast.

We can type cast using any numeric data type like int, long etc.

Another way to get ascii-

Add zero to char and get it.

Int /int will give int quotient.

Int /float or float/float or float/int will give float quotient.

int number divided by zero gives arithmetic exception.

Float divided by zero gives infinity-

Get remainder-

By default all decimals are double.

We have to type cast to get the data type we need –

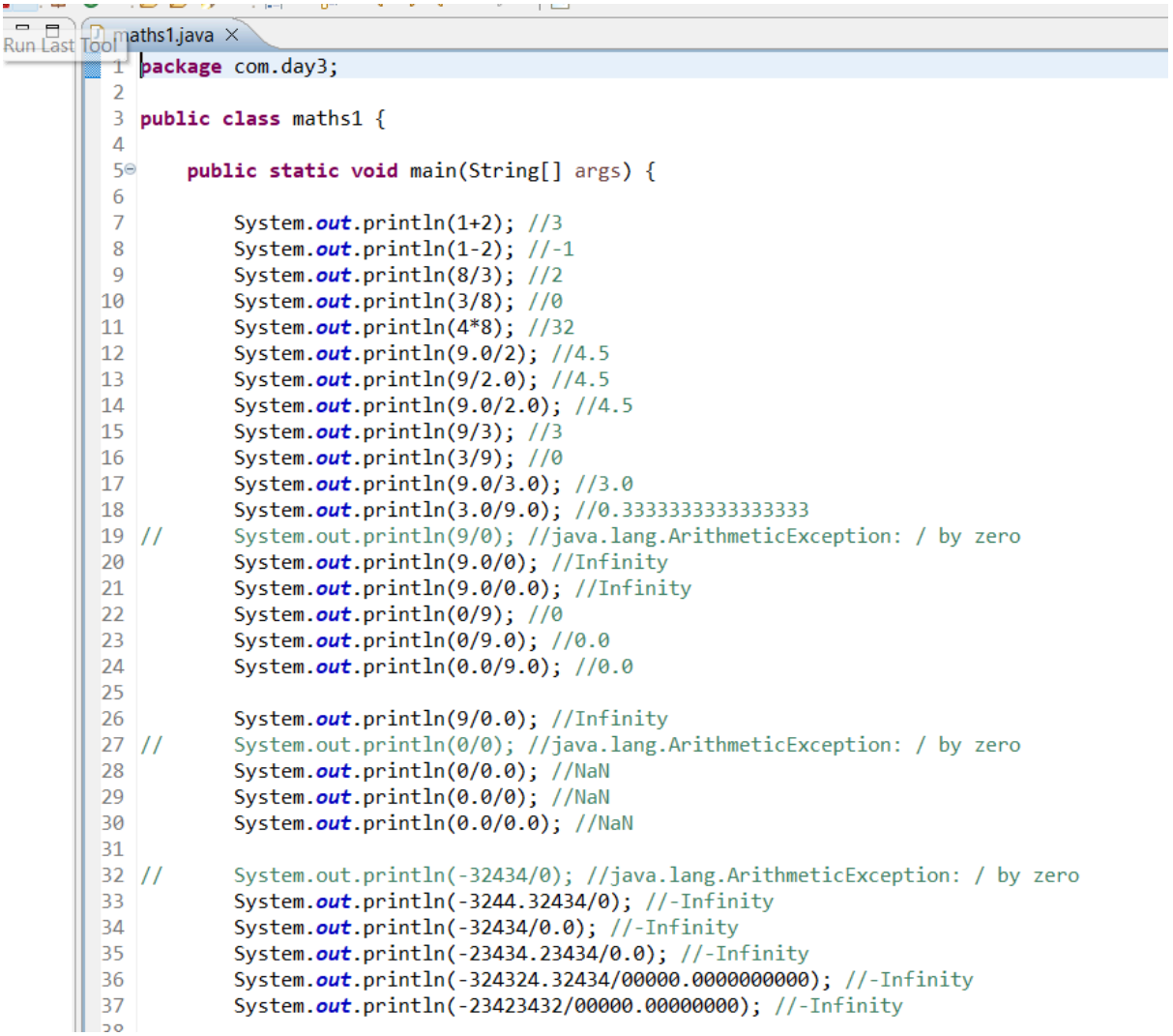
```
System.out.println(100);//4 bytes
System.out.println((byte)100);//1 byte

System.out.println(12.33);//8 bytes
System.out.println(12.33f);//4 bytes
```

Double or float numbers gives surprises-

Don’t be bothered, research done and proved.

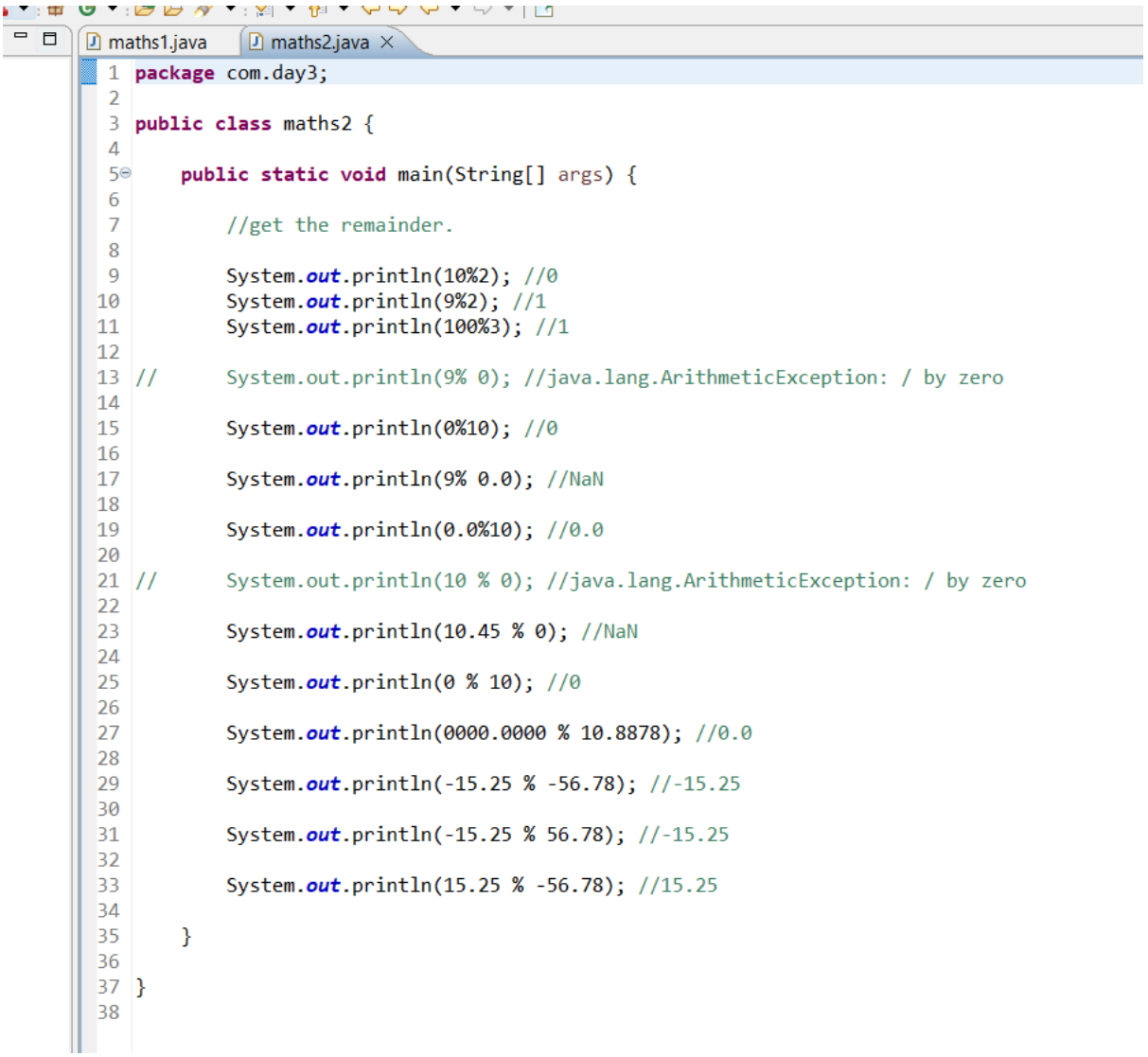
Convert to actual float by appending f-

One float one double-



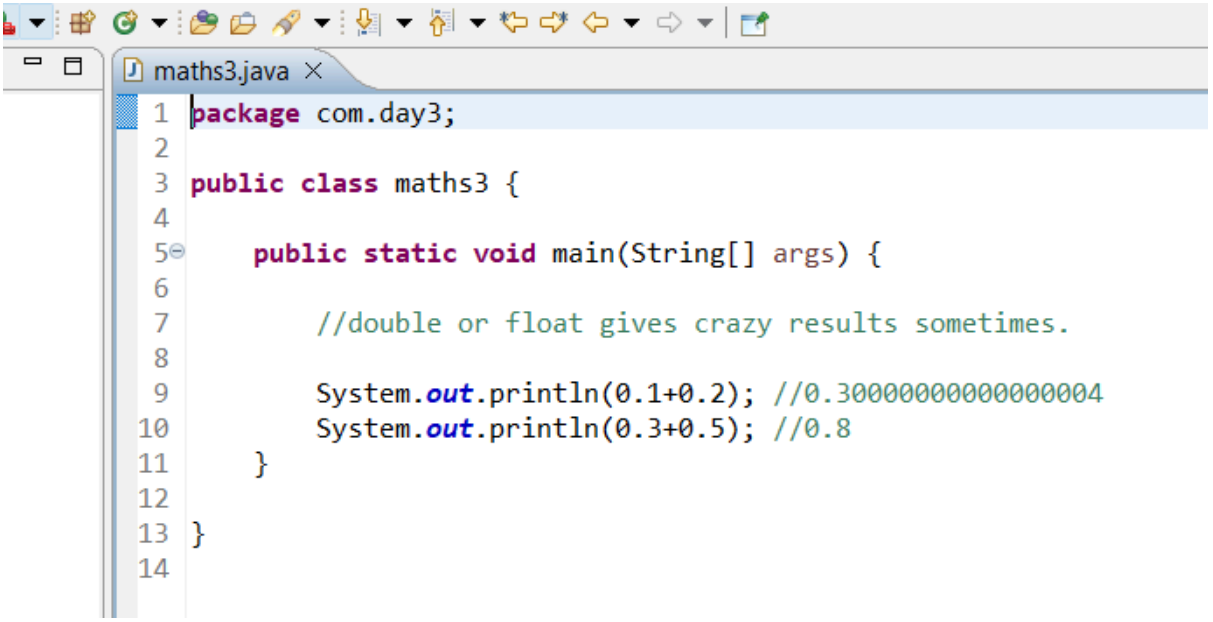

```java
package com.day3;

public class maths1 {

    public static void main(String[] args) {

        System.out.println(1+2); //3
        System.out.println(1-2); //-1
        System.out.println(8/3); //2
        System.out.println(3/8); //0
        System.out.println(4*8); //32
        System.out.println(9.0/2); //4.5
        System.out.println(9/2.0); //4.5
        System.out.println(9.0/2.0); //4.5
        System.out.println(9/3); //3
        System.out.println(3/9); //0
        System.out.println(9.0/3.0); //3.0
        System.out.println(3.0/9.0); //0.3333333333333333
//      System.out.println(9/0); //java.lang.ArithmeticException: / by zero
        System.out.println(9.0/0); //Infinity
        System.out.println(9.0/0.0); //Infinity
        System.out.println(0/9); //0
        System.out.println(0/9.0); //0.0
        System.out.println(0.0/9.0); //0.0

        System.out.println(9/0.0); //Infinity
//      System.out.println(0/0); //java.lang.ArithmeticException: / by zero
        System.out.println(0/0.0); //NaN
        System.out.println(0.0/0); //NaN
        System.out.println(0.0/0.0); //NaN

//      System.out.println(-32434/0); //java.lang.ArithmeticException: / by zero
        System.out.println(-3244.32434/0); //-Infinity
        System.out.println(-32434/0.0); //-Infinity
        System.out.println(-23434.23434/0.0); //-Infinity
        System.out.println(-324324.32434/00000.0000000000); //-Infinity
        System.out.println(-23423432/00000.00000000); //-Infinity
```

```
        System.out.println(-23434.23434/0.0); //-Infinity
        System.out.println(-324324.32434/00000.0000000000); //-Infinity
        System.out.println(-23423432/00000.00000000); //-Infinity

        System.out.println(-9/3); //-3
        System.out.println(-9/-3); //3
        System.out.println(9/-3); //-3

        System.out.println(-9.8/2.3); //-4.260869565217392
        System.out.println(-9.8/-2.3); //4.260869565217392
        System.out.println(9.8/-2.3); //-4.260869565217392


        System.out.println(-0/32434); //0
        System.out.println(-0/3244.32434); //0.0
        System.out.println(-0.0/32434); //-0.0
        System.out.println(-0.0/23434.23434); //-0.0
        System.out.println(-00000.0000000000/324324.32434); //-0.0
        System.out.println(-00000.00000000/23423432); //-0.0



    }

}
```



maths1.java | maths2.java

```java
package com.day3;

public class maths2 {

    public static void main(String[] args) {

        //get the remainder.

        System.out.println(10%2); //0
        System.out.println(9%2); //1
        System.out.println(100%3); //1

//      System.out.println(9% 0); //java.lang.ArithmeticException: / by zero

        System.out.println(0%10); //0

        System.out.println(9% 0.0); //NaN

        System.out.println(0.0%10); //0.0

//      System.out.println(10 % 0); //java.lang.ArithmeticException: / by zero

        System.out.println(10.45 % 0); //NaN

        System.out.println(0 % 10); //0

        System.out.println(0000.0000 % 10.8878); //0.0

        System.out.println(-15.25 % -56.78); //-15.25

        System.out.println(-15.25 % 56.78); //-15.25

        System.out.println(15.25 % -56.78); //15.25

    }

}
```


maths3.java
1 package com.day3;
2
3 public class maths3 {
4
5 public static void main(String[] args) {
6
7 //double or float gives crazy results sometimes.
8
9 System.out.println(0.1+0.2); //0.30000000000000004
10 System.out.println(0.3+0.5); //0.8
11 }
12
13 }
14

maths3.java | maths4.java

```java
package com.day3;

public class maths4 {

    public static void main(String[] args) {

//      Convert to actual float by appending f-

        System.out.println(0.1 + 0.2f); //0.3000000029802322

        System.out.println(0.1f+0.2); //0.30000000149011613

        System.out.println(0.1f+0.2f); //0.3

        System.out.println(0.2+0.5); //0.7


//      System.out.println((9/0)+1); //java.lang.ArithmeticException: / by zero
//      System.out.println((9/0)+21); //java.lang.ArithmeticException: / by zero
        System.out.println((9.0/0)+1); //Infinity
        System.out.println((9.0/0)+21); //Infinity


        System.out.println((0/9)+1); //1
        System.out.println((0/9)+21); //21
        System.out.println((0/9.0)+1); //1.0
        System.out.println((0/9.0)+21); //21.0


        System.out.println((9/0.0)+1); //Infinity
        System.out.println((9/00.00)+21); //Infinity
        System.out.println((9.0/00.00)+1); //Infinity
        System.out.println((9.0/0.0)+21); //Infinity


        System.out.println((00.00/9)+1); //1.0
        System.out.println((0.0/9)+21); //21.0
        System.out.println((0.0/9.0)+1); //1.0
        System.out.println((00.000/9.0)+21); //21.0

        System.out.println((9.0/0.0)+1); //Infinity
        System.out.println((9.2/00.000)+21); //Infinity
        System.out.println((9.0/00.000)+1); //Infinity
        System.out.println((9.0/0.0)+21); //Infinity


    }

}
```

maths3.java | maths4.java | maths5.java

```java
package com.day3;

public class maths5 {

    public static void main(String[] args) {

//      System.out.println((9/0)+'1'); //java.lang.ArithmeticException: / by zero
//      System.out.println((9/0)+"21"); //java.lang.ArithmeticException: / by zero
//      System.out.println((9/0)+"2"); //java.lang.ArithmeticException: / by zero

        System.out.println((9.0/0)+'1');  //Infinity
        System.out.println((9.0/0)+"21");  //Infinity21
        System.out.println((9.0/0)+"1");  //Infinity1


        System.out.println((0/9)+'1');  //49
        System.out.println((0/9)+"21"); //021
        System.out.println((0/9)+"1"); //01
        System.out.println((0/9.0)+'1'); //49.0
        System.out.println((0/9.0)+"21"); //0.021
        System.out.println((0/9.0)+"1"); //0.01


        System.out.println((9/0.0)+'1');  //Infinity
        System.out.println((9/00.00)+"21"); //Infinity21
        System.out.println((9/00.00)+"1"); //Infinity1
        System.out.println((9.0/00.00)+'1'); //Infinity
        System.out.println((9.0/0.0)+"21"); //Infinity21
        System.out.println((9/00.00)+"1"); //Infinity1


        System.out.println((00.00/9)+'1'); //49.0
        System.out.println((0.0/9)+"21"); //0.021
        System.out.println((0.0/9)+"1"); //0.01

        System.out.println((0.0/9.0)+'1');  //49.0
        System.out.println((00.000/9.0)+"21");  //0.021
        System.out.println((0.0/9)+"1"); //0.01

        System.out.println((00.000/9.0)+"21");  //0.021
        System.out.println((0.0/9)+"1"); //0.01

        System.out.println((9.0/0.0)+'1');  //Infinity
        System.out.println((9.2/00.000)+"21");  //Infinity21
        System.out.println((9.2/00.000)+"1"); //Infinity1

        System.out.println((9.0/00.000)+'1'); //Infinity
        System.out.println((9.0/0.0)+"21");  //Infinity21
        System.out.println((9.2/00.000)+"1"); //Infinity1


    }

}
```