Digits allowed before decimal for float and double-

String is non primitive data type. String is class.

```
🛽 maths5.java 🗴 🛽 string1.java 🗴
  1 package com.day3;
  3
    public class string1 {
        String is non primitive data type.
        String is class. default class.
        public static void main(String[] args) {
            String name="karan";
 10
            String num="2434";
 12
            String name1="karan";
 13
 14
            String num1="-243erer.4234";
 15
 16
            String x="hello";
 17
            String y="Selenium";
 18
 19 //
            String a1=100; //Type mismatch: cannot convert from int to String
 20 //
            String b1=-32.34; //Type mismatch: cannot convert from double to String
 21
 22
            int a=100;
 23
            double b=-3434.324;
 24
            System.out.println(a+b); //-3334.324
 25
 26
            System.out.println(x+y); //helloSelenium
            System.out.println(name1+num1); //karan-243erer.4234
            System.out.println(name+num); //karan2434
 28
 29
 30
            System.out.println(a+b+x); //-3334.324hello
 31
            System.out.println(a+b+x+y); //-3334.324helloSelenium
            System.out.println(x+y+a+b); //helloSelenium100-3434.324
 32
 33
            System.out.println(a+b+x+y+a+b); //-3334.324helloSelenium100-3434.324
            System.out.println(x+y+(a+b)); //helloSelenium-3334.324
 34
 35
 36
37 }
38
```

```
string2.java ×
               package com.day3;
                   public class string2 {
               5@ public static void main(String[] args) {
           % 7 % 8
                                String name="karan";
String num="2434";
                                String name1="karan";
String num1="-243erer.4234";
            %11
             13
                                 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
             16 //
             18
             19
                                 int a=100;
                                 int b=-3434;
             20
             21
             22
                                 double c=32434.23434;
             23
24
                                 double d=-32434.2343434;
                                 System.out.println(a+b+x+y+a+b+c+d); //-3334helloSelenium100-343432434.23434-32434.2343434
             26
                                 System.out.println(a+b+x+y+(a+b+c+d)); //-3334helloSelenium-3334.0000034000004
             27
                                 System.out.println(a+b+c+d+x+y); //-3334.0000034000004helloSelenium
             28
                                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 32434.23434-32434.234343
System.out.println("the sum of a and b is " + (c+d)); //the sum of a and b is -3.4000004234258085E-6
             29
              30
             31
             32
              34
             35
36 }
             37 }
             38
```

```
string3.java ×
        package com.day3;
      1
      2
      3
        public class string3 {
      4
      5
             //String can be concatenated with any data type-
      6
             public static void main(String[] args) {
      7⊝
      8
      9
                 char c1='a';
                 String s1="tiger";
     10
     11
                 System.out.println(c1+s1); //atiger
     12
     13
             }
     14
     15
     16
```

Check with double also-

```
⑤ ▼: ₩ ७ ▼: ▷ ▷ ◊ ▼: ½ ▼ № ▼ └ ∨ ∨ ∨ ▼ □
 □ □ □ char1.java ×
         package com.day3;
         2
         3
           public class char1 {
         5
               //two character addition.
           // Mathematical operation on character will always be in ascii values.
         8
         9
           // Simply printing char name wont give ascii value-
        10
        11⊖
                public static void main(String[] args) {
        12
                   char c1='a';
        13
        14
                   char c2='B';
                   String s1="selenium";
        15
        16
                   System.out.println(c1); //a
        17
                   System.out.println(c1+c2); //163
                   System.out.println(c1-c2); //31
        18
        19
        20
                   System.out.println(c1+c2+'0'+'T'); //295
        21
                   System.out.println(s1+c1+c2); //seleniumaB
        22
                   System.out.println(s1+(c1+c2)); //selenium163
        23
               }
        24
           }
        25
```

```
□ □ char1.java □ char2.java ×
      1 package com.day3;
        3 public class char2 {
        4
        5⊜
              public static void main(String[] args) {
        6
        7
                  //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.
        8
        9
       10
                  char c1='a';
       11
       12
                  System.out.println(c1); //a
       13
                  System.out.println((int)c1); //97
       14
                  System.out.println((byte)c1); //97
       15
                  System.out.println((short)c1); //97
       16
                  System.out.println((long)c1); //97
       17
                  System.out.println((float)c1); //97.0
       18
                  System.out.println((double)c1); //97.0
       19
       20
                  System.out.println((byte)'$'); //36
       21
       22
       23 }
       24
```

```
□ □ char1.java □ char2.java
                            🚺 char3.java 🗡
      1 package com.day3;
        3 public class char3 {
        4
        5⊚
              public static void main(String[] args) {
        6
        7
                  //another way to get ascii.
        8
                  Add zero to char and get it.
        9
                  System.out.println('a'+0); //97
       10
       11
                  System.out.println('a'+10); //107
       12
       13
                  System.out.println('a'+10+-234.2344+324324.234324); //324196.999924
       14
       15
                  System.out.println("naveen" + 'm'); //naveenm
       16
                  System.out.println('a'+'c'+'0'+'9'+'A'+"hello"+'a'+'b'); //366helloab
       17
       18
       19
              }
       20
       21 }
       22
```

```
, ▼ | 👚 🎯 ▼ | 🤔 🖒 🔗 ▼ | 🕍 ▼ 🚰 ▼ 🏷 💸 🗘 ▼ 🔿 ▼ | 📑
      ☑ char1.java
☑ char2.java
☑ char3.java
                                              🚺 char4.java 🗡
        1 package com.day3;
         2
           public class char4 {
               public static void main(String[] args) {
                   boolean f1=true;
                   String s1="false";
                   System.out.println(f1+s1); //truefalse
        10
                   System.out.println("a"+"b"); //ab
       11
                   System.out.println('a'+'b'); //195
                   System.out.println(f1 + ""+ 'a'); //truea
       16
        17
        18 }
```

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-

```
Run Last Toomaths1.java ×
       package com.day3;
         3
           public class maths1 {
        4
         5⊜
               public static void main(String[] args) {
         6
         7
                   System.out.println(1+2); //3
         8
                   System.out.println(1-2); //-1
                   System.out.println(8/3); //2
        9
        10
                   System.out.println(3/8); //0
        11
                   System.out.println(4*8); //32
        12
                   System.out.println(9.0/2); //4.5
                   System.out.println(9/2.0); //4.5
        13
        14
                   System.out.println(9.0/2.0); //4.5
        15
                   System.out.println(9/3); //3
        16
                   System.out.println(3/9); //0
        17
                   System.out.println(9.0/3.0); //3.0
        18
                   19 //
                   System.out.println(9/0); //java.lang.ArithmeticException: / by zero
        20
                   System.out.println(9.0/0); //Infinity
        21
                   System.out.println(9.0/0.0); //Infinity
        22
                   System.out.println(0/9); //0
        23
                   System. out. println(0/9.0); //0.0
        24
                   System.out.println(0.0/9.0); //0.0
        25
        26
                   System.out.println(9/0.0); //Infinity
                   System.out.println(0/0); \ // java.lang. Arithmetic Exception: \ / \ by \ zero
        27 //
        28
                   System.out.println(0/0.0); //NaN
        29
                   System.out.println(0.0/0); //NaN
        30
                   System.out.println(0.0/0.0); //NaN
        31
                   System.out.println(-32434/0); //java.lang.ArithmeticException: / by zero
        32 //
        33
                   System.out.println(-3244.32434/0); //-Infinity
                   System.out.println(-32434/0.0); //-Infinity
        34
                   System.out.println(-23434.23434/0.0); //-Infinity
        35
        36
                   System.out.println(-324324.32434/00000.0000000000); //-Infinity
        37
                   System.out.println(-23423432/00000.00000000); //-Infinity
        20
```

```
3y3ccm.vuc.pr incin(-23434.23434/0.0), //-incintcy
36
           System.out.println(-324324.32434/00000.0000000000); //-Infinity
37
           System.out.println(-23423432/00000.00000000); //-Infinity
38
39
           System.out.println(-9/3); //-3
           System.out.println(-9/-3); //3
40
41
           System.out.println(9/-3); //-3
42
43
           System.out.println(-9.8/2.3); //-4.260869565217392
44
           System.out.println(-9.8/-2.3); //4.260869565217392
45
           System.out.println(9.8/-2.3); //-4.260869565217392
46
47
48
           System.out.println(-0/32434); //0
49
           System.out.println(-0/3244.32434); //0.0
50
           System.out.println(-0.0/32434); //-0.0
51
           System.out.println(-0.0/23434.23434); //-0.0
52
           System.out.println(-00000.000000000/324324.32434); //-0.0
           System.out.println(-00000.00000000/23423432); //-0.0
53
54
55
56
57
       }
58
59 }
60
```

```
maths1.java maths2.java ×
        1 package com.day3;
        3 public class maths2 {
        4
        5⊜
              public static void main(String[] args) {
        6
        7
                  //get the remainder.
        8
        9
                  System.out.println(10%2); //0
       10
                  System.out.println(9%2); //1
       11
                  System.out.println(100%3); //1
       12
       13 //
                  System.out.println(9% 0); //java.lang.ArithmeticException: / by zero
       14
                  System.out.println(0%10); //0
       15
       16
       17
                  System.out.println(9% 0.0); //NaN
       18
       19
                  System.out.println(0.0%10); //0.0
       20
                  System.out.println(10 % 0); //java.lang.ArithmeticException: / by zero
       21 //
       22
       23
                  System.out.println(10.45 % 0); //NaN
       24
                  System.out.println(0 % 10); //0
       25
       26
                  System.out.println(0000.0000 % 10.8878); //0.0
       27
       28
       29
                  System.out.println(-15.25 % -56.78); //-15.25
       30
       31
                  System.out.println(-15.25 % 56.78); //-15.25
       32
       33
                  System.out.println(15.25 % -56.78); //15.25
       34
       35
              }
       36
       37 }
       38
```

```
- -
     🚺 maths3.java 🗡
       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
                System.out.println(0.1+0.2); //0.300000000000000004
       9
       10
                System.out.println(0.3+0.5); //0.8
       11
       12
      13 }
       14
```

```
<u>4</u> ▼: ♥ ♥ ▼: ♥ ₽ // ▼: ½ ▼ 1/ ▼ ♥ ▼ ♥ ♥ ♥ | <u>**</u>
 □ □ □ maths3.java □ maths4.java ×
         1 package com.day3;
         3 public class maths4 {
        4
        5⊜
               public static void main(String[] args) {
        6
        7 //
                  Convert to actual float by appending f-
        8
        9
                  System.out.println(0.1 + 0.2f); //0.3000000029802322
        10
        11
                  System.out.println(0.1f+0.2); //0.30000000149011613
        12
                  System.out.println(0.1f+0.2f); //0.3
        13
        14
        15
                  System.out.println(0.2+0.5); //0.7
        16
        17
                  System.out.println((9/0)+1); \ //java.lang. Arithmetic Exception: \ / \ by \ zero
        18 //
        19 //
                  System.out.println((9/0)+21); //java.lang.ArithmeticException: / by zero
        20
                  System.out.println((9.0/0)+1); //Infinity
        21
                  System.out.println((9.0/0)+21); //Infinity
        22
        23
        24
                  System.out.println((0/9)+1); //1
        25
                  System.out.println((0/9)+21); //21
        26
                  System.out.println((0/9.0)+1); //1.0
                  System.out.println((0/9.0)+21); //21.0
        27
        28
        29
                  System.out.println((9/0.0)+1); //Infinity
        30
                  System.out.println((9/00.00)+21); //Infinity
        31
                  System. \textit{out}.println((9.0/00.00)+1); \ //Infinity
        32
        33
                  System.out.println((9.0/0.0)+21); //Infinity
        34
        35
        36
                  System.out.println((00.00/9)+1); //1.0
        37
                  System.out.println((0.0/9)+21); //21.0
        38
                  System.out.println((0.0/9.0)+1); //1.0
        39
                  System.out.println((00.000/9.0)+21); //21.0
        40
                  System aut println//0 0/0 0\11\. //Infinity
                   System.out.println((00.000/9.0)+21); //21.0
    39
    40
    41
                   System.out.println((9.0/0.0)+1); //Infinity
                   System. out. println((9.2/00.000)+21); //Infinity
    42
    43
                   System.out.println((9.0/00.000)+1); //Infinity
    44
                   System.out.println((9.0/0.0)+21); //Infinity
    45
    46
    47
    48
    49
    50
```

```
maths3.java maths4.java
                                🔃 maths5.java 🗴
        1 package com.day3;
        3
          public class maths5 {
        4
        5⊜
              public static void main(String[] args) {
        6
        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)+"2"); //java.lang.ArithmeticException: / by zero
        8 //
        9 //
       10
       11
                  System.out.println((9.0/0)+'1'); //Infinity
                  System.out.println((9.0/0)+"21"); //Infinity21
       12
       13
                  System.out.println((9.0/0)+"1"); //Infinity1
       14
       15
                  System.out.println((0/9)+'1'); //49
       16
       17
                  System.out.println((0/9)+"21"); //021
                  System.out.println((0/9)+"1"); //01
       18
                  System.out.println((0/9.0)+'1'); //49.0
       20
                  System.out.println((0/9.0)+"21"); //0.021
       21
                  System.out.println((0/9.0)+"1"); //0.01
       22
       23
                  System.out.println((9/0.0)+'1'); //Infinity
       24
       25
                  System.out.println((9/00.00)+"21"); //Infinity21
       26
                  System.out.println((9/00.00)+"1"); //Infinity1
                  System.out.println((9.0/00.00)+'1'); //Infinity
       27
       28
                  System.out.println((9.0/0.0)+"21"); //Infinity21
       29
                  System.out.println((9/00.00)+"1"); //Infinity1
       30
       31
                  System.out.println((00.00/9)+'1'); //49.0
       32
                  System.out.println((0.0/9)+"21"); //0.021
       33
       34
                  System.out.println((0.0/9)+"1"); //0.01
       35
       36
                  System.out.println((0.0/9.0)+'1'); //49.0
                  System.out.println((00.000/9.0)+"21"); //0.021
       37
       38
                  System.out.println((0.0/9)+"1"); //0.01
       39
                  -,-----,
   37
                  System.out.println((00.000/9.0)+"21"); //0.021
                  System.out.println((0.0/9)+"1"); //0.01
   38
   39
                  System.out.println((9.0/0.0)+'1'); //Infinity
   40
   41
                  System.out.println((9.2/00.000)+"21"); //Infinity21
                  System.out.println((9.2/00.000)+"1"); //Infinity1
   42
   43
                  System.out.println((9.0/00.000)+'1'); //Infinity
   44
   45
                  System.out.println((9.0/0.0)+"21"); //Infinity21
                  System.out.println((9.2/00.000)+"1"); //Infinity1
   46
   47
   48
   49
             }
   50
   51
       }
   52
```