


CORE JAVA

TYPES

VARIABLES AND CONSTANTS

PRIMITIVE AND REFERENCE TYPES



Type	Bytes	Range
byte	1	[-128, 127]
short	2	[-32K, 32K]
int	4	[-2B, 2B]
long	8	
float	4	
double	8	
char	2	A, B, C, ...
boolean	1	true / false

PRIMITIVE FOR STORING SIMPLE VALUES AND REFERENCE FOR STPRING COMPLEX OBJECTS

EG

```
package com.codewithmosh;

public class Main {

    public static void main(String[] args) {
        byte age = 30;
        int viewsCount = 123_456_789;
    }
}
```

```
byte age = 30;
long viewsCount = 3_123_456_789;
```

Integer number too large

```
public static void main(String[] args) {
    byte age = 30;
    long viewsCount = 3_123_456_789L;
}
```

```
public static void main(String[] args) {
    byte age = 30;
    long viewsCount = 3_123_456_789L;
    double price = 10.99;
}
```

```
public static void main(String[] args) {
    byte age = 30;
    long viewsCount = 3_123_456_789L;
    float price = 10.99;
}
```

Incompatible types.
Required: **float**
Found: **double**

```
public static void main(String[] args) {  
    byte age = 30;  
    long viewsCount = 3_123_456_789L;  
    float price = 10.99F;  
}
```

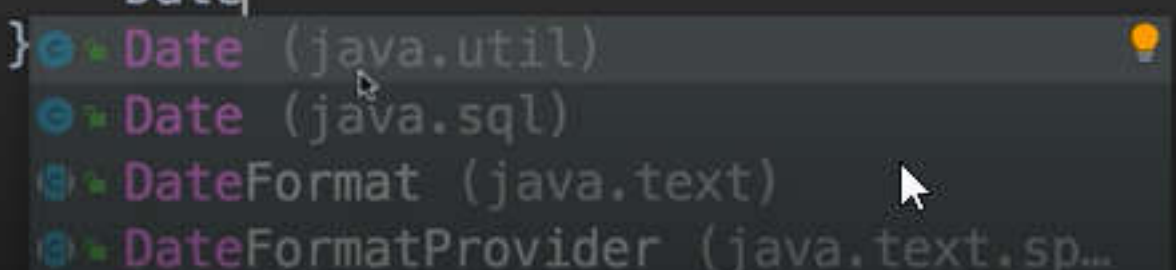
```
public static void main(String[] args) {  
    byte age = 30;  
    long viewsCount = 3_123_456_789L;  
    float price = 10.99F;  
    char letter = 'A';  
}
```

SINGLE CHARACTER WITH SINGLE QOTES AND MUIPLE CHARACTER WITH DOUBLE QUOTES

```
public static void main(String[] args) {  
    byte age = 30;  
    long viewsCount = 3_123_456_789L;  
    float price = 10.99F;  
    char letter = 'A';  
    boolean isEligible = false;  
}
```

EXAMPLE FOR REFERENCE TYPE:

```
public static void main(String[] args) {  
    byte age = 30;  
    Date  
}
```



ENTER

```

package com.codewithmosh;

import java.util.Date;

public class Main {

    public static void main(String[] args) {
        byte age = 30;
        Date
    }
}

```

AUTOMATICALLY ADDS JAVA.UTIL. DATE IMPORT

REFERENCE TYPE ALLOCATON NEEDS MEMORY

PRIMITIVE TYPE DONT NEED MEMORRY

```

public static void main(String[] args) {
    byte age = 30;
    Date now = new Date();
}

```

THIS IS INSTANCE FOR DATE CLASS

AN OBJECT IS AN INSTENT OF CLASS

```

public static void main(String[] args) {
    byte age = 30;
    Date now = new Date();
    now.
}
    after(Date when)    boolean
    before(Date when)   boolean

```

```

public static void main(String[] args) {
    byte age = 30;
    Date now = new Date();
    System.out
}
    out (= null)    Print
    setOut(PrintStream out)

```



```

    public static void main(String[] args) {
        byte age = 30;
        Date now = new Date();
        System.out.println();
    }
}

```

PRESS SOUT +TAB

```

    public static void main(String[] args) {
        byte age = 30;
        Date now = new Date();
        sout
    }
    sout Prints a string to System.o...
    soutm Prints current class and m...

```

OUTPUT

```

    byte age = 30;
    Date now = new Date();
    System.out.println("now");
}
}
Main : main()
Main x
/Library/Java/JavaVirtualMachines/jd
now

```

REMOVE THE QUOTES

```

    public static void main(String[] args) {
        byte age = 30;
        Date now = new Date();
        System.out.println(now);
    }
}

```

OUTPUT:

```
byte age = 30;  
Date now = new Date();
```

Main > main()

/Library/Java/JavaVirtualMachines/jdk-12.
Tue May 21 13:09:55 PDT 2019

Process finished with exit code 0

DIFFERENCE IN MEMORY:

```
public static void main(String[] args) {  
    byte x = 1;  
    byte y = x;  
    x = 2;  
    System.out.println(y);  
}
```

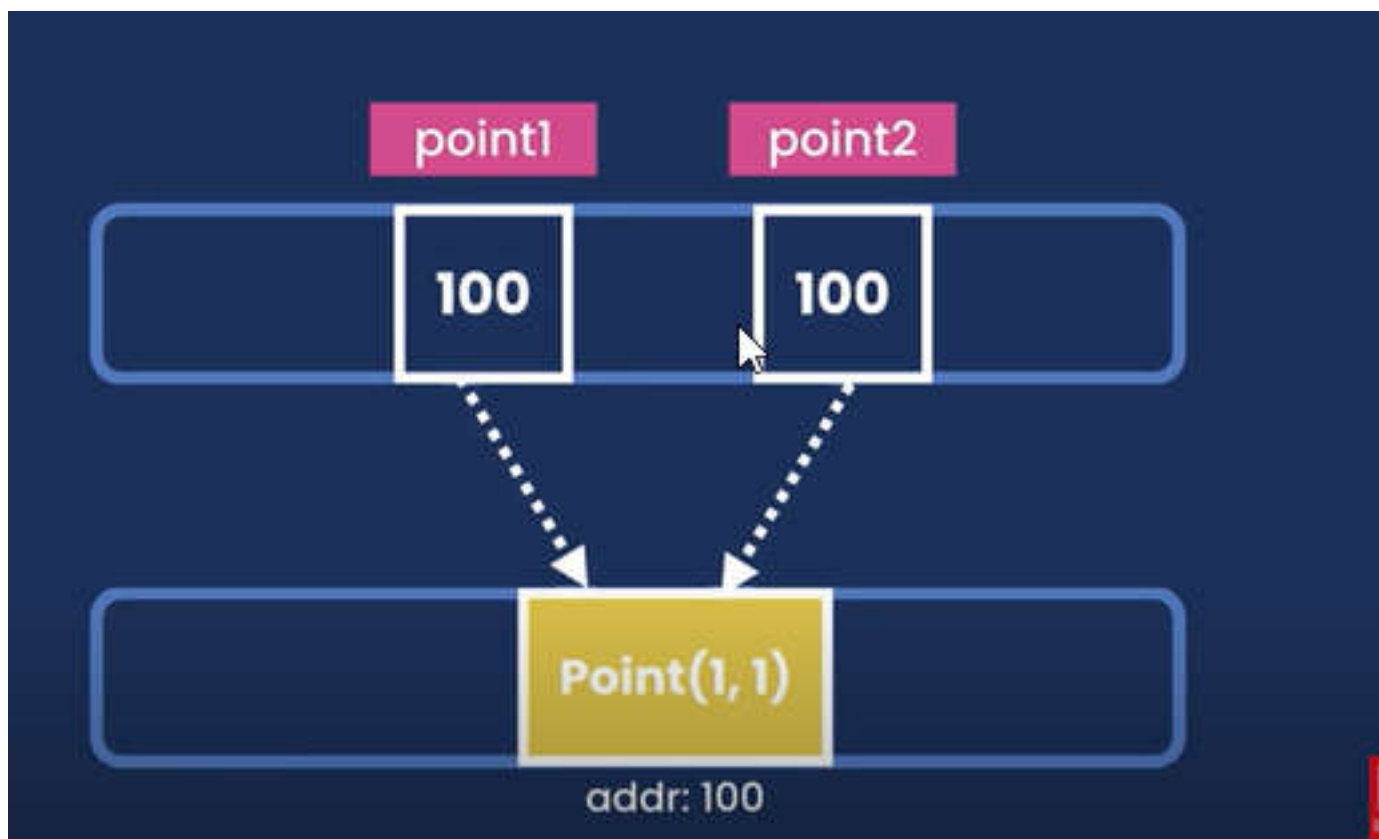
IN THIS THE VALUE OF X IS NOT RELATED TO VALUE OF Y. BOTH VARIABLES ARE INDEPENDENT

POINT CLASS

```
public static void main(String[] args) {  
    Point  
} Point (java.awt)  
Point2D (java.awt.geom)
```

```
1 package com.codewithmosh;
2
3 import java.awt.*;
4
5 public class Main {
6
7     public static void main(String[] args) {
8         Point point1 = new Point(x:1, y:1);
9         Point point2 = point1;
10    }
11 }
12
```

POINT CONTAINS VALUES 1 AND 1 THAT IS POINT(1,1) STORED IN MEMORY ADDRESS ASSUME ITS 100
WHILE POINT2 = POINT1 IN THIS CASE POINT2 CONTAINS THE ADDRESS OF POINT1 IT DOESN'T STORE THE VALUES OF POINT
THIS IS THE MAIN DIFFERENCE BETWEEN PRIMITIVE AND REFERENCE TYPE



TEST:

```
public static void main(String[] args) {  
    Point point1 = new Point( x:1, y:1);  
    Point point2 = point1;  
    point1.x = 2;  
    System.out.println(point2);  
}
```

OUTPUT:

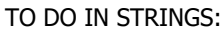
```
Point point2 = point1,  
point1.x = 2;  
System.out.println(point2);  
}  
}  
Main | main()  
Run: Main x  
/Library/Java/JavaVirtualMachines/jdk-12.0.1.j  
java.awt.Point[x=2,y=1]  
Process finished with exit code 0
```

CASTING

NUMBERS, STRINGS AND ARRAYS

STRING

STRING



SINCE STRING IS A CLASS WE CAN ACCESS THE OBJECTS USING . OPERATOR

```
public static void main(String[] args) {
    String message = "Hello World";
    message.endsWith("!!");
    System.out.println(message);
}
```

```
public static void main(String[] args) {  
    String message = "Hello World" + "!!!";  
  
    System.out.println(message.endsWith("!!!"));  
}  
}
```

OUTPUT

```
System.out.println(message.endsWith("!!!"));  
}  
}  
Main ▸ main()  
Main x  
/Library/Java/JavaVirtualMachines/jdk-12.0.1  
true  
Process finished with exit code 0
```

```
System.out.println(message.startsWith("!!!"));  
}  
}  
Main ▸ main()  
Main x  
/Library/Java/JavaVirtualMachines/jdk-12.0.1  
false  
Process finished with exit code 0
```

```
String message = "Hello world" + "!!!";
```

```
System.out.println(message.length());
```

```
}
```

Main · main()

Main ×

```
/Library/Java/JavaVirtualMachines/jdk-12.0.1.jdk
13
```

```
String message = "Hello world" + "!!!";
```

```
System.out.println(message.indexOf("H"));
```

```
}
```

Main · main()

Main ×

```
/Library/Java/JavaVirtualMachines/jdk-12.0.1.jdk
0
Process finished with exit code 0
```

```
String message = "Hello world" + "!!!";
```

```
System.out.println(message.indexOf("sky"));
```

```
}
```

Main · main()

Main ×

```
/Library/Java/JavaVirtualMachines/jdk-12.0.1.jdk
-1
```



```
void main(String[] args) {  
    message = "Hello World" + "!!";  
    System.out.println(message.replace(target: "!", replacement: "*"))  
}
```

```
System.out.println(message.replace(target: "!", replacement: "*"))
```

Main · main()

Run: Main ×

/Library/Java/JavaVirtualMachines/jdk-12.0.1.
Hello World**

Process finished with exit code 0

```
Main.java ×  
System.out.println(message.replace(target: "!", replacement: "*"))  
System.out.println(message);  
}  
}
```

Main · main()

Run: Main ×

/Library/Java/JavaVirtualMachines/jdk-12.0.1.
Hello World**
Hello World!!

STRINGS ARE IMMUTABLE

```

public static void main(String[] args) {
    String message = "Hello World" + "!!!";

    System.out.println(message.toLowerCase());
    System.out.println(message);
}

```

Main x

```

/Library/Java/JavaVirtualMach
hello world!!
Hello World!!

```

```

String message = "Hello World" + "!!!";

System.out.println(message.toUpperCase());
System.out.println(message);
}

```

```

public static void main(String[] args) {
    String message = "Hello World" + "!!!";

    System.out.println(message.trim());
    System.out.println(message);
}

```

WHITE SPACE IN END AND START

TO REMOVE

```
▶ public static void main(String[] args) {  
    String message = " Hello World" + "!! "  
    System.out.println(message.trim());  
Main ▶ main()  
Main x  
/Library/Java/JavaVirtualMachines/jdk-12.0.1  
Hello World!!  
Hello World!!  
Process finished with exit code 0
```

```
2  
3 ▶ public class Main {  
4  
5 ▶     public static void main(String[] args) {  
6         String message = "Hello \"Mosh\"";  
7         System.out.println(message);  
8     }  
9 }  
0
```

```
un: Main x  
/Library/Java/JavaVirtualMachines/jd  
Hello "Mosh"  
Process finished with exit code 0
```

```
public class Main {  
  
    public static void main(String[] args) {  
        // c:\Windows\...  
        String message = "c:\\Windows\\...|";  
        System.out.println(message);  
    }  
}
```

```
Main x  
/Library/Java/JavaVirtualMachines/  
c:\Windows\...  
Process finished with exit code 0
```

```
public class Main {  
  
    public static void main(String[] args) {  
        // c:\Windows\...  
        String message = "c:\nWindows\\...";  
        System.out.println(message);  
    }  
}
```

```
un: Main x  
/Library/Java/JavaVirtu  
c:  
Windows\...
```



```
public static void main(String[] args) {  
    // c:\Windows\...  
    String message = "c:\\tWindows\\...";  
    System.out.println(message);  
}
```

Main x

```
/Library/Java/JavaVirtualMac  
c: Windows\...  
  
Process finished with exit c
```

ARRAY

```
package com.example;  
  
public class Main {  
    public static void main(String[] args) {  
        int[] numbers = new int[5];  
    }  
}
```

```
public class Main {  
    public static void main(String[] args) {  
        int[] numbers = new int[5];  
        numbers[0] = 1;  
        numbers[1] = 2;  
        numbers[10] = 3; |  
    }  
}
```

Run: Main x

/Library/Java/JavaVirtualMachines/jdk-12.0.1
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: 10
at com.codewithmosh.Main.main(Main.java:10)

Main.java x

```
public static void main(String[] args) {  
    int[] numbers = new int[5];  
    numbers[0] = 1;  
    numbers[1] = 2;  
    System.out.println(numbers);  
}
```

```
Main + main()
Main x
/Library/Java/JavaVirtualMachines/jdk-12
[I@38af3868
Process finished with exit code 0
```

```
int[] numbers = new int[5];
numbers[0] = 1;
numbers[1] = 2;
Arrays|
```

Arrays (java.util)
ArrayStoreException (java.lang)
NegativeArraySizeException (java.l...

Press ↵ to choose the selected (or first) suggestion and insert a dot afterwards: 2 π

```
int[] numbers = new int[5];
numbers[0] = 1;
numbers[1] = 2;
Arrays.toString|
System|
```

toString(float[] a)
toString(int[] a)
toString(byte[] a)
toString(char[] a)
toString(long[] a)
toString(short[] a)
toString(double[] a)

```
public static void main(String[] args) {  
    int[] numbers = new int[5];  
    numbers[0] = 1;  
    numbers[1] = 2;  
  
    System.out.println(Arrays.toString(numbers))  
}
```

```
System.out.println(Arrays.toString(numbers))
```

Main · main()

/Library/Java/JavaVirtualMachines/jdk-8.0.602.jdk/Contents/Home/bin/java
[1, 2, 0, 0, 0]

Process finished with exit code 0

ZERO BY DEFAULT

```
/Library/Java/JavaVirtualMachines/jdk-8.0.602.jdk/Contents/Home/bin/java  
[1, 2, 0, 0, 0]
```

```
public static void main(String[] args) {  
    int[] numbers = { 2, 3, 5, 1, 4 };  
  
    System.out.println(Arrays.toString(numbers));  
}
```



```
public static void main(String[] args)
    int[] numbers = { 2, 3, 5, 1, 4 };
    numbers.
```

System.out.println(numbers.length);

- length
- clone()
- equals(Object obj)
- hashCode()

```
public class Main {

    public static void main(String[] args) {
        int[] numbers = { 2, 3, 5, 1, 4 };
        System.out.println(numbers.length);

        System.out.println(Arrays.toString(numbers));
    }
}
```

Main main()

Main x

/Library/Java/JavaVirtualMachine

5

[2, 3, 5, 1, 4]

Process finished with exit code

```
public static void main(String[] args) {  
    int[] numbers = { 2, 3, 5, 1, 4 };  
    Arrays.sort
```

Syst

```
    sort(int[] a)  
    sort(byte[] a)  
    sort(char[] a)  
    sort(long[] a)  
    sort(float[] a)  
    sort(short[] a)  
    sort(double[] a)
```

```
public class Main {  
  
    public static void main(String[] args) {  
        int[] numbers = { 2, 3, 5, 1, 4 };  
        Arrays.sort(numbers);  
        System.out.println(Arrays.toString(numbers));  
    }  
}
```

```
/Library/Java/JavaVirtualMachines/j  
[1, 2, 3, 4, 5]
```

```
Process finished with exit code 0
```

2D ARRAY

```

public class Main {

    public static void main(String[] args) {
        int[][] numbers = new int[2][3];
        numbers[0][0] = 1;
        System.out.println(Arrays.toString(numbers));
    }
}

```

un: Main x

```

/Library/Java/JavaVirtualMachines/jdk-
[[I@38af3868, [I@77459877]

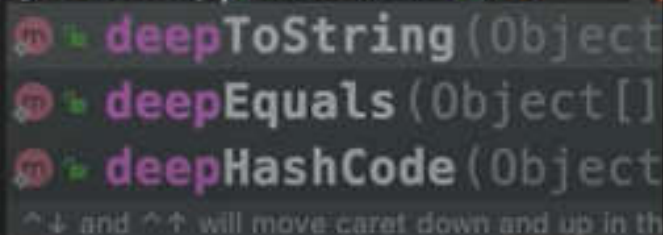
```

Process finished with exit code 0

```

public static void main(String[] args) {
    int[][] numbers = new int[2][3];
    numbers[0][0] = 1;
    System.out.println(Arrays.deepToString(numbers));
}

```



 deepToString (Object

 deepEquals (Object[]

 deepHashCode (Object

 ^↓ and ^↑ will move caret down and up in th

```

public class Main {

    public static void main(String[] args) {
        int[][] numbers = new int[2][3];
        numbers[0][0] = 1;
        System.out.println(Arrays.deepToString(numbers));
    }
}

```

@Nullable Object[] a

```
Main x
/Library/Java/JavaVirtualMachines/jdk
[[1, 0, 0], [0, 0, 0]]

Process finished with exit code 0
```

```
public class Main {

    public static void main(String[] args) {
        int[][] numbers = { { 1, 2, 3}, { 4, 5, 6 } }
        numbers[0][0] = 1;
        System.out.println(Arrays.deepToString(numbers))
    }
}
```

```
public static void main(String[] args) {
    int[][] numbers = { { 1, 2, 3}, { 4, 5, 6 } }
    System.out.println(Arrays.deepToString(numbers))
}

Main ▸ main()

Main x
/Library/Java/JavaVirtualMachines/jdk-12.0.
[[1, 2, 3], [4, 5, 6]]

Process finished with exit code 0
```

3D ARRAY


```
public class Main {
```

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

```
        int[][][] numbers = new int[2][3][5];
```

```
        numbers[0][0] = 1;
```

```
        System.out.println(Arrays.deepToString(num
```

```
    }
```

```
}
```

READ INPUT