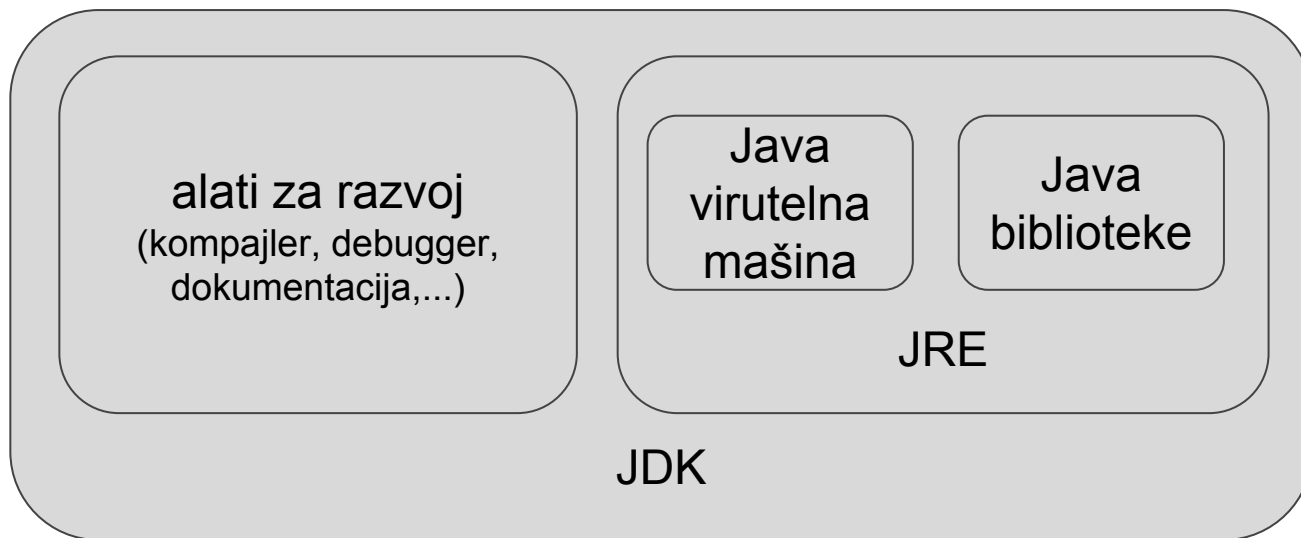


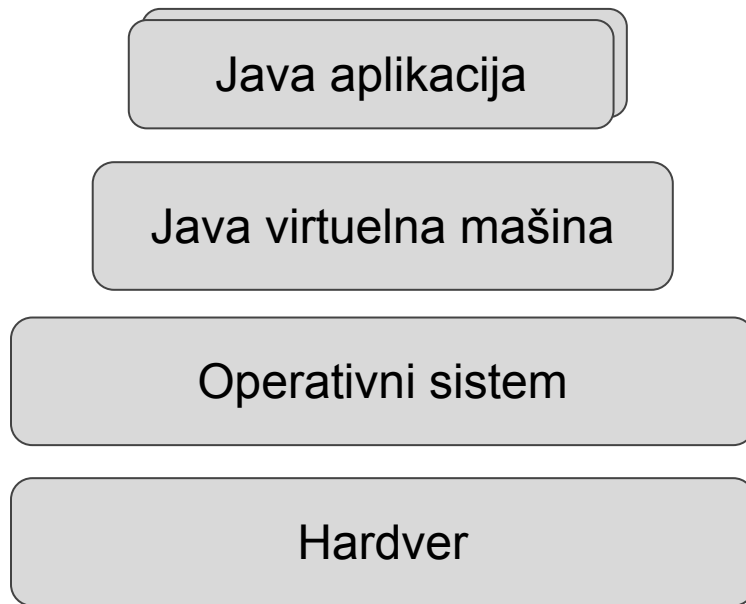
# Uvod u programiranje - vežbe

osnove Java programskog jezika, primitivni tipovi, operatori

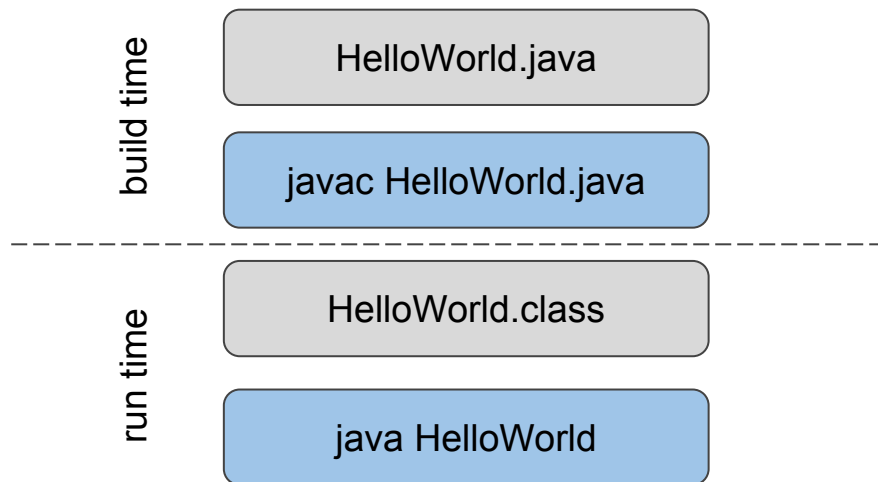
# JRE i JDK



# Java virtuelna mašina



# Faze pisanja i izvršavanja Java programa



## HelloWorld.java

```
public class HelloWorld {
    public static void main(String[] args) {
        System.out.println("Hello world!");
    }
}
```

## HelloWorld.class

```
Eřšž 3 <init> ()V Code LineNumberTable
main ([Ljava/lang/String;)V SourceFile
HelloWorld.java Hello world!
HelloWorld java/lang/Object java/lang/System out
Ljava/io/PrintStream; java/io/PrintStream println
(Ljava/lang/String;)V ! *~ a
% . ś a
```

## javap -c HelloWorld

```
public class HelloWorld {
    public HelloWorld();
    Code:
        0: aload_0
        1: invokespecial #1 // Method java/lang/Object."<init>":()V
        4: return

    public static void main(java.lang.String[]);
    Code:
        0: getstatic #2 // Field java/lang/System.out:Ljava/io/PrintStream;
        3: ldc #3 // String Hello world!
        5: invokevirtual #4 // Method java/io/PrintStream.println:(Ljava/lang/String;)V
        8: return
}
```

# Primitivni tipovi

Tip	Veličina	Vrednosti
boolean	“1 bit”	true ili false
char	16 bitova	\u0000 do \uFFFF
byte	8 bitova	-128 do 127
short	16 bitova	-32768 do 32767
int	32 bita	-2147483648 do 2147483647
long	64 bita	-9223372036854775808 do 9223372036854775807
float	32 bita	$\pm 1.40129846432481707e-45$ do $\pm 3.40282346638528860e+38$
double	64 bita	$\pm 4.94065645841246544e-324d$ do $\pm 1.79769313486231570e+308d$

# Wrapper klase (omotači)

<b>primitivni tipovi</b>	<b>wrapper klase</b>
boolean	Boolean
char	Character
byte	Byte
short	Short
int	Integer
long	Long
float	Float
double	Double



# Deklaracija primitivnih tipova

```
int a;  
int b, c;  
int d = 0;  
int e = 0, f = 3;  
int g = d;
```

```
boolean h = true;  
boolean i = false;
```

```
char j = 'a';
```



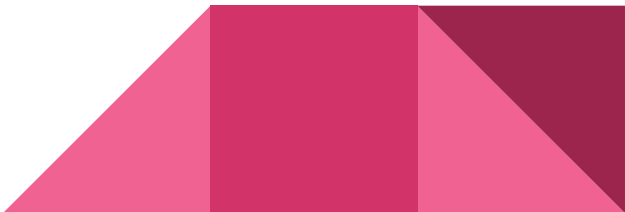


# Literali za primitivne tipove

```
10      // decimalan broj
010     // oktalni zapis
0x10    // heksadecimalni zapis
0b10    // binarni zapis
1e2     // eksponencijalni zapis

101     // long (l≠1)
10L     // takođe long
10.5f   // float
10.5F   // takođe float
10.5    // double

true    // boolean
false   // boolean
'a'     // char
'\n'    // char
'\u0061' // unicode 'a'
```



# Veličine objekata tipa int i Integer

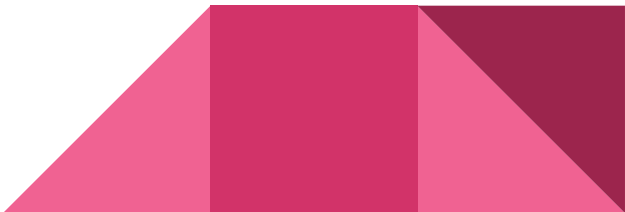
```
int a = 10;           // 32 bita  
Integer b = 10;      // 128 bita
```

Integer	
veličina	sadržaj
32 bita	Class (tip objekta: Integer)
32 bita	Flags (skup oznaka)
32 bita	Lock (za sinhronizaciju)
32 bita	int (vrednost)



# Boxing i Unboxing

```
class Test {  
  
    public static void main(String[] args) {  
        Integer a = 10;    // boxing  
        int b = a + 5;    // unboxing  
    }  
  
}
```



# Implicit cast vs. explicit cast

- implicitna konverzija sa 'užeg' na 'širi' tip podatka (widening)

`byte → short → int → long → float → double`

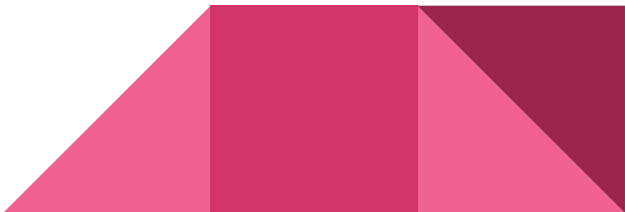
- eksplicitna konverzija (uz gubitke) sa 'šireg' na 'uži' tip podatka (narrowing)

```
double d = 1;
float f = (float) d;
long l = (long) f;
int i = (int) l;
short s = (short) i;
byte b = (byte) s;
```

## Primer gubitaka pri konverziji

```
int v1 = 1000000;
int v2 = (short) v1; // 16960
```

# Operatori

- aritmetički (+, -, \*, /, %, ++, --)
  - poređenja (==, !=, <, >, <=, >=)
  - logički (&&, ||, ^, !)
  - uslovni operator (? :)
  - nad bitovima (&, |, ^, <<, >>)
  - dodele (=, +=, -=, \*=, /=, %=)
  - objekata (instanceof)
- 

# Operacije i tipovi podataka

primeri aritmetičkih operacija (rezultat je “šireg” tipa)

```
2 + 1.0 // double
2 + 1F // float
2 + 1L // long
2 + 1 // int
```

primeri logičkih i operacija poređenja (rezultat je tipa boolean)

```
boolean test1 = 2 < 5; // true
boolean test2 = false && true; // false
```

primeri operacija nad bitovima (koriste se i nad logičkim i nad celobrojnim vrednostima)

```
int test3 = 1 ^ 2; // 3
boolean test4 = false & true; // false
```



# Sintaksa i konvencije nazivanja

HelloWorld.java

```
public class HelloWorld {  
    public static void main(String[] args) {  
        int zbir = 2 + 2;  
        System.out.println("2 + 2 = " + zbir);  
    }  
}
```

- naziv fajla = naziv klase .java
- naziv klase velikim početnim slovom
- izvršavanje počinje metodom main
- nazivi metoda i promenljivih malim slovom
- za nazivanje se koristi camel case
- naredbe se završavaju tačka-zarezom
- blokovi koda su ograničeni sa { }
- programski kod se smešta unutar klase
- komentari // i /\* \*/

# Unos podataka od strane korisnika

```
import java.util.Scanner;
public class Test {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        boolean booleanValue = scanner.nextBoolean(); // true ili false
        String stringValue = scanner.next();
        byte byteValue = scanner.nextByte();
        int intValue = scanner.nextInt();
        short shortValue = scanner.nextShort();
        long longValue = scanner.nextLong();
        float floatValue = scanner.nextFloat();
        double doubleValue = scanner.nextDouble();
    }
}
```

