VILNIAUS TECHNOLOGIJŲ IR VERSLO
PROFESINIO MOKYMO CENTRAS

02 – JAVA PAGRINDAI

Jaroslav Grablevski / Justina Balsė

Turinys

- Pirmoji programa;
- Išvedimo sakinys;
- Komentarai;
- Kintamieji*;
- Aritmetiniai operatoriai*;
- Duomenų įvedimas;
- Matematikos klasė *Math*;

**Tik pagrindai. Plačiau nagrinėsime vėliau.*

Hello World | Java

```java
public class PirmojiPrograma {

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

```java
public class PirmojiPrograma {

    public static void main(String[] args) {

        // Sentence 1
        // Sentence 2
        // ...
        // Sentence n

    }
}
```

Išvedimo sakinys (1)

```
public class PirmojiPrograma {

    public static void main(String[] args) {

        System.out.println("Hello World!");
        System.out.println("Labas pasauli!");
        System.out.println("...123@#$%^");

    }
}
```

```
Hello World!
Labas pasauli!
...123@#$%^
```

Išvedimo sakinys (2)

```
public class PirmojiPrograma {

    public static void main(String[] args) {

        System.out.println("Sakinys 1"); System.out.println("Sakinys 2");

        System.out.println("==============================================");

        System.out.print("Sakinys 3"); System.out.print("Sakinys 4");
    }
}
```

```
Sakinys 1
Sakinys 2
==============================================
Sakinys 3Sakinys 4
```

Kiekviena komanda/sakinys atskiriamas **kabliataškiu**.

```
System.out.println(); | System.out.print();
```

Komentarai | Comments (1)

- Programos tekstą padeda suprasti komentarai, kurie skirti programuotojui ir **visai neturi įtakos** programos vykdytojui.
- Java kalboje yra 3 skirtingi komentarų tipai:
  - Vienos eilutės komentaras;
  - Kelių eilučių komentaras;
  - *JavaDoc komentaras.*

Komentarai | Comments (2)

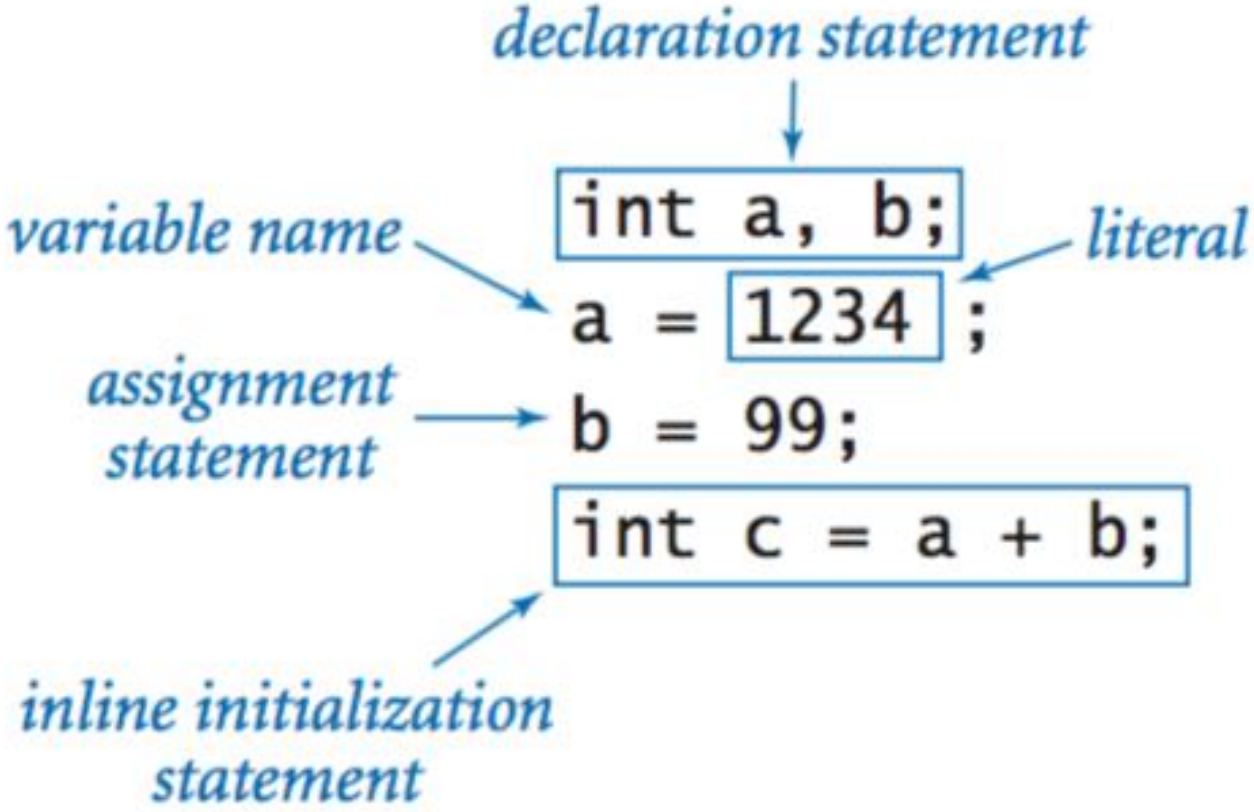
```
public class PirmojiPrograma {

    public static void main(String[] args) {

        // this is a single-line comment
        System.out.print("...");

        System.out.print("..."); // a single-line comment after code

        /* This is also a
        comment spanning
        multiple lines */

    }
}
```

Kintamieji | Variables

- Kintamieji skirti pradinių duomenų reikšmėms saugoti;
- Kintamasis turi tipą, vardą ir reikšmę;
  - Tipas – `int, double, char, String, ...;`
  - Vardas – `a, plotas, raide, pirmaZinute, ...;`
  - Reikšmė – `5, 2.99, ‘A‘, “Labas“, ...;`

```
int a = 5;
double plotas = 2.99;
char raide = 'A';
String pirmaZinute = "Labas";
```

Kintamieji | Variables



Primityvūs duomenų tipai |

TYPE NAME	KIND OF VALUE	MEMORY USED	SIZE RANGE
`boolean`	`true` or `false`	1 byte	Not applicable
`char`	Single character (Unicode)	2 bytes	Common Unicode characters
`byte`	Integer	1 byte	–128 to 127
`short`	Integer	2 bytes	–32768 to 32767
`int`	Integer	4 bytes	–2147483648 to 2147483647
`long`	Integer	8 bytes	–9223372036854775808 to 9223372036854775807
`float`	Floating-point number	4 bytes	$\pm 3.40282347 \times 10^{+38}$ to $\pm 1.40239846 \times 10^{-45}$
`double`	Floating-point number	8 bytes	$\pm 1.76769313486231570 \times 10^{+308}$ to $\pm 4.94065645841246544 \times 10^{-324}$

Kintamųjų vardai | Variable names

- Kintamojo vardui užrašyti galime naudoti
  - Lotyniškas raides (a-z, A-Z);
  - Skaičius (0-9);
  - Pabraukimo simbolį (_);
  - Dolerio simbolį ($);
- Kintamojo vardas privalo prasidėti raide (a-z, A-Z) arba pabraukimo simboliu (_);
- Pirmasis simbolis negali būti skaitmuo;
- Pavyzdžiai:

```
x1, y1, size, roomNumber, xMax, y_Max
```

Kintamieji | Variables

Properties of valid Identifiers	Properties of invalid identifiers
Unlimited length	Same spelling as a Java reserved word or keyword (see table 2.8)
Starts with a letter (a–z, upper- or lowercase), a currency sign, or an underscore	Uses special characters: `!`, `@`, `#`, `%`, `^`, `&`, `*`, `(`, `)`, `'`, `:`, `;`, `[`, `/`, `\`, `}`
Can use a digit (not at the starting position)	Starts with a Java digit (`0–9`)
Can use an underscore (in any position)	
Can use a currency sign (in any position): `$`, `£`, `¢`, `¥` and others	
Examples of valid identifiers	**Examples of invalid identifiers**
`customerValueObject`	`7world` (identifier can't start with a digit)
`$rate, £Value, _sine`	`%value` (identifier can't use special char `%`)
`happy2Help, nullValue`	`Digital!, books@manning` (identifier can't use special char `!` or `@`)
`Constant`	`null`, `true`, `false`, `goto` (identifier can't have the same name as a Java keyword or reserved word)

Raktiniai rezervuoti Java žodžiai

Java keywords and reserved words that can't be used as names for Java variables

abstract	default	goto	package	this
assert	do	if	private	throw
boolean	double	implements	protected	throws
break	else	import	public	transient
byte	enum	instanceof	return	true
case	extends	int	short	try
catch	false	interface	static	void
char	final	long	strictfp	volatile
class	finally	native	super	while
const	float	new	switch	
continue	for	null	synchronized	

Kintamųjų išvedimas (1)

```
String text = "includes text";
int wholeNumber = 123;
double decimalNumber = 3.141592653;

System.out.println("text value is " + text);
System.out.println("wholeNumber value is  " + wholeNumber);
System.out.println("decimalNumber value is " + decimalNumber);
```

```
text value is includes text
wholeNumber value is  123
decimalNumber value is 3.141592653
```

Kintamųjų išvedimas (2)

```
int wholeNumber;
wholeNumber = 123;
System.out.println("wholeNumber value is  " + wholeNumber);

wholeNumber = 42;
System.out.println("wholeNumber value is  " + wholeNumber);
```

```
wholeNumber value is  123
wholeNumber value is  42
```

TIK pirmą kartą aprašant kintamąjį nurodomas jo tipas!

Kintamųjų išvedimas (3)

```
int x = 5;
int y = -9;

System.out.println("x = " + x + ", y = " + y);
```

```
x = 5, y = -9
```

Aritmetiniai operatoriai (1)

```
int first = 9;
int second = 4;
int sum, sub, mul, div, mod;

sum = first + second;
sub = first - second;
mul = first * second;
div = first / second;
mod = first % second;

System.out.println("sum = " + sum);
System.out.println("sub = " + sub);
System.out.println("mul = " + mul);
System.out.println("div = " + div);
System.out.println("mod = " + mod);
```

```
sum = 13
sub = 5
mul = 36
div = 2
mod = 1
```

Aritmetiniai operatoriai (2)

```
int first = 9;
int second = 4;
int div, mod;
double d1, d2, d3;

div = first / second; // 2
mod = first % second; // 1

d1 = first / second;                // 2.0
d2 = first / (double) second;       // 2.25
d3 = (double) first / second;       // 2.25
```

Duomenų įvedimas (1)

```
import java.util.Scanner;

public class PirmojiPrograma {
    public static void main(String[] args) {

        Scanner reader = new Scanner(System.in);

        System.out.print("Type a word(String): ");
        String word = reader.nextLine();

        System.out.print("Type a number(integer): ");
        int numberInt = reader.nextInt();

        System.out.print("Type a number(double): ");
        double numberDouble = reader.nextDouble();

        reader.close();

        System.out.println(numberInt + " " + numberDouble + " " + word);
    }
}
```

Duomenų įvedimas (2)

```
import java.util.Scanner;

public class PirmojiPrograma {
    public static void main(String[] args) {

        Scanner reader = new Scanner(System.in);

        System.out.print("Type a word(String): ");
        String word = reader.nextLine();

        System.out.print("Type a number(integer): ");
        int numberInt = Integer.parseInt(reader.nextLine());

        System.out.print("Type a number(double): ");
        double numberDouble = Double.parseDouble(reader.nextLine());

        reader.close();

        System.out.println(numberInt + " " + numberDouble + " " + word);
    }
}
```

Matematikos klasė *Math* (1)

- Standartinė Java matematikos biblioteka;
- Biblioteką (klasę) aprašo elementarias matematines operacijas.
- Turi dvi konstantas: eulerio (E) ir pi (PI);

Matematikos klasė *Math* (2)

```
int a = -9;
int absolute = Math.abs(a); // 9

double b = 36;
double result = Math.sqrt(b); // 6

double x1 = 5.7, y1 = 8.99;
double maxResult = Math.max(x1, y1); // 8.99

double x2 = 2.3, y2 = -5.87;
double minResult = Math.min(x2, y2); // -5.87

double pi = Math.PI;

System.out.println(absolute + " " + result);
System.out.println(maxResult + " " + minResult + " " + pi);
```

02 - Praktiniai darbai

1. 02 - NPIK - Java pagrindai (PraktikaEN);
2. 02 - NPIK - Java pagrindai (PraktikaLT);