

## Pregled operatora, funkcija, naredbi i struktura

### Aritmetički operatori

$+, -, *, /$  - zbrajanje, oduzimanje, množenje, dijeljenje.

$^$  - potenciranje ( $x^y = x^y$ )

$x \text{ MOD } y$  - ostatak pri dijeljenju  $x$  s  $y$

x	y	x mod y
10	2	0
9	2	1
15	4	3
16	5	1

Računanje ostatka pri cijelobrojnem dijeljenju u mathematici:

$$10 : 2 = 5$$

$$-10$$

-----

= 0 ost.

$$13 : 4 = 3$$

$$-12$$

-----

=1 ost

### Prioritet

1. ( )
2.  $^$
3.  $*, /, \text{MOD}$
4.  $+, -$

### Matematičke funkcije

**ABS(x)** - apsolutna vrijednost broja  $x$

**SIN(x)** - sinus od  $x$  ( $x$  mora biti zadan u radijanima)

**COS(x)** - kosinus od  $x$  ( $x$  mora biti zadan u radijanima)

**LOG(x)** - prirodni logaritam broja  $x$  (baza je  $e=2.71828\dots$ ).  $x$  mora biti pozitivan.  
napomena:  $\text{LOG}(x)/\text{LOG}(10)$  daje logaritam po bazi 10

**SQR(x)** - korijen od  $x$  ( $x$  mora biti nenegativan)

**INT(x)** - uklanja decimalni dio broja

x	int(x)
5	5
-45	-45
2.56	2
-56.6	-56

Napomena: INT se često koristi za ispitivanje je li broj cijeli (IF  $x=\text{INT}(x)$  THEN ...)

**EXP(x) -  $e^x$**

**RND(x)** - slučajan broj iz intervala  $<0,1>$ ; vrijednost od  $x$  nije bitna

napomena: za generiranje cijelog broja u intervalu  $[a,b]$  koristiti  $\text{INT}(\text{RND}(x)*(b-a+1))+a$

### Znakovne funkcije

**LEN(a\$)** - duljina niza  $a$$

**LEFT\$(a\$,n)** - niz sastavljen od prvih  $n$  znakova slijeva u nizu  $a$$

**RIGHT\$(a\$,n)** - zadnjih  $n$  znakova zdesna u nizu  $a$$

**MID\$(a\$,x,n)** - vraća  $n$  znakova iz niza  $a$$  počevši od  $x$ -tog

**LOWER\$(a\$)** - niz dobiven pretvaranjem svih slova niza  $a$$  u mala

**UPPER\$(a\$)** - niz dobiven pretvaranjem svih slova niza  $a$$  u velika

The image shows two windows from the Just BASIC v1.01 application. The left window is titled "Just BASIC v1.01 - C:\Program Files\Just BASIC v1..." and contains a code editor with the following BASIC code:

```
PRINT 2 + 9 * 4 / 3 ^ 2
PRINT 1 * 2 + 3 + 12 * 3 / 2 * 3
PRINT 8 / 4 - 10 MOD 3
PRINT 14 MOD 5 * 3
PRINT 20 MOD 6 * 2 + 3
PRINT 5 MOD 8 + 8 MOD 5
PRINT INT(15.98)
PRINT ABS(INT(10.25) - 15)
PRINT SQR(36), SQR(49), INT(SQR(40))
PRINT 8^(1/3)
PRINT (2^2 * 3^2)^(1/2)
PRINT SIN(90 * 3.141593 / 180)
PRINT COS(180 * 3.141593 / 180)
PRINT EXP(1), LOG(1)
PRINT LOG(EXP(1))
PRINT LOWER$("PRIMJENA RACUNALA")
PRINT UPPER$("calculator")
PRINT RIGHT$("MS Windows", 7)
PRINT LEFT$("MS Windows", 2)
PRINT MID$("MS Windows", 4, 3)
PRINT LEN("MS Windows")
```

The right window is titled "Execution of: C:\..." and displays the output of the executed code. The output is as follows:

Output	Value	Output	Value
6		59	
1		12	
7		8	
15		5	
6.0	7.0	6	
2.0		6.0	
1.0		-1.0	
2.71828183	0.0		
1.0		primjena racunala	
		CALCULATOR	
		Windows	
		MS	
		Win	
		10	

## Naredbe grananja Uvjetna struktura

### IF...END IF

```
IF uvjet THEN
    naredbe 1
ELSE
    naredbe 2
END IF
```

A screenshot of the Just BASIC v1.01 IDE. The code window contains the following BASIC code:

```
print "Koliko izostanaka ima student?"
input iz
if iz <5 then
    print "Zasluzio potpis!"
else
    print "Nije zasluzio potpis!"
end if
end
```

The status bar at the bottom says "Ready!"

A screenshot of the execution window titled "Execution of: untitled.bas". It shows the following interaction:

```
Koliko izostanaka ima student?
?4
Zasluzio potpis!
```

A screenshot of the execution window titled "Execution of: untitled.bas". It shows the following interaction:

```
Koliko izostanaka ima student?
?5
Nije zasluzio potpis!
```

## Selektivna struktura

### SELECT CASE... END SELECT

```
SELECT CASE
CASE izraz 1
    naredbe 1
CASE izraz 2
    naredbe 2
...
CASE ELSE
    naredbe n
```

```
END SELECT
```

A screenshot of the Just BASIC v1.01 IDE. The code window contains the following BASIC code:

```
PRINT "Upiši broj ---> ";
INPUT b
SELECT CASE
    CASE b > 0
        PRINT "Pozitivan broj"
    CASE b = 0
        PRINT "Broj je jednak nuli"
    CASE ELSE
        PRINT "Negativan broj"
END SELECT
END
```

The status bar at the bottom says "Ready!"

A screenshot of the execution window titled "Execution of: un...". It shows the following interaction:

```
Upiši broj ---> ?25
Pozitivan broj
```

The screenshot shows two windows of the Just BASIC v1.01 IDE. The left window displays the following BASIC code:

```

PRINT "Prvi broj ---> ";
INPUT a
PRINT "Drugi broj ---> ";
INPUT b
SELECT CASE
CASE a > b
    r = a - b
    PRINT "Razlika prvog i drugog broja: "; r
CASE a < b
    u = a * b
    PRINT "Umnožak učitanih brojeva: "; u
CASE ELSE
    PRINT "Brojevi su jednaki"
END SELECT
END

```

The right window shows the execution results:

```

Prvi broj ---> ?5
Drugi broj ---> ?6
Umnožak učitanih brojeva: 30

```

## Petlje

**Petlja s brojačem - FOR...NEXT** - ponavljanje dijela programa određeni broj puta

FOR i = početak TO kraj STEP korak  
 naredbe...  
 NEXT i

The screenshot shows three windows of the Just BASIC v1.01 IDE demonstrating FOR...NEXT loops.

- The first window shows the code: `FOR i=1 TO 10 STEP 2 PRINT i NEXT i`. The output window shows the numbers 1, 3, 5, 7, 9.
- The second window shows the code: `FOR i = 20 TO 1 STEP -5 PRINT i NEXT i`. The output window shows the numbers 20, 15, 10, 5.
- The third window shows the code: `FOR i = 10 TO 20 STEP 5 PRINT i NEXT i`. The output window shows the numbers 10, 15, 20.

## Uvjetna petlja

**DO...LOOP** - ponavljanje dijela programa sve dok je zadovoljen određeni uvjet tj. dok je uvjet "TRUE" (**WHILE**) ili dok se uvjet ne zadovolji, tj. dok uvjet ne postane "TRUE" (**UNTIL**).

### Testiranje uvjeta na početku

DO WHILE uvjet naredbe... LOOP	DO UNTIL uvjet naredbe... LOOP
--------------------------------------	--------------------------------------

The image shows three windows of the Just BASIC v1.01 IDE. The left window contains the following code:

```
b=0
DO WHILE b<10
    b=b+1
    PRINT b
LOOP
```

The middle window contains:

```
b=50
DO UNTIL b<40
    PRINT b
    b=b-1
LOOP
```

The right window contains:

```
50
49
48
47
46
45
44
43
42
41
40
```

### Testiranje uvjeta na kraju

DO  
naredbe...  
LOOP WHILE uvjet

DO  
naredbe...  
LOOP UNTIL uvjet

The left window shows a program that prompts for a natural number and then prints it three times:

```
b=0
PRINT "Upiši prirodan broj"
DO
    b=b+1
    INPUT n
LOOP WHILE not(n > 0 and n=INT(n))
PRINT "Broj pokušaja: ";b
END
```

The right window shows the execution of this program, with the user input and the resulting output:

**Execution...**

```
Upiši prirodan broj
?0
?2.5
?1
Broj pokušaja: 3
```

**Just BASIC v1.01 - untitled.bas**

```
b=0
PRINT "Upiši prirodan broj"
DO
    b=b+1
    INPUT n
LOOP WHILE not(n > 0 and n=INT(n))
PRINT "Broj pokušaja: ";b
END
```

**Execution o...**

```
Upiši prirodan broj
?0
?2.5
?1
Broj pokušaja: 3
```

The left window shows a program that prompts for a natural number within a specific range and prints it three times:

```
b=0
DO
    b=b+1
    PRINT "Upiši prirodan broj iz segmenta [10, 50]"
    INPUT x
LOOP UNTIL x=INT(x) AND x>=10 AND x<=50
PRINT "Broj pokušaja: ";b
END
```

The right window shows the execution of this program, with the user input and the resulting output:

**Execution of: untitled.bas com...**

```
Upiši prirodan broj iz segmenta [10, 50]
?9
Upiši prirodan broj iz segmenta [10, 50]
?10.5
Upiši prirodan broj iz segmenta [10, 50]
?10
Broj pokušaja: 3
```

**Just BASIC v1.01 - untitled.bas**

```
b=0
DO
    b=b+1
    PRINT "Upiši prirodan broj iz segmenta [10, 50]"
    INPUT x
LOOP UNTIL x=INT(x) AND x>=10 AND x<=50
PRINT "Broj pokušaja: ";b
END
```