



L#4

Basics of Programming. Introduction

Course Basics of Programming Semester 1, FIIT

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Loops: definitions

- pascalAbc.net provides a number of loops that you can use to implement iteration logic. They are *loops*, *for* loops, *while* loops, and *repeat* loops.
- Loop consists on loop **header** and loop **body**
- One iteration of loop is one repetition of loop body

loop loop

repeat 10 times

```
loop 10 do  
  Print(1);
```

```
1 1 1 1 1 1 1 1 1 1
```

```
var i := 1;  
loop 10 do  
begin  
  Print(i);  
  i += 1;  
end;
```

```
1 2 3 4 5 6 7 8 9 10
```

```
var i := 10;  
loop 10 do  
begin  
  Print(i);  
  i -= 1;  
end;
```

```
10 9 8 7 6 5 4 3 2 1
```

```
var i := 1;  
loop 8 do  
begin  
  Print(i);  
  i *= 2;  
end;
```

```
1 2 4 8 16 32 64 128
```

Tasks

- To do: Lesson # 6, Tasks, loop: 1, 2, 3, 4, 5, 6

For loops

- The *for* loop executes a block of code again and again until the specified expression evaluates to *false*. *For* loop has a syntax:

```
begin
  for var i:=1 to 10 do
  begin
    // code to repeat goes here
  end;
end.
```

- For loop is a loop with **counter**
- At the end of each loop iteration,
the loop counter increments **by 1**

i – loop counter.
i defines in loop header

```
for var i := 1 to 10 do
  Print(i);
```

1 2 3 4 5 6 7 8 9 10

For loops

```
for var i := 1 to 10 do  
  Print(i);
```

```
1 2 3 4 5 6 7 8 9 10
```

Equivalent loop "loop"

```
var i := 1;  
loop 10 do  
begin  
  Print(i);  
  i += 1;  
end;
```

```
1 2 3 4 5 6 7 8 9 10
```

for ... downto

- For loop with **downto** keyword
- After each iteration counter decrements by 1

i – loop counter.
i defines in loop header

```
for var i := 10 downto 1 do  
  Print(i);
```

10 9 8 7 6 5 4 3 2 1

For loop and Equivalent loop loop

```
for var i := 10 downto 1 do  
  Print(i);
```

```
10 9 8 7 6 5 4 3 2 1
```

~

```
var i := 10;  
loop 10 do  
begin  
  Print(i);  
  i -= 1;  
end;
```

```
10 9 8 7 6 5 4 3 2 1
```


Tasks

- To do: Lesson # 6, Tasks, for loop: 1, 2, 3

while & repeat loops

- A *while* loop enables you to execute a block of code while a given condition is *true*

```
while condition do  
    statement
```

```
repeat  
    statements  
until condition
```

- *Repeat..until* loop will always execute the body of the loop at least once

while & repeat loops

```
while condition do  
  statement
```

```
repeat  
  statements  
until condition
```

Examples

```
var x := 0;  
while x < 5 do  
begin  
  Print(x);  
  x += 1;  
end;
```

```
var x := 0;  
repeat  
  Print(x);  
  x += 1;  
until x >= 5;
```

Tasks

- To do: Lesson # 6, Task, while & repeat loop: 1, 2, 3, 4, 5, 6, 7



Q & A