4 – CIKLINIAI ALGORITMAI

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Turinys

- Increment/Decrement;
- Nežinomo kartojimų skaičiaus ciklas WHILE;
- *break*
- Žinomo kartojimų skaičiaus ciklas FOR;
- Sumos algoritmas
- Kiekio algoritmas
- *continue*

Increment/Decrement

```java
int x = 5;

// Increment
x++;        // x = x + 1;
System.out.println("x = " + x); // 6

// Decrement
int y = 10;
y--;        // y = y - 1;
System.out.println("y = " + y); // 9
```

Prefix/postfix

Operator	Operator name	Sample expression	Explanation
++	prefix increment	++a	Increment **a** by 1, then use the new value of **a** in the expression in which **a** resides.
++	postfix increment	a++	Use the current value of **a** in the expression in which **a** resides, then increment **a** by 1.
--	prefix decrement	--b	Decrement **b** by 1, then use the new value of **b** in the expression in which **b** resides.
--	postfix decrement	b--	Use the current value of **b** in the expression in which **b** resides, then decrement **b** by 1.

Nežinomo kartojimų skaičiaus ciklas **WHILE**

```
// while-do loop
while ( test ) {
    body;
}
```
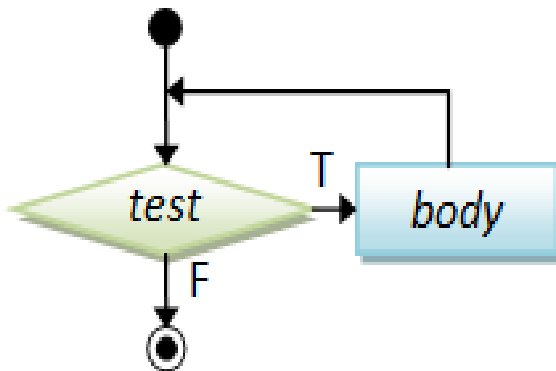
```
// do-while loop
do {
    body;
}
while ( test ) ;
```
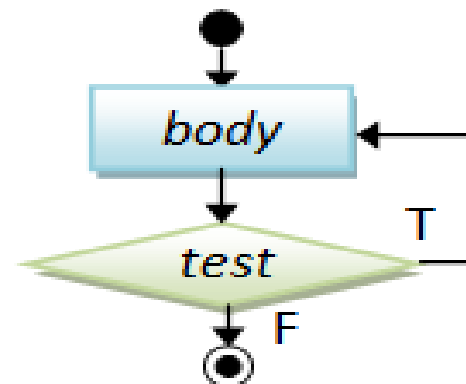
Pavyzdys while

```java
int i = 0;
while (i < 11) {
    System.out.print(i + " ");
    i++;
}
// 0 1 2 3 4 5 6 7 8 9 10
```

Pavyzdys do while

```java
int count = 1;
do {
    System.out.print(count + " ");
    count++;
} while (count < 11);
```

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

Pavyzdys infinite loop

```
while (true) {
    System.out.println("I can program!");
}
```

```
int i=10;
while(i>1)
{
    System.out.println(i);
      i++;
}
```

Pavyzdys | break

```java
Scanner reader = new Scanner(System.in);

while (true) {
    System.out.println("I can program!");

    System.out.print("Continue? ('no' to quit)? ");
    String command = reader.nextLine();
    if (command.equals("no")) {
        break;
    }
}

System.out.println("Thank you and see you later!");

reader.close();
```

```
I can program!
Continue? ('no' to quit)? Hi
I can program!
Continue? ('no' to quit)? Hello
I can program!
Continue? ('no' to quit)? Bye
I can program!
Continue? ('no' to quit)? no
Thank you and see you later!
```

Praktika

04 – Praktiniai darbai

04 - Cikliniai algoritmai (PraktikaEN)

Žinomo kartojimų skaičiaus ciklas **FOR**

```
for (/*Initialization*/ ; /*Condition*/ ; /* Iteration */) {
     /* loop body */
   }
```

```
for (/*inicializacija*/; /*loginė-išraiška*/; /*kitimo-žingsnis*/) {
    // kartojami sakiniai
}
```

Pavyzdys (1)

```java
for (int i = 0; i<6; i++) {
  System.out.println("i is " + i);
}
```

```
i is 0
i is 1
i is 2
i is 3
i is 4
i is 5
```

Pavyzdys (2)

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

    int a = 5, b = 9;

    for(int i=a; i<b; i++){
        System.out.println("i = " + i);
    }
}
```

```
i = 5
i = 6
i = 7
i = 8
```

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

    int a = 5, b = 15;

    for(int i=a; i<b; i=i+2){
        System.out.println("i = " + i);
    }
}
```

```
i = 5
i = 7
i = 9
i = 11
i = 13
```

Pavyzdys (3)

```java
int a = 1;
for(int i=5; i<11; i++){
    a = a * i;
    System.out.println("Kai i = " + i +", tai a = " + a);
}
```

```
Kai i = 5, tai a = 5
Kai i = 6, tai a = 30
Kai i = 7, tai a = 210
Kai i = 8, tai a = 1680
Kai i = 9, tai a = 15120
Kai i = 10, tai a = 151200
```

Pavyzdys (4) | FOR ir IF

Parenkite programą, kuri atspausdintų visus dviženklius skaičius dalius iš 6.

```java
for (int i=10; i<100; i++){
    if (i % 6 == 0)
        System.out.print(i + " ");
}
```

```
12 18 24 30 36 42 48 54 60 66 72 78 84 90 96
```

Pavyzdžiai* (5)

```java
for (int x = 1; x < 2; x++) {
    System.out.println(x); // Legal
    }
    System.out.println(x); // Not Legal! x is now out of scope
    // and can't be accessed.
```

```java
for (int i = 0, j = 0; (i < 10) && (j < 10); i++, j++) {
    System.out.println("i is " + i + " j is " + j);
}
```

```java
int i = 0;
for (;i<10;) {
 i++;
 // do some other work
}
```

Sumos algoritmas

```java
int sum = 0;
for (int i = 0; i < 11; i++) {
    sum = sum + i; // sum+=i;
}
System.out.println("sum = " + sum);
```

```
sum = 55
```

Kiekio algoritmas

```java
int count = 0;
for (int i = 13; i < 24; i++) {
    if (i % 3 == 0) {
        count = count + 1; // count++
    }
}
System.out.println("count = " + count); // count = 3
```

Nested loops

```java
int size = 8;
for (int row = 1; row <= size; ++row) { // Outer loop
    for (int col = 1; col <= size; ++col) { // Inner loop
        System.out.print("# ");
    }
    System.out.println();
}
```

```
# # # # # # # #
# # # # # # # #
# # # # # # # #
# # # # # # # #
# # # # # # # #
# # # # # # # #
# # # # # # # #
# # # # # # # #
```

continue

```java
double f = 0;
for(int i=-3; i<4; i++){

    if (i == 0)
        continue;

    f = (double) 1 / i;
    System.out.println("f(" + i + ") = " + f);
}
```

```
f(-3) = -0.3333333333333333
f(-2) = -0.5
f(-1) = -1.0
f(1) = 1.0
f(2) = 0.5
f(3) = 0.3333333333333333
```

labeled *continue* and *break*

```java
boolean isTrue = true;
outer: for (int i = 0; i < 5; i++) {
    while (isTrue) {
        System.out.println("Hello");
        break outer;
    } // end of inner while loop
    System.out.println("Outer loop."); // Won't print
} // end of outer for loop
System.out.println("Good-Bye");
```

```
Hello
Good-Bye
```

Praktika

04 – Praktiniai darbai:

04 - Cikliniai algoritmai (PraktikaLT)

04 - Cikliniai algoritmai (PraktikaNestedLoops)