Napredno programiranje i programski jezici

02 Uvod

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Prethodno predavanje

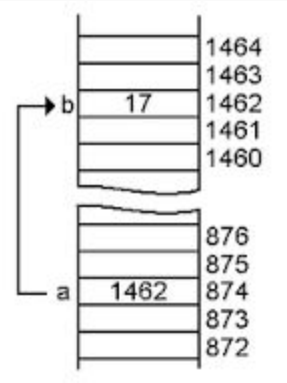
C → C++
osnovna struktura programa
osnovni elementi jezika

```cpp
#include <iostream>

using namespace std;

int main()
{
    cout << "Hello world!" << endl;

    int x = 5;
    cout << "x = " << x << endl;

    return 0;
}
```

POKAZIVAČI

```
int  *p;
```

Pokazivač je promenljiva čija vrednost je neka adresa



b je promenljiva tipa int

a je pokazivač

pointer, pointers ("pointeri")

```
int *p1 , *p2;
int *pok;
int *ptr;
```

imenovanje

```
int *p;
int * p;
int* p;
```

zapis

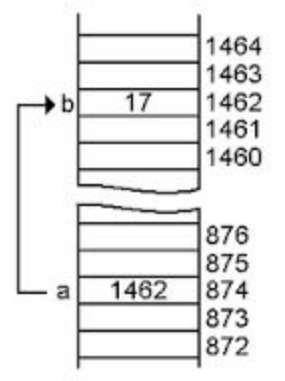
```
int *p, a;
int *p, *a;
```

deklaracija / obratiti pažnju

```
int x;
int *p;
p = &x;
```

Vrednost promenljive p je adresa promenljive x.

&
operator adresiranja
operand je promenljiva



b je promenljiva tipa int

a je pokazivač

```
int b = 17;
int *a;
a = &b;
```

```
int main()
{
    int x;
    cout << "x = " << x << endl;
    x = 5;
    cout << "x = " << x << endl;

    int *p;
    cout << "p = " << p << endl;
    p = &x;
    cout << "p = " << p << endl;

    return 0;
}
```

```
x = 7012224
x = 5
p = 0x41c37e
p = 0x6afee8
```

```cpp
int main()
{
    int x = 5;
    cout << "x = " << x << endl;
    cout << "&x = " << &x << endl;

    int *p = &x;
    cout << "p = " << p << endl;
    cout << "&p = " << &p << endl;

    return 0;
}
```

```
x = 5
&x = 0x6afeec
p = 0x6afeec
&p = 0x6afee8
```

```
int main()
{
    int x = 5;
    int *p = &x;

    int y = *p;

    return 0;
}
```

dereferenciranje

```
int main()
{
    int x = 5;
    int *p = &x;

    *p = 3;
    cout << "x = " << x;
    return 0;
}
```

Šta će biti ispisano?

```
int main()
{
    int x = 5;
    int *p = &x;

    cout << "x = " << x << endl;
    cout << "&x = " << &x << endl;
    cout << "*x = " << *x << endl;
    cout << "p = " << p << endl;
    cout << "&p = " << &p << endl;
    cout << "*p = " << *p << endl;

    return 0;
}
```

Gde je greška?
Šta će biti ispisano?

```
int x, y;
int *px, * py;

x = 5; y = 2;
px = &x; py = &y;

x = y;
```

```
int x, y;
int *px, * py;

x = 5; y = 2;
px = &x; py = &y;

x = y;
y = 3;
```

```
int x, y;
int *px, * py;

x = 5; y = 2;
px = &x; py = px;

*px = 3;
```

```
int x, y;
int *px, * py;

x = 5; y = 5;
px = &x; py = &y;

px == py FALSE
```

```
int x, y;
int *px, * py;

x = 5; y = 2;
px = &x; py = &x;

px == py TRUE
```

```
int x, y;
int *px, *py;

x = 5; y = 2;
px = &x; py = &y;

py = px + 1;
```

```
int x, y;
int *px, *py;

x = 5; y = 2;
px = &x; py = &y;

*py = *px + 1;
```

Paziti

```
int x, y;
int *px, *py;

x = 5; y = 2;
px = &x; py = &y;

*py = *px + 1;

cout << "x = " << x << " y = " << y << endl;
cout << "px = " << px << " py = " << py << endl;
cout << "*px = " << *px << " *py = " << *py << endl;

px = px + 1;
cout << "x = " << x << " y = " << y << endl;
cout << "px = " << px << " py = " << py << endl;
cout << "*px = " << *px << " *py = " << *py << endl;
```

```
int x, y;
int *px, *py;

x = 5; y = 2;
px = &x; py = &y;

*py = *px + 1;

cout << "x = " << x << " y = " << y << endl;
cout << "px = " << px << " py = " << py << endl;
cout << "*px = " << *px << " *py = " << *py << endl;

px = px + 1;
cout << "x = " << x << " y = " << y << endl;
cout << "px = " << px << " py = " << py << endl;
cout << "*px = " << *px << " *py = " << *py << endl;
```

```
x = 5 y = 6
px = 0x6afed4 py = 0x6afed0
*px = 5 *py = 6

x = 5 y = 6
px = 0x6afed8 py = 0x6afed0
*px = 7012048 *py = 6
```

sizeof(T)

NIZOVI

```
int niz[10];
```

```
int niz[10];

niz[5] = 42;
cout << niz[5] << endl;
```

Šta će biti ispisano?

```
int niz[10];

niz[5] = 42;
cout << "niz[5] = " << niz[5] << endl;
cout << "niz[0] = " << niz[0] << endl;
```

Šta će biti ispisano?

```
int niz[10];

niz[5] = 42;
cout << "niz[5] = " << niz[5] << endl;
cout << "niz[0] = " << niz[0] << endl;
```

```
niz[5] = 42
niz[0] = 8
```

```
int niz[10];

niz[5] = 42;
cout << "niz[5] = " << niz[5] << endl;
cout << "niz[0] = " << niz[0] << endl;

cout << "niz = " << niz << endl;
```

Šta će biti ispisano?

```
int niz[10];

niz[5] = 42;
cout << "niz[5] = " << niz[5] << endl;
cout << "niz[0] = " << niz[0] << endl;

cout << "niz = " << niz << endl;
```

```
niz[5] = 42
niz[0] = 8
niz = 0x61fdf0
```

niz je pokazivač

```
int niz[10];

niz[0] = 500;
niz[5] = 42;
cout << "niz[5] = " << niz[5] << endl;
cout << "niz[0] = " << niz[0] << endl;

cout << "niz = " << niz << endl;
cout << "*niz = " << *niz << endl;
```

```
int niz[10];

niz[0] = 500;
niz[5] = 42;
cout << "niz[5] = " << niz[5] << endl;
cout << "niz[0] = " << niz[0] << endl;

cout << "niz = " << niz << endl;
cout << "*niz = " << *niz << endl;
```

```
niz[5] = 42
niz[0] = 500
niz = 0x61fdf0
*niz = 500
```

```
niz → &niz[0]
*niz → niz[0]
```

```
niz → &niz[0]
*niz → niz[0]


niz[0] → *(niz + 0)
niz[1] → *(niz + 1)
niz[2] → *(niz + 2)
...
niz[n] → *(niz + n)
```

```
int *pniz = (int*)malloc(10*sizeof(int))
```

dinamička alokacija memorije

ZADATAK

Napisati program koji određuje maksimalni element celobrojnog niza čiji kapacitet je 30.

```
int a[30], n = 0, i, maks;

while(n <= 0 || n > 30) {
   cout << "Unesite broj elemenata niza: ";
   cin >> n;
}

for(i = 0; i < n; i++) {
   cout << "Unesite broj a[" << i << "]= ";
   cin >> a[i];
}

maks = a[0];
for(i = 1; i < n; i++)
   if(a[i] > maks)
      maks = a[i];

cout << "Maksimalni element niza je: " << maks;
```