

# **Exerciții simple de Informatică și TIC, inițiere C++ și Python 3**

Volumul I

**Informatică  
inițiere C++ și Python 3**

**Elena-Maria Mărginean**

**Emilia-Loredana Pop**



Cluj-Napoca, 2024

## Cuprins

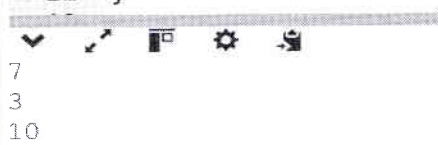
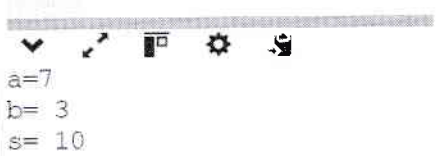
Introducere.....	5
Probleme structură liniară.....	7
Probleme structuri repetitive .....	19
Probleme structură alternativă .....	33
Probleme diverse .....	44
<b>Problemă interesantă: Stelele</b> .....	<b>64</b>
<b>Teste Online C++</b> .....	<b>67</b>
C++ Test 1 - Structură liniară .....	68
C++ Test 2 - Structuri repetitive .....	80
C++ Test 3 - Structuri alternative.....	92
C++ Test 4 - Probleme diverse.....	101
<b>Teste Online Python 3</b> .....	<b>113</b>
Python 3 Test 1 - Structură liniară .....	114
Python 3 Test 2 - Structuri repetitive .....	125
Python 3 Test 3 - Structuri alternative.....	137
Python 3 Test 4 - Probleme diverse.....	146
<b>Bibliografie</b> .....	<b>158</b>

„Omul cel cu pasiune este rege în orice lume.”

## Probleme structură liniară

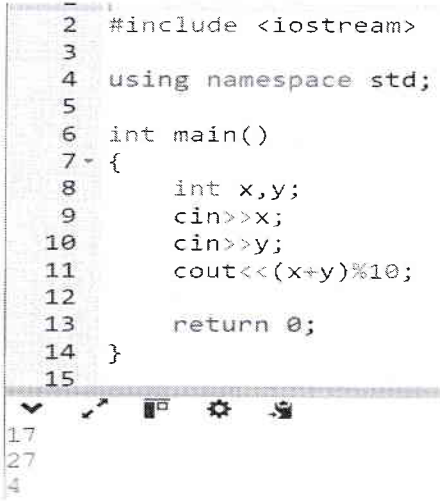
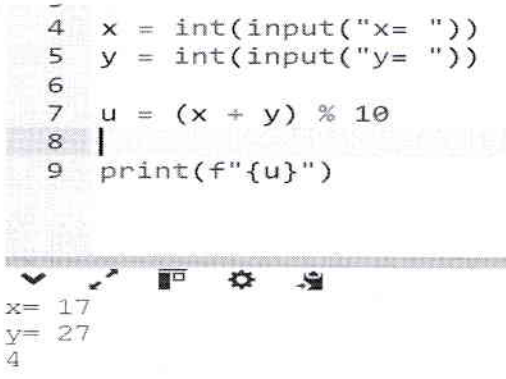
1. Se dau două numere naturale a și b, să se găsească suma lor.

( $1 \leq a, b < 1.000.000$ )

Rezolvare C++	Rezolvare Python 3
<pre>#include &lt;iostream&gt; using namespace std;  int main() {     int a,b,s;     cin&gt;&gt;a&gt;&gt;b;     s=a+b;     cout&lt;&lt;s;      -return 0; }</pre> <p><b>Rulare:</b></p> <pre>1 #include &lt;iostream&gt; 2 using namespace std; 3 4 int main() 5 { 6     int a,b,s; 7     cin&gt;&gt;a&gt;&gt;b; 8     s=a+b; 9     cout&lt;&lt;s; 10 11     return 0; 12 }</pre>  <p><a href="https://www.onlinegdb.com/Ir9DXqr-x">https://www.onlinegdb.com/Ir9DXqr-x</a></p>	<pre>a = int(input("a=")) b = int(input("b= "))  s = a + b  print(f's= {s}')</pre> <p><b>Rulare:</b></p> <pre>2 a = int(input("a=")) 3 b = int(input("b= ")) 4 5 s = a + b 6 7 print(f"s= {s}")</pre>  <p><a href="https://onlinegdb.com/mRdx6Srij1">https://onlinegdb.com/mRdx6Srij1</a></p>

2. Se dau două numere naturale  $x$  și  $y$ . Calculați ultima cifră a sumei lor.

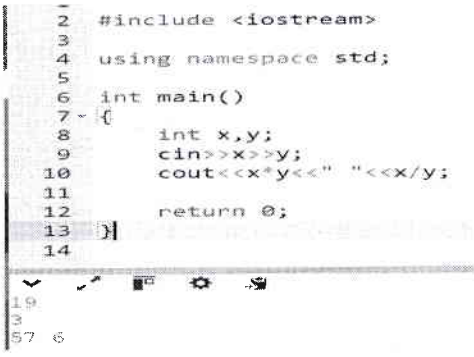
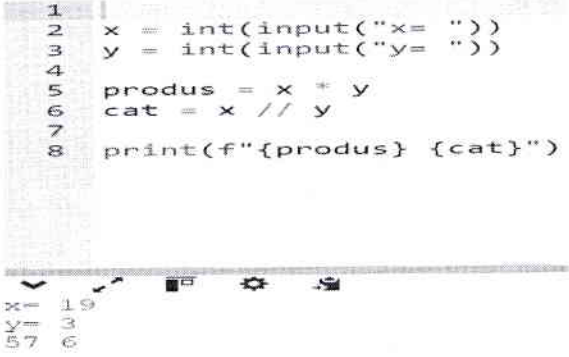
( $1 \leq x, y < 1.000.000$ )

Rezolvare C++	Rezolvare Python 3
<pre>#include &lt;iostream&gt; using namespace std;  int main() {     int x,y;     cin&gt;&gt;x;     cin&gt;&gt;y;     cout&lt;&lt;(x+y)%10;      return 0; }</pre> <p><b>Rulare:</b></p>  <p><a href="https://onlinegdb.com/ciddI8ZFD">https://onlinegdb.com/ciddI8ZFD</a></p>	<pre>x = int(input("x= ")) y = int(input("y= "))  u = (x + y) % 10  print(f"{u}")</pre> <p><b>Rulare:</b></p>  <p><a href="https://onlinegdb.com/TlgnSjwmf">https://onlinegdb.com/TlgnSjwmf</a></p>

„Cel mai important este ca, atunci când începi să înveți ceva nou, să prinzi avântul și starea care te duc în colțul magic al științei, de unde vei afla totul.”

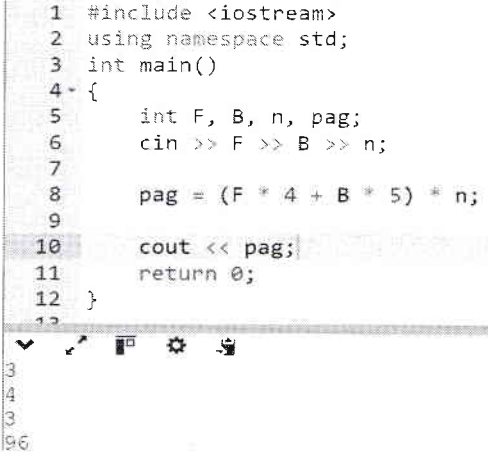
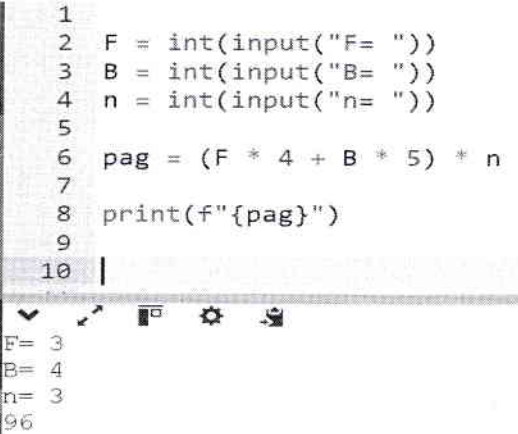
3. Se dau două numere naturale  $x$  și  $y$ . Calculați produsul și câtul lor.

(  $1 \leq x, y < 1.000.000$  )

Rezolvare C++	Rezolvare Python 3
<pre>#include &lt;iostream&gt; using namespace std;  int main() {     int x,y;     cin&gt;&gt;x&gt;&gt;y;     cout&lt;&lt;x*y&lt;&lt;" "&lt;&lt;x/y;      return 0; }</pre> <p><b>Rulare:</b></p>  <p><a href="https://onlinegdb.com/kW4G679IU">https://onlinegdb.com/kW4G679IU</a></p>	<pre>x = int(input("x= ")) y = int(input("y= "))  produs = x * y cat = x // y  print(f"{produs} {cat}")</pre> <p><b>Rulare:</b></p>  <p><a href="https://onlinegdb.com/K4mafKA_3">https://onlinegdb.com/K4mafKA_3</a></p>

**Felicitări pentru că ați parcurs cu succes primele trei probleme! Ați făcut un pas important în călătoria voastră de învățare și ați demonstrat că aveți curajul necesar pentru a depăși provocările.**

4. Într-o clasă sunt **F** fete și **B** băieți care lucrează la o carte de povești. Fiecare fată scrie **4** pagini **pe zi**, iar fiecare băiat scrie **5** pagini **pe zi**. Câte pagini vor scrie copiii în **n** zile?

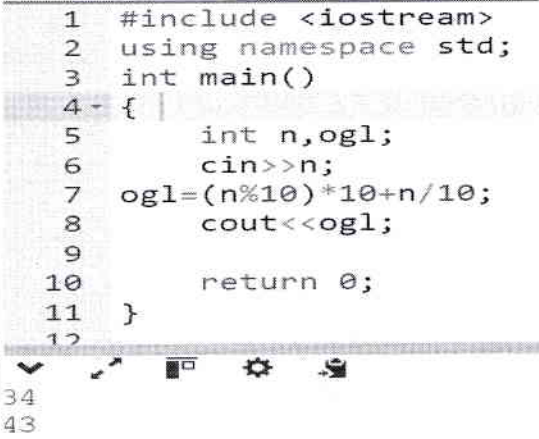
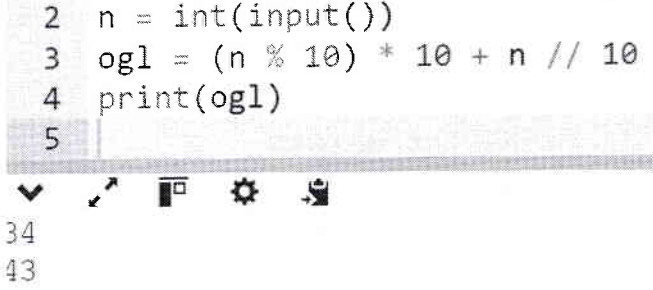
Rezolvare C++	Rezolvare Python 3
<pre>#include &lt;iostream&gt; using namespace std; int main() {     int F, B, n, pag;     cin &gt;&gt; F &gt;&gt; B &gt;&gt; n;      pag = (F * 4 + B * 5) * n;      cout &lt;&lt; pag;     return 0; }</pre> <p><b>Rulare:</b></p>  <p><a href="https://onlinegdb.com/nvMk75wcl">https://onlinegdb.com/nvMk75wcl</a></p>	<pre>x = int(input("x= ")) y = int(input("y= "))  produs = x * y cat = x // y  print(f'{produs} {cat}')</pre> <p><b>Rulare:</b></p>  <p><a href="https://onlinegdb.com/v3N3bPaKA">https://onlinegdb.com/v3N3bPaKA</a></p>

Mergeți înainte cu încredere și entuziasm!

5. Să se afișeze oglinditul unui număr natural „n” format din două cifre.

(  $10 \leq n < 100$  )

### Metoda 1

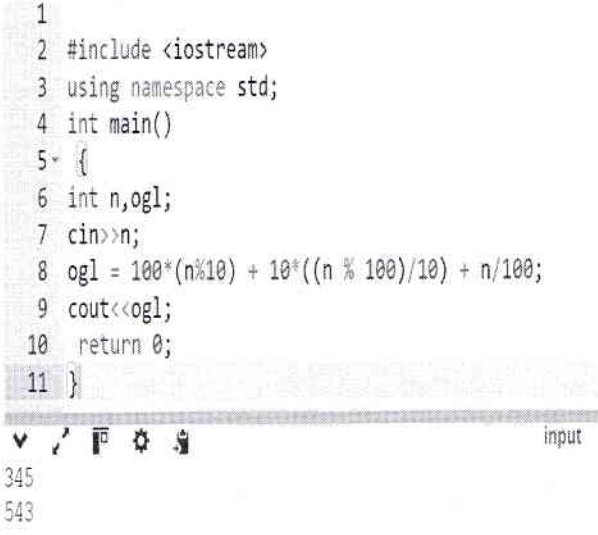
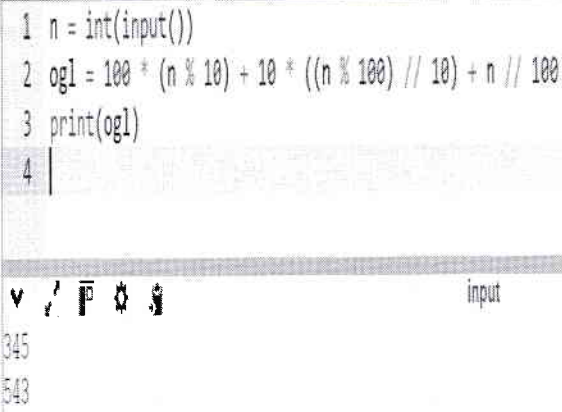
Rezolvare C++	Rezolvare Python 3
<pre>#include &lt;iostream&gt; using namespace std; int main() {     int n,og1;     cin&gt;&gt;n;     og1=(n%10)*10+n/10;     cout&lt;&lt;og1;     return 0; }</pre> <p><b>Rulare:</b></p>  <p><a href="https://onlinegdb.com/j80OPD-5r">https://onlinegdb.com/j80OPD-5r</a></p>	<pre>n = int(input()) og1 = (n % 10) * 10 + n // 10 print(og1)</pre> <p><b>Rulare:</b></p>  <p><a href="https://onlinegdb.com/X10L0IPjb">https://onlinegdb.com/X10L0IPjb</a></p>

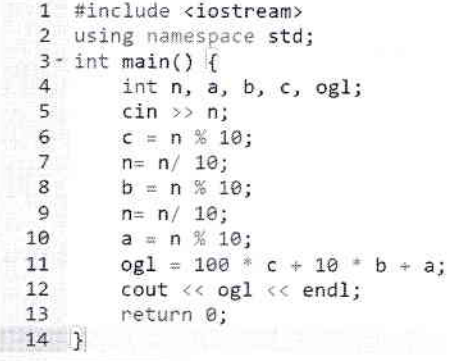
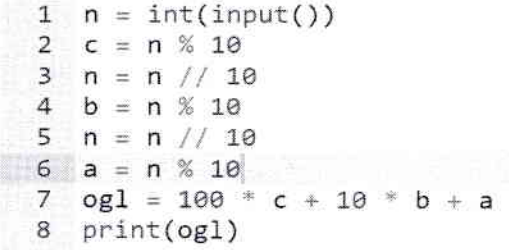
Rezolvare C++	Rezolvare Python 3
<pre>#include &lt;iostream&gt; #include &lt;iomanip&gt; using namespace std; int main() {     int n,a,b,ogl;     cin&gt;&gt;n;     b=n%10;     n=n/10;     a=n%10;     ogl=10*b+a;     cout&lt;&lt;ogl;     return 0; }</pre> <p><b>Rulare:</b></p> <pre>1 #include &lt;iostream&gt; 2 #include &lt;iomanip&gt; 3 using namespace std; 4 int main() 5 { 6     int n,a,b,ogl; 7     cin&gt;&gt;n; 8     b=n%10; 9     n=n/10; 10    a=n%10; 11    ogl=10*b+a; 12    cout&lt;&lt;ogl; 13    return 0; 14 }</pre> <p>34</p> <p>43</p> <p><a href="https://onlinegdb.com/0FcjRpYiT">https://onlinegdb.com/0FcjRpYiT</a></p>	<pre>n = int(input()) b = n % 10 n = n // 10 a = n % 10 ogl = 10 * b + a print(ogl)</pre> <p><b>Rulare:</b></p> <pre>1 n = int(input()) 2 b = n % 10 3 n = n // 10 4 a = n % 10 5 ogl = 10 * b + a 6 print(ogl) 7</pre> <p>34</p> <p>43</p> <p><a href="https://onlinegdb.com/Po2VvriO8">https://onlinegdb.com/Po2VvriO8</a></p>

6. Să se afișeze oglinditul unui număr natural „n” format din trei cifre.

(  $100 \leq n < 1000$  )

### Metoda 1

Rezolvare C++	Rezolvare Python 3
<pre>#include &lt;iostream&gt; using namespace std; int main() { int n,ogl; cin&gt;&gt;n; ogl = 100*(n%10) + 10*((n % 100)/10) + n/100; cout&lt;&lt;ogl; return 0; }</pre> <p><b>Rulare:</b></p>  <p><a href="https://onlinegdb.com/oPee6TVX9">https://onlinegdb.com/oPee6TVX9</a></p>	<pre>n = int(input()) ogl = 100 * (n % 10) + 10 * ((n % 100) // 10) + n // 100 print(ogl)</pre> <p><b>Rulare:</b></p>  <p><a href="https://onlinegdb.com/FVmqXf19K">https://onlinegdb.com/FVmqXf19K</a></p>

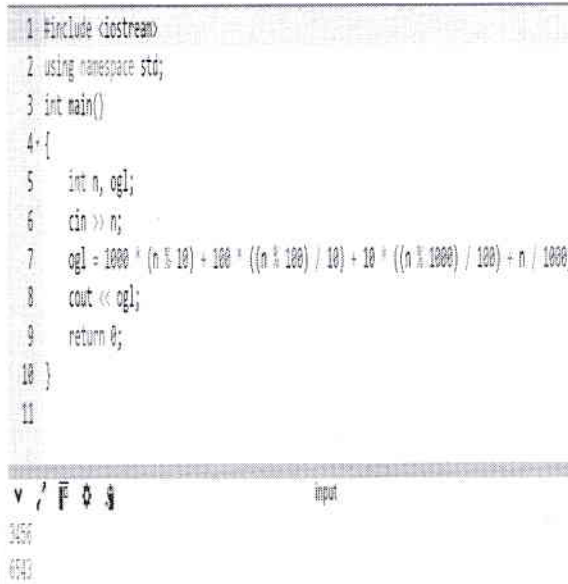
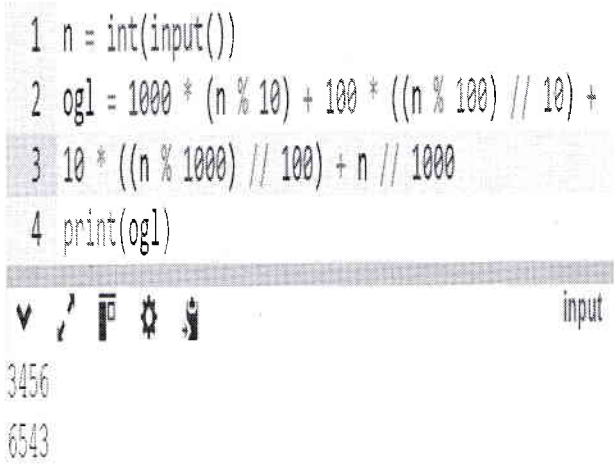
Rezolvare C++	Rezolvare Python 3
<pre>#include &lt;iostream&gt; using namespace std; int main() {     int n, a, b, c, ogl;     cin &gt;&gt; n;     c = n % 10;     n = n / 10;     b = n % 10;     n = n / 10;     a = n % 10;     ogl = 100 * c + 10 * b + a;     cout &lt;&lt; ogl &lt;&lt; endl;     return 0; }</pre> <p><b>Rulare:</b></p>  <p>345 543</p> <p><a href="https://onlinegdb.com/6xDGJcFrs">https://onlinegdb.com/6xDGJcFrs</a></p>	<pre>n = int(input()) c = n % 10 n = n // 10 b = n % 10 n = n // 10 a = n % 10 ogl = 100 * c + 10 * b + a print(ogl)</pre> <p><b>Rulare:</b></p>  <p>345 543</p> <p><a href="https://onlinegdb.com/wKCb7H3O-d">https://onlinegdb.com/wKCb7H3O-d</a></p>

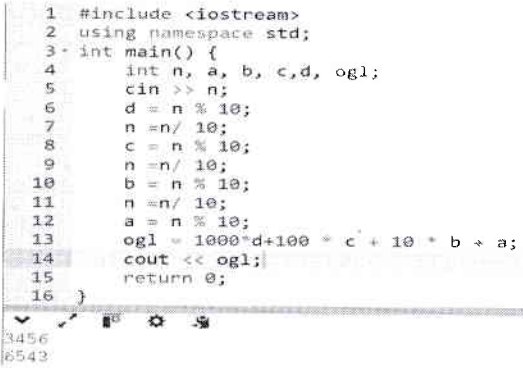
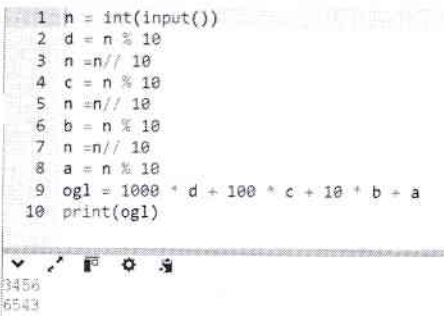
Credeți în voi înșivă și în abilitățile voastre!

7. Să se afișeze oglinditul unui număr natural „n” format din patru cifre.

(  $1000 \leq n < 10000$  )

### Metoda 1

Rezolvare C++	Rezolvare Python 3
<pre>#include &lt;iostream&gt; using namespace std; int main() {     int n, ogl;     cin &gt;&gt; n;     ogl = 1000 * (n % 10) + 100 * ((n % 100) / 10) + 10 * ((n % 1000) / 100) + n / 1000;     cout &lt;&lt; ogl;     return 0; }</pre> <p><b>Rulare:</b></p>  <p><a href="https://onlinegdb.com/vU_oXPXgUm">https://onlinegdb.com/vU_oXPXgUm</a></p>	<pre>n = int(input()) ogl = 1000 * (n % 10) + 100 * ((n % 100) // 10) + 10 * ((n % 1000) // 100) + n // 1000 print(ogl)</pre> <p><b>Rulare:</b></p>  <p><a href="https://onlinegdb.com/3dKVE4lvN">https://onlinegdb.com/3dKVE4lvN</a></p>

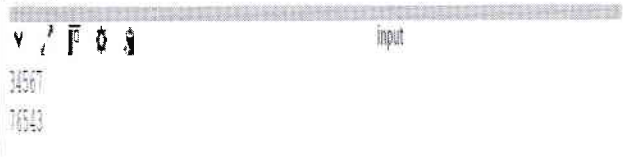

Rezolvare C++	Rezolvare Python 3
<pre>#include &lt;iostream&gt; using namespace std; int main() { int n, a, b, c,d, ogl; cin &gt;&gt; n; d = n % 10; n =n/ 10; c = n % 10; n =n/ 10; b = n % 10; n =n/ 10; a = n % 10; ogl = 1000*d+100 * c + 10 * b + a; cout &lt;&lt; ogl &lt;&lt; endl; return 0; }</pre> <p><b>Rulare:</b></p>  <p><a href="https://onlinegdb.com/a84MYAQb2">https://onlinegdb.com/a84MYAQb2</a></p>	<pre>n = int(input()) d = n % 10 n =n// 10 c = n % 10 n =n// 10 b = n % 10 n =n// 10 a = n % 10 ogl = 1000 * d + 100 * c + 10 * b + a print(ogl)</pre> <p><b>Rulare:</b></p>  <p><a href="https://onlinegdb.com/BKDzE4ia5">https://onlinegdb.com/BKDzE4ia5</a></p>

```
#include <iostream>
using namespace std;
int main()
{
cout << "Mergeți înainte cu încredere și entuziasm!";
return 0;
}
```

8. Să se afișeze oglinditul unui număr natural „n” format din cinci cifre.

(  $10000 \leq n < 100000$  )

### Metoda 1

Rezolvare C++	Rezolvare Python 3
<pre>#include &lt;iostream&gt; using namespace std; int main() {     int n, ogl;     cin &gt;&gt; n;     ogl = 10000 * (n % 10) + 1000 * ((n % 100) / 10) + 100 * ((n % 1000) / 100) + 10 * ((n % 10000) / 1000) + n / 10000;     cout &lt;&lt; ogl;     return 0; }</pre> <p><b>Rulare:</b></p> <pre>1 #include &lt;iostream&gt; 2 using namespace std; 3 int main() 4 { 5     int n, ogl; 6     cin &gt;&gt; n; 7     ogl = 10000 * (n % 10) + 1000 * ((n % 100) / 10) + 100 * ((n % 1000) / 100) 8     + 10 * ((n % 10000) / 1000) + n / 10000; 9     cout &lt;&lt; ogl; 10    return 0; 11 }</pre>  <p><a href="https://onlinegdb.com/fiGBRj8SE">https://onlinegdb.com/fiGBRj8SE</a></p>	<pre>n = int(input()) ogl = 10000 * (n % 10) + 1000 * ((n % 100) // 10) + 100 * ((n % 1000) // 100) + 10 * ((n % 10000) // 1000) + n // 10000 print(ogl)</pre> <p><b>Rulare:</b></p> <pre>1 n = int(input()) 2 ogl = 10000 * (n % 10) + 1000 * ((n % 100) // 10) 3 + 100 * ((n % 1000) // 100) 4 + 10 * ((n % 10000) // 1000) + n // 10000 5 print(ogl) 6</pre>  <p><a href="https://onlinegdb.com/x34s7Jk45U">https://onlinegdb.com/x34s7Jk45U</a></p>