C++ Programming

Division Operator

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Multiples

- 4 * 1 = 4, 4 * 2 = 8, 4*3 = 12, 4*4 = 16, 4 * 5 = 20, 4*6 = 24, …
- So for 4: 4, 8, 12, 16, 20, 24, 28, 32
- For 5: 5, 10, 15, 20, 25, 30, 35, 40, …
- What is the biggest multiple of 5 less than 30? 25

Division: Integer and fraction parts

- 6 / 2 = 3
- 12 / 2 = (6+6)/2 = 6/2 + 6/2 = 3 + 3 = 6
- 20 / 2 = (12 + 8)/2 = 6 + 4 = 10
- 21 / 2 = (20 + 1)/2 = 10+0.5 = 10.5 (integer part = 10, fraction part = 0.5)
- 25 / 5 = 5
- 26 / 5 = 25/5 + ⅕ = 5.2
- 27 / 5 = 25/5 + ⅖ = 5.4
- 28 / 5 = 25/5 + ⅗ = 5.6
- 29 / 5 = 25/5 + ⅘ = 5.8
- 30 / 5 = 30/5 = 6

Division in C++

06_1.cpp

```cpp
#include<iostream>
using namespace std;

int main() {
    cout << 25 / 5 << "\n";
    cout << 26 / 5 << "\n";
    cout << 27 / 5 << "\n";
    cout << 28 / 5 << "\n";
    cout << 29 / 5 << "\n";
    cout << 30 / 5 << "\n";
    cout << 31 / 5 << "\n";
    cout << "******\n";
    cout << 25 / 5.0 << "\n";
    cout << 26 / 5.0 << "\n";
    cout << 27.0 / 5 << "\n";
    cout << 28.0 / 5.0 << "\n";
    cout << 29.0 / 5.0 << "\n";
    cout << 30.0 / 5.0 << "\n";
    cout << 31.0 / 5 << "\n";

    return 0;
}
```

Console

<terminated>

```
5
5
5
5
5
6
6
******
5
5.2
5.4
5.6
5.8
6
6.2
```

- If both numbers are integers, only integer part is result
  - Fraction is ignored
  - E.g. 27/5 = 5.4 ⇒ 5
- If any of numbers in double style, then normal math
  - 27/5 ⇒ 5.4

Division by 10s

06_2.cpp

```cpp
#include<iostream>
using namespace std;

int main() {
    int num = 12345;

    cout<<num/10<<"\n";
    cout<<num/100<<"\n";
    cout<<num/1000<<"\n";
    cout<<num/10000<<"\n";
    cout<<num/100000<<"\n";

    cout<<"*********\n";

    cout<<num/10.0<<"\n";
    cout<<num/100.0<<"\n";
    cout<<num/1000.0<<"\n";
    cout<<num/10000.0<<"\n";
    cout<<num/100000.0<<"\n";


    return 0;
}
```

Console

<terminated> zte

```
1234
123
12
1
0
*********
1234.5
123.45
12.345
1.2345
0.12345
```

- Dividing by 10 removes last digit
- Dividing by 100 remove last 2 digits and so on
- Notice num/1000 is same as num/10/10/10

Even and odd

- Even number is divisible by 2
  - E.g. 2, 4, 6, 8, 10, 12, …
  - 8/2 = 4 ⇒ Even
  - So always **number.0**
- Odd number is not divisible by 2
  - E.g. 1, 3, 5, 7, 11, …
  - Let’s divide them by 2
  - ½ = 0.5
  - 3/2 = 1.5
  - So 0.5 1.5 2.5 3.5 4.5 5.5
  - Like 0.5 + (1, 2, 3, 4, 5….)
  - So always **number.5**

Conversions

06_4.cpp

```cpp
#include<iostream>
using namespace std;

int main() {
    // 8/3 = 2.6666666666666 ..... 6666
    double num = 8/3.0;

    cout<<num<<"\n";

    int res = (int)num; // casting
    cout<<res<<"\n";

    char ch = 'a';
    int ch_value = (int)ch;

    cout<<ch_value<<"\n";

    cout<<(int)'a'<<" "<<(int)'z'<<"\n";
    cout<<(int)'A'<<" "<<(int)'Z'<<"\n";


    return 0;
}
```

Console | Problems | Tasks | Properties

```
<terminated> ztemp [C/C++ Application] /home/moust
2.66667
2
97
97 122
65 90
```

- We can convert double to integer
  - The fraction part will be removed
- Notice also chars canverted to integer
  - Every letter has a number
  - E.g. small ‘a’ is 97
  - Notice why ‘A’ is smaller than ‘a’
- To convert using (int)something
  - This is C popular style
  - Later we will see C++ casting style
    - More safer & preferred

"Acquire knowledge and impart it to the people."

"Seek knowledge from the Cradle to the Grave."