

Rechnen mit Fließkommazahlen



Was ist die Ausgabe dieses Programms (standardmässig auf 6 Stellen gerundet)?

```
#include<iostream>

int main()
{
    double result = 0;

    for (double d = 1; d >= 1.0e-4; d /= 2)
        result += d;

    std::cout << result << "\n";
    return 0;
}
```

- 1 1
- 2 1.99988
- 3 1.99998
- 4 1.99999
- 5 2
- 6 2.00001
- 7 2.71828

Rechnen mit Fließkommazahlen



```
...  
double result = 0;  
for (double d = 1; d >= 1.0e-4; d /= 2)  
    result += d;  
...
```

■ $1.0e-4 = \frac{1}{10,000}$

1	1
2	1.99988
3	1.99998
4	1.99999
5	2
6	2.00001
7	2.71828

Rechnen mit Fließkommazahlen



```
...  
double result = 0;  
for (double d = 1; d >= 1.0e-4; d /= 2)  
    result += d;  
...
```

■ $1.0e-4 = \frac{1}{10,000}$

■ result:

$$1 + \frac{1}{2} + \frac{1}{4} + \dots + \frac{1}{8192}$$

- 1 1
- 2 1.99988
- 3 1.99998
- 4 1.99999
- 5 2
- 6 2.00001
- 7 2.71828

Rechnen mit Fließkommazahlen



```
...  
double result = 0;  
for (double d = 1; d >= 1.0e-4; d /= 2)  
    result += d;  
...
```

■ $1.0\text{e-}4 = \frac{1}{10,000}$

■ result:

$$1 + \frac{1}{2} + \frac{1}{4} + \dots + \frac{1}{8192}$$
$$= 2 - \frac{1}{8192}$$

- 1 1
- 2 1.99988
- 3 1.99998
- 4 1.99999
- 5 2
- 6 2.00001
- 7 2.71828

Rechnen mit Fließkommazahlen



```
...  
double result = 0;  
for (double d = 1; d >= 1.0e-4; d /= 2)  
    result += d;  
...
```

■ $1.0\text{e-}4 = \frac{1}{10,000}$

■ result:

$$1 + \frac{1}{2} + \frac{1}{4} + \dots + \frac{1}{8192}$$
$$= 2 - \frac{1}{8192} \approx 2 - \frac{12}{100,000}$$

- 1 1
- 2 1.99988
- 3 1.99998
- 4 1.99999
- 5 2
- 6 2.00001
- 7 2.71828

Rechnen mit Fließkommazahlen



```
...  
double result = 0;  
for (double d = 1; d >= 1.0e-4; d /= 2)  
    result += d;  
...
```

■ $1.0e-4 = \frac{1}{10,000}$

■ result:

$$1 + \frac{1}{2} + \frac{1}{4} + \dots + \frac{1}{8192}$$
$$= 2 - \frac{1}{8192} \approx 2 - \frac{12}{100,000}$$

1	1
2	1.99988
3	1.99998
4	1.99999
5	2
6	2.00001
7	2.71828

