const

Const-Guideline

Before you declare a variable, think about whether its value will be changed later or not!

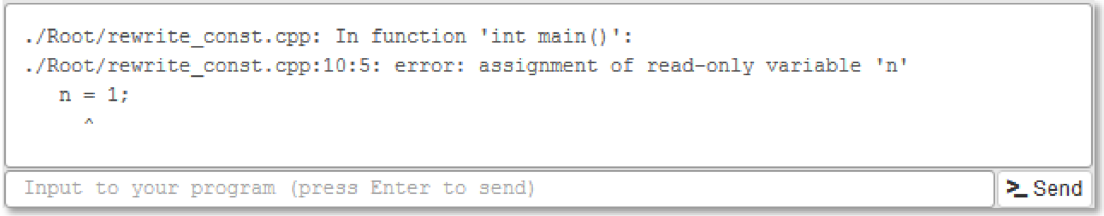
If not, use the keyword `const` to declare the variable as constant.

`const` – Necessary?

- Protects against unintended changes

`const` – Necessary?

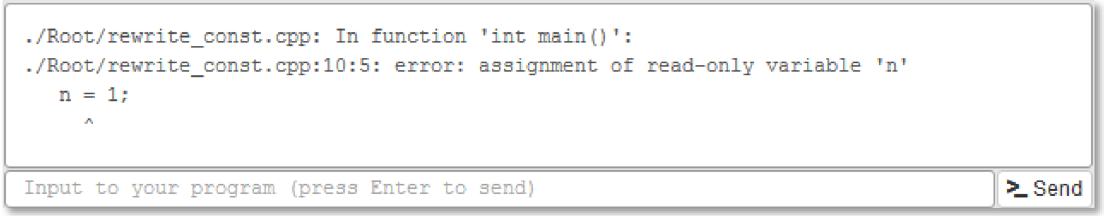
- Protects against unintended changes
  - Compiler error message



```
./Root/rewrite_const.cpp: In function 'int main()':
./Root/rewrite_const.cpp:10:5: error: assignment of read-only variable 'n'
   n = 1;
     ^
```

`const` – Necessary?

- Protects against unintended changes
  - Compiler error message



```
./Root/rewrite_const.cpp: In function 'int main()':
./Root/rewrite_const.cpp:10:5: error: assignment of read-only variable 'n'
   n = 1;
     ^
```

- Communicate to reader
  - Reader knows: value will not change

Exercise

Make this `const`-correct.

1. Program:

```
#include <iostream>
int main ()
{
    const int a = 5;
    std::cin >> a;
    std::cout << a + 5;

    return 0;
}
```

(From: Script Exercise 5)

Exercise

Problem:

input operator >> changes constant variable

1. Program:

```
#include <iostream>
int main ()
{
    const int a = 5;
    std::cin >> a;
    std::cout << a + 5;

    return 0;
}
```

→

Solution:

```
#include <iostream>
int main ()
{
    int a = 5;
    std::cin >> a;
    std::cout << a + 5;

    return 0;
}
```

(From: Script Exercise 5)

Exercise

Make this `const`-correct.

2. Program:

```
int main ()
{
    const int a = 5;
    int b = 2*a;
    int c = 2*b;
    b = b*b;

    return 0;
}
```

(From: Script Exercise 5)

Exercise

Problem:

- c should be const.
- c is initialized without a later use.

2. Program:

```
int main ()
{
    const int a = 5;
    int b = 2*a;
    int c = 2*b;
    b = b*b;

    return 0;
}
```

Solution:

```
int main ()
{
    const int a = 5;
    int b = 2*a;
    const int c = 2*b;
    b = b*b;

    return 0;
}
```

(From: Script Exercise 5)

Exercise

Make this `const`-correct.

3. Program:

```
int main ()
{
    const int a = 5;
    a = 5;

    return 0;
}
```

(From: Script Exercise 5)

Exercise

Problem:

`a = 5;` overwrites `a` with **same** value.
But `a` is `const`; `const` prevails.

3. Program:

```
int main ()
{
    const int a = 5;
    a = 5;

    return 0;
}
```

Solution:

Remove `const` or
`a = 5;`

(From: Script Exercise 5)