Using Objects

string

- `string` is a class in C++
- You must add this at the beginning of your code:

  `#include <string>`

- Define variable of string like other types:

  `string str;`

- Initialize it w/ string literal:

  `string str = "Hello";`

  `string str("Hello");`

  `string str{"Hello"};`

Object

- A `string` variable is an object.

> Everything is an object.
>
> by Alan Kay

- A variable of any type in C++ is an object.

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Assignment for string

```cpp
char charr1[20];
char charr2[20] = "jaguar";
string str1;
string str2 = "panther";
carr1 = char2;   // illegal
str1 = str2;     // legal
```

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Input and Output

- Read and write string with `cin` / `cout` :

```
cin >> str;
cout << str;
```

- Read a whole line:

```
getline(cin, line_var)
```

One character in a string

- A string can be used as an array:

```
string s = "Hello";
s[0]='J';
```

Concatenation for string

```
string str3;
str3 = str1 + str2;
str1 += str2;
str1 += "lalala";
```

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length

```
s.length();
```

- The dot `.` is an operator that retrieve a member of a struct in C

- It is still that operator in C++ that retrieve a member of an object in C

Create a string

```
string(const char *cp, int len);
string(const string& s2, int pos);
string(const string& s2, int pos, int len);
```

Sub-string

```
substr(int pos, int len);
```

Alter string

```
insert(size_t pos, const string& s);
erase (size_t pos = 0, size_t len = npos);
append (const string& str);
replace (size_t pos,  size_t len,  const string& str);
```

Search string

```
size_t find (const string& str, size_t pos = 0) const;
```

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Pointers to Objects

```cpp
string s = "hello";
string* ps = &s;
```

Operators with Pointers

- `&` : get address

- `ps = &s;`

- `*` : get the object
  - `(*ps).length()`

- `->` : call the function
  - `ps->length()`

Two Ways to Access

- `string s;`
  - `s` is the object itself

- `string *ps;`
  - `ps` is a pointer to an object

Object vs Pointer

- `string s;`
  - At this line, object `s` is created and initialized

- `string *ps;`
  - At this line, the object `ps` points to is not known yet

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Assignment

```
string s1, s2;
s1 = s2;
string *ps1, *ps2;
ps1 = ps2;
```

What we've learned today?

- A brief history of C++

- Input and output in C++ with `cin` and `cout` (Ch1.2)

- The `string` class, the dot `.` operator (Ch3.2)

- Pointer to an object, the arrow `->` operator