Step-by-step walkthrough for example on page 47 of the lecture notes:
Object Initialization, Construction and Destruction

```cpp
#include <cstring> /* File: default-assign-bug.cpp */
class Word
{
  private:
    int frequency; char* str;
  public:
    Word() : frequency(0), str(nullptr) { }
    Word(const char* s, int k = 0): frequency(k)
        { str = new char [strlen(s)+1]; strcpy(str, s); }
    ~Word() { delete [] str; }
};

void Bug(Word& x) { Word bug("bug", 4); x = bug; }

int main() { Word movie("Titanic"); Bug(movie); return 0; }
```
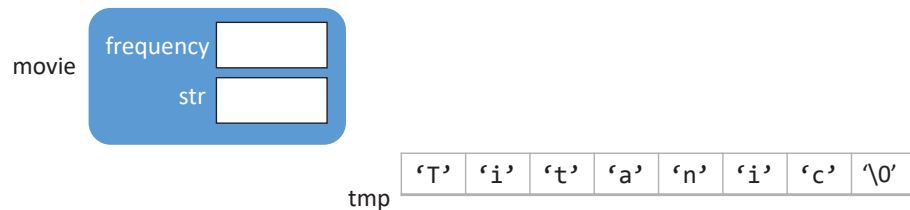

```cpp
#include <cstring> /* File: default-assign-bug.cpp */
class Word
{
  private:
    int frequency; char* str;
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    Word() : frequency(0), str(nullptr) { }
    Word(const char* s, int k = 0): frequency(k)
        { str = new char [strlen(s)+1]; strcpy(str, s); }
    ~Word() { delete [] str; }
};

void Bug(Word& x) { Word bug("bug", 4); x = bug; }

int main() { Word movie("Titanic"); Bug(movie); return 0; }
```

movie

frequency	
str	

'T'	'i'	't'	'a'	'n'	'i'	'c'	'\0'

tmp

```cpp
#include <cstring> /* File: default-assign-bug.cpp */
class Word
{
  private:
    int frequency; char* str;
  public:
    Word() : frequency(0), str(nullptr) { }
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void Bug(Word& x) { Word bug("bug", 4); x = bug; }

int main() { Word movie("Titanic"); Bug(movie); return 0; }
```
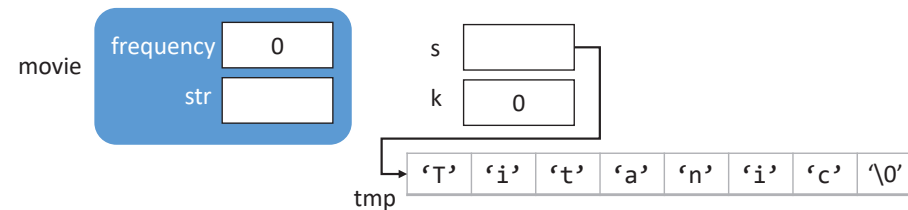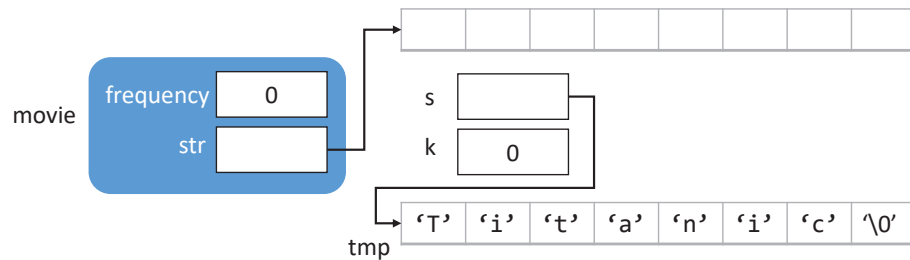
movie

frequency	0
str	

s

k

	0

'T'	'i'	't'	'a'	'n'	'i'	'c'	'\0'

tmp

Top-left quadrant:

```cpp
#include <cstring> /* File: default-assign-bug.cpp */
class Word
{
  private:
    int frequency; char* str;
  public:
    Word() : frequency(0), str(nullptr) { }
    Word(const char* s, int k = 0): frequency(k)
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void Bug(Word& x) { Word bug("bug", 4); x = bug; }

int main() { Word movie("Titanic"); Bug(movie); return 0; }
```
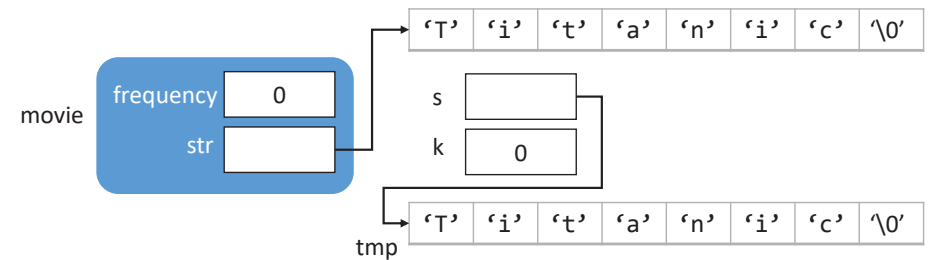
movie — frequency 0, str

s, k 0

tmp: 'T' 'i' 't' 'a' 'n' 'i' 'c' '\0'

Top-right quadrant:

```cpp
#include <cstring> /* File: default-assign-bug.cpp */
class Word
{
  private:
    int frequency; char* str;
  public:
    Word() : frequency(0), str(nullptr) { }
    Word(const char* s, int k = 0): frequency(k)
        { str = new char [strlen(s)+1]; strcpy(str, s); }
    ~Word() { delete [] str; }
};

void Bug(Word& x) { Word bug("bug", 4); x = bug; }

int main() { Word movie("Titanic"); Bug(movie); return 0; }
```
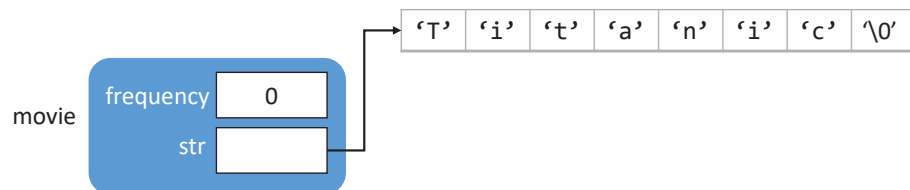
'T' 'i' 't' 'a' 'n' 'i' 'c' '\0'

movie — frequency 0, str

s, k 0

tmp: 'T' 'i' 't' 'a' 'n' 'i' 'c' '\0'

Bottom-left quadrant:

```cpp
#include <cstring> /* File: default-assign-bug.cpp */
class Word
{
  private:
    int frequency; char* str;
  public:
    Word() : frequency(0), str(nullptr) { }
    Word(const char* s, int k = 0): frequency(k)
        { str = new char [strlen(s)+1]; strcpy(str, s); }
    ~Word() { delete [] str; }
};

void Bug(Word& x) { Word bug("bug", 4); x = bug; }

int main() { Word movie("Titanic"); Bug(movie); return 0; }
```
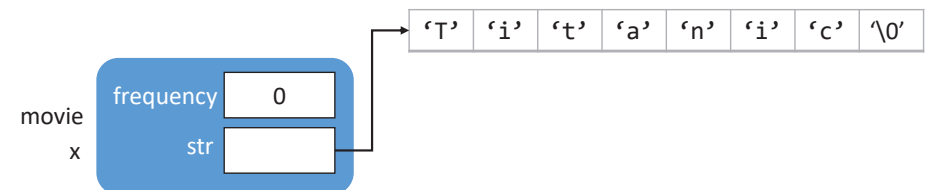
'T' 'i' 't' 'a' 'n' 'i' 'c' '\0'

movie — frequency 0, str

Bottom-right quadrant:

```cpp
#include <cstring> /* File: default-assign-bug.cpp */
class Word
{
  private:
    int frequency; char* str;
  public:
    Word() : frequency(0), str(nullptr) { }
    Word(const char* s, int k = 0): frequency(k)
        { str = new char [strlen(s)+1]; strcpy(str, s); }
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};

void Bug(Word& x) { Word bug("bug", 4); x = bug; }

int main() { Word movie("Titanic"); Bug(movie); return 0; }
```

'T' 'i' 't' 'a' 'n' 'i' 'c' '\0'

movie, x — frequency 0, str

Top-left panel

```cpp
#include <cstring> /* File: default-assign-bug.cpp */
class Word
{
  private:
    int frequency; char* str;
  public:
    Word() : frequency(0), str(nullptr) { }
    Word(const char* s, int k = 0): frequency(k)
        { str = new char [strlen(s)+1]; strcpy(str, s); }
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};

void Bug(Word& x) { Word bug("bug", 4); x = bug; }

int main() { Word movie("Titanic"); Bug(movie); return 0; }
```
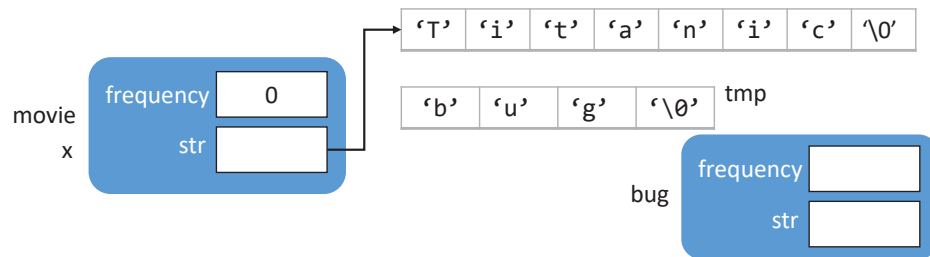
'T' 'i' 't' 'a' 'n' 'i' 'c' '\0'

'b' 'u' 'g' '\0' tmp

movie
x — frequency 0, str

bug — frequency, str

Top-right panel

```cpp
#include <cstring> /* File: default-assign-bug.cpp */
class Word
{
  private:
    int frequency; char* str;
  public:
    Word() : frequency(0), str(nullptr) { }
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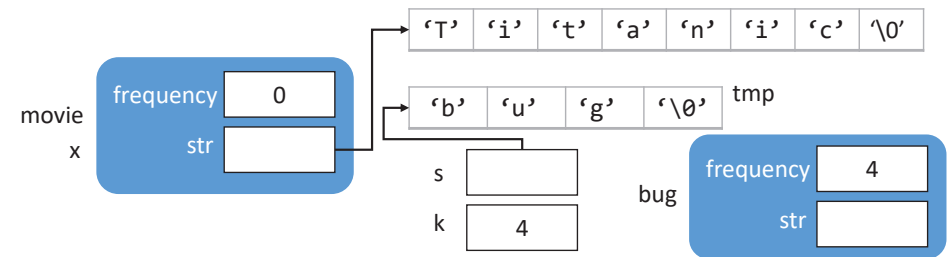
'T' 'i' 't' 'a' 'n' 'i' 'c' '\0'

'b' 'u' 'g' '\0' tmp

movie
x — frequency 0, str

s
k 4

bug — frequency 4, str

Bottom-left panel

```cpp
#include <cstring> /* File: default-assign-bug.cpp */
class Word
{
  private:
    int frequency; char* str;
  public:
    Word() : frequency(0), str(nullptr) { }
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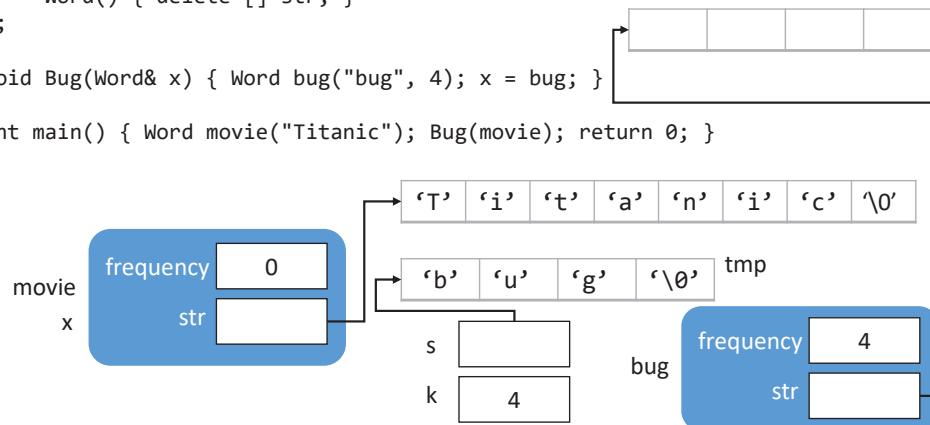
'T' 'i' 't' 'a' 'n' 'i' 'c' '\0'

'b' 'u' 'g' '\0' tmp

movie
x — frequency 0, str

s
k 4

bug — frequency 4, str

Bottom-right panel

```cpp
#include <cstring> /* File: default-assign-bug.cpp */
class Word
{
  private:
    int frequency; char* str;
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    Word() : frequency(0), str(nullptr) { }
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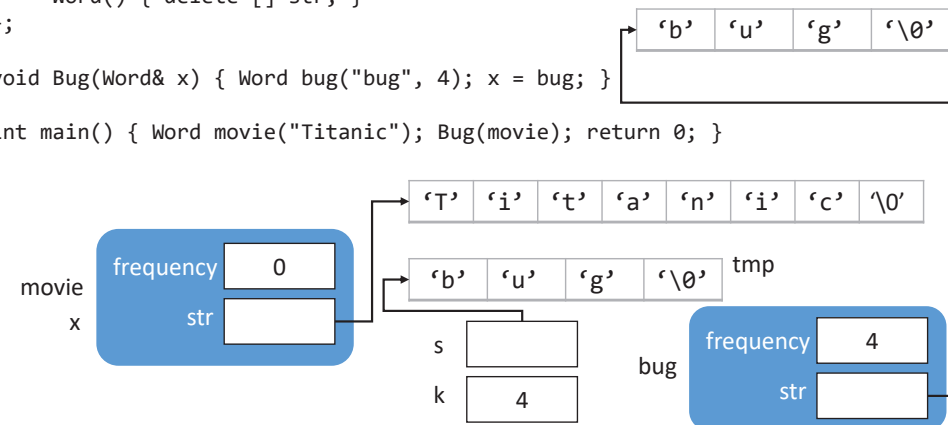
'b' 'u' 'g' '\0'

'T' 'i' 't' 'a' 'n' 'i' 'c' '\0'

'b' 'u' 'g' '\0' tmp

movie
x — frequency 0, str

s
k 4

bug — frequency 4, str

Top-left panel:
```cpp
#include <cstring> /* File: default-assign-bug.cpp */
class Word
{
  private:
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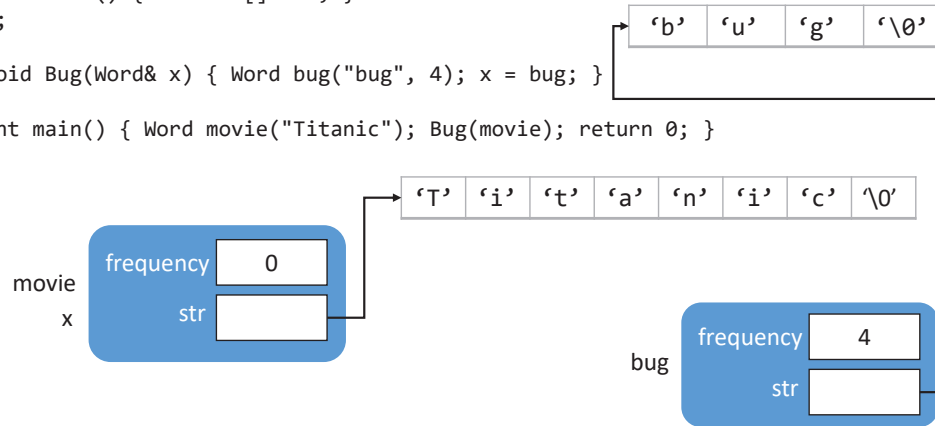
'b' 'u' 'g' '\0'

'T' 'i' 't' 'a' 'n' 'i' 'c' '\0'

movie
x   frequency 0
     str

bug frequency 4
     str

Top-right panel:
```cpp
#include <cstring> /* File: default-assign-bug.cpp */
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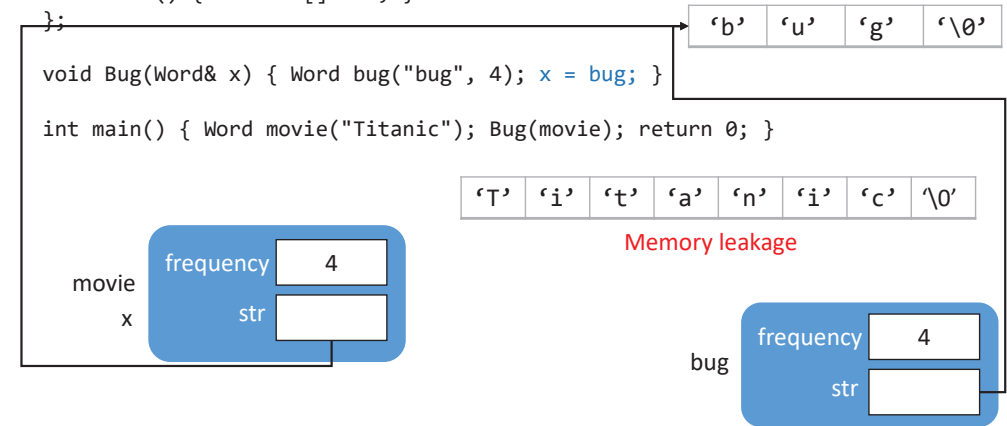
'b' 'u' 'g' '\0'

'T' 'i' 't' 'a' 'n' 'i' 'c' '\0'
Memory leakage

movie
x   frequency 4
     str

bug frequency 4
     str

Bottom-left panel:
```cpp
#include <cstring> /* File: default-assign-bug.cpp */
class Word
{
  private:
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    Word() : frequency(0), str(nullptr) { }
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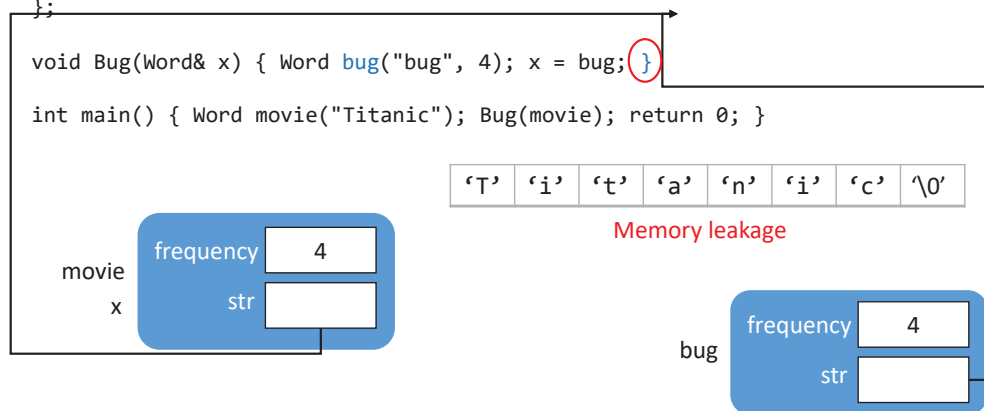
'T' 'i' 't' 'a' 'n' 'i' 'c' '\0'
Memory leakage

movie
x   frequency 4
     str

bug frequency 4
     str

Bottom-right panel:
```cpp
#include <cstring> /* File: default-assign-bug.cpp */
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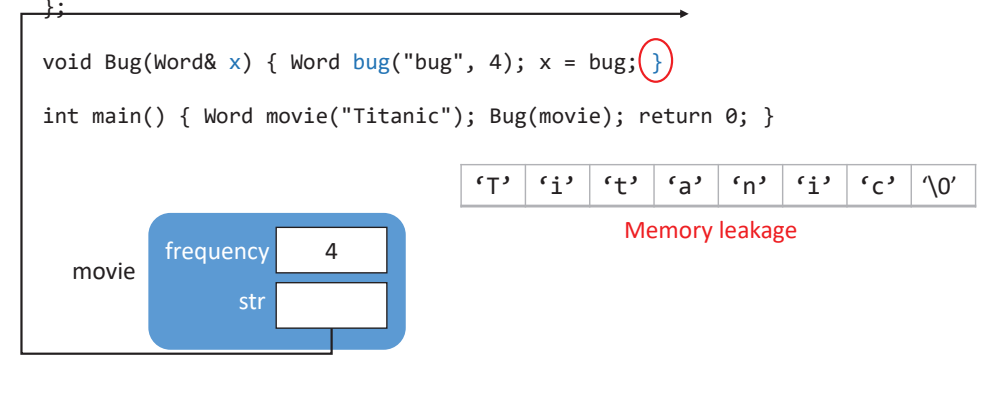
'T' 'i' 't' 'a' 'n' 'i' 'c' '\0'
Memory leakage

movie
     frequency 4
     str

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```

Runtime error!

| 'T' | 'i' | 't' | 'a' | 'n' | 'i' | 'c' | '\0' |

Memory leakage

movie

| frequency | 4 |
| str | |