Step-by-step walkthrough for example on page 42 of the lecture notes:

Object Initialization,

Construction and Destruction

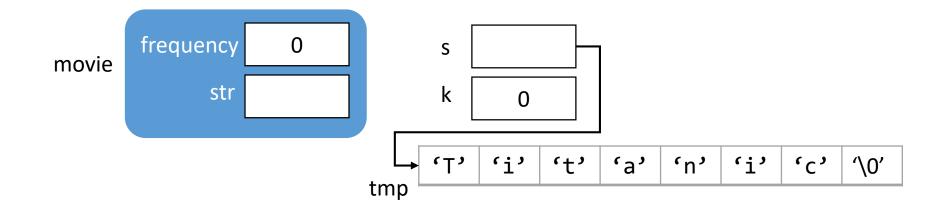
```
#include <cstring> /* File: default-assign-bug.cpp */
class Word
  private:
    int frequency; char* str;
  public:
    Word() : frequency(0), str(nullptr) { }
    Word(const char* s, int k = 0): frequency(k)
        { str = new char [strlen(s)+1]; strcpy(str, s); }
    ~Word() { delete [] str; }
};
void Bug(Word& x) { Word bug("bug", 4); x = bug; }
int main() { Word movie("Titanic"); Bug(movie); return 0; }
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```

movie frequency str

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

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void Bug(Word& x) { Word bug("bug", 4); x = bug; }
int main() { Word movie("Titanic"); Bug(movie); return 0; }
          frequency
                       0
                                     S
  movie
                str
                                     k
                                            0
                                    (T)
                                         (i)
                                               ٠+ ٢
                                                    'a'
                                                          'n,
                                                               'i'
                                                                          '\0'
```

tmp

```
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                                          (i)
                                                                'i'
                                     'T'
                                               '+'
                                                     'a'
                                                          'n,
                                                                          '\0'
          frequency
                        0
                                     S
  movie
                str
                                     k
                                            0
                                     (T)
                                          'i'
                                               ٠+,
                                                     'a'
                                                          'n,
                                                                'i'
                                                                          '\0'
```

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void Bug(Word& x) { Word bug("bug", 4); x = bug; }
int main() { Word movie("Titanic"); Bug(movie); return 0; }
                                              '†'
                                                    'a'
                                                         'n,
                                                                         '\0'
          frequency
                       0
  movie
                str
```

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                                         (i)
                                              ٠+،
                                                    'a'
                                                         'n,
                                                              'i'
                                                                         '\0'
          frequency
                       0
  movie
                str
      Χ
```

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                                          (i)
                                               ٠+،
                                    'T'
                                                     'a'
                                                          'n,
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          frequency
                       0
                                                              tmp
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                                     'b'
                                                        '\0'
                                           رں،
  movie
                str
      Χ
                                                            frequency
                                                       bug
                                                                  str
```

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                                          (i)
                                               ٠+،
                                     'T'
                                                     'a'
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                                                                (i)
                                                                          '\0'
          frequency
                       0
                                                               tmp
                                                  'g'
                                     'b'
                                           'u'
                                                        10'
  movie
                str
      Χ
                                                            frequency
                                                                          4
                                     S
                                                       bug
                                                                   str
                                     k
                                            4
```

```
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                                          (i)
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                                                          'n,
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          frequency
                        0
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                                                  'g'
                                     'b'
                                           'u'
                                                        10'
  movie
                str
      Χ
                                                             frequency
                                                                          4
                                     S
                                                       bug
                                                                   str
                                     k
                                            4
```

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};
                                                                     'g'
                                                         b,
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void Bug(Word& x) { Word bug("bug", 4); x = bug; }
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          frequency
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                                                  'g'
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                                                         10'
  movie
                str
      Χ
                                                             frequency
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                                     S
                                                       bug
                                                                   str
                                     k
                                            4
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};
                                                                     'g'
                                                        b,
                                                              'u'
                                                                           (\0,
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                                                          'n'
                                                               'i'
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                                                    'a'
                                                                          '\0'
          frequency
                       0
  movie
                str
      Χ
                                                            frequency
                                                      bug
                                                                  str
```

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                                                                    'g'
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                                                                         '\0'
                                                Memory leakage
          frequency
  movie
                str
      Χ
                                                            frequency
                                                                         4
                                                      bug
                                                                  str
```

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                                                Memory leakage
          frequency
  movie
                str
      Χ
                                                           frequency
                                                      bug
                                                                  str
```

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                                    (T)
                                                   'a'
                                                        'n
                                                              'i'
                                                                        '\0'
                                                Memory leakage
          frequency
  movie
```

str

```
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                                                               Runtime error!
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                                         (i)
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                                              ۲,
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                                                                    ری
                                                                         '\0'
                                                Memory leakage
          frequency
  movie
                str
```