Step-by-step walkthrough for example on page 13 of the lecture notes:

Object Initialization,

Construction and Destruction

```
#include <iostream>
                              /* File: implicit-conversion-surprise.cpp */
#include <cstring>
using namespace std;
class Word {
  private:
    int frequency; char* str;
  public:
    Word(char c) {
      frequency = 1; str = new char[2]; str[0] = c; str[1] = '\0';
      cout << "call implicit char conversion\n";</pre>
    Word(const char* s) {
      frequency = 1; str = new char [strlen(s)+1]; strcpy(str, s);
      cout << "call implicit const char* conversion\n";</pre>
    void print() const { cout << str << " : " << frequency << endl; }</pre>
};
void print word(Word x) { x.print(); }
int main() { print word("Titanic"); print word('A'); return 0; }
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'T' 'i' 't' 'a' 'n' 'i' 'c' '\0'

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        frequency
temp
                                                'i'
                                                     't'
                                                               'n'
                                                                     'i'
                                                                          'c'
                                                                              '\0'
                           S
              str
                                       tmp
```

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                                                'i'
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                                                 'i'
                                                                      'i'
                                            'T'
                                                      't'
                                                                'n'
                                                                           'c'
                                                                                '\0'
        frequency
                    1
temp
                                                 'i'
                                                      '†'
                                                                      'i'
                            S
                                                                'n'
                                                                           'c'
                                                                                '\0'
               str
                                        tmp
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                                                 'i'
                                                                      'i'
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                                            'T'
                                                      't'
                                                                'n'
                                                                               '\0'
        frequency
                    1
temp
                                                 'i'
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                                                                      'i'
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                                                'i'
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                                                     't'
                                                               'n'
                                                                              '\0'
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                    1
temp
                                                'i'
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#include <iostream>
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                                Output:
using namespace std;
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class Word {
                                                           Χ
  private:
                                                                 frequency
    int frequency; char* str;
  public:
                                                                       str
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                                                 'i'
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                                                                               '\0'
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  private:
                                                                frequency
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                                                                       str
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                                           'T'
                                                'i'
                                                                     'i'
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                                                     't'
                                                               'n'
                                                                              '\0'
 Χ
      frequency
                   1
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'T' 'i' 't' 'a' 'n' 'i' 'c' '\0'

Memory leak

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c 'A'

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

Memory leak

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                     frequency
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                                                'i'
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                                                'A'
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                                                'i'
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                                                               'n'
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                                                                               1
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                                                 'A'
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using namespace std;
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                                                                                  Χ
class Word {
                                Titanic: 1
  private:
                                                                  frequency
                                                                               1
                                call implicit char conversion
    int frequency; char* str;
  public:
                                                                         str
    Word(char c) {
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                                                                     'i'
                                                                          'c'
                                                                               '\0'
                     requency
            temp
                                                        Memory leak
                                                'A'
                                                     '\0'
```

```
/* File: implicit-conversion-surprise.cpp */
#include <iostream>
#include <cstring>
                               Output:
using namespace std;
                                call implicit const char* conversion
                                                                                  Х
class Word {
                                Titanic: 1
  private:
                                                                 frequency
                                                                              1
                                call implicit char conversion
    int frequency; char* str;
  public:
                                                                        str
    Word(char c) {
      frequency = 1; str = new char[2]; str[0] = c; str[1] = '\0';
      cout << "call implicit char conversion\n";</pre>
    Word(const char* s) {
      frequency = 1; str = new char [strlen(s)+1]; strcpy(str, s);
      cout << "call implicit const char* conversion\n";</pre>
    void print() const { cout << str << " : " << frequency << endl; }</pre>
};
void print word(Word x) { x.print(); }
int main() { print word("Titanic"); print word('A'); return 0; }
                                                'i'
                                                                     'i'
                                                                         'c'
                                           'T'
                                                     't'
                                                               'n'
                                                                              '\0'
                                                        Memory leak
                                                'A'
                                                     '\0'
```

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  private:
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                                                                              1
                               call implicit char conversion
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                               A 1
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                                                'i'
                                                                     'i'
                                                                         'c'
                                           'T'
                                                     't'
                                                               'n'
                                                                              '\0'
                                                        Memory leak
                                                'A'
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                                                'i'
                                                                    'i'
                                                                         'c'
                                           'T'
                                                     't'
                                                               'n'
                                                                              '\0'
                                                        Memory leak
                                                'A'
                                                    '\0'
```

```
#include <iostream>
                               /* File: implicit-conversion-surprise.cpp */
#include <cstring>
                               Output:
using namespace std;
                               call implicit const char* conversion
class Word {
                               Titanic: 1
  private:
                               call implicit char conversion
    int frequency; char* str;
                               A 1
  public:
    Word(char c) {
      frequency = 1; str = new char[2]; str[0] = c; str[1] = '\0';
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                                                'i'
                                                                    'i'
                                           'T'
                                                     't'
                                                               'n'
                                                                         'c'
                                                                              '\0'
```

Memory leak

'A' | '\0' | Memory leak