Haiku, Hip-Hop and the Heap

Teaching deep copy vs. shallow copy, using a Japanese Poetry form and Rap Lyrics.

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A story...

The bug that wrecked the party!
Online Party Invitation System

Create New Event

(1) What would you like to call your event?

Bob's Birthday Party

(Enter something like "Fred's Super Bowl Bash")

(2) How would you like to create a guest list?

Start from scratch

Start with an existing list, then make changes

(3) Choose existing list to start from

Jacob's Graduation Party
Jacob's Graduation Party
Hannah's Birthday Party
Bob's Super Bowl Blowout
Editing the guest list

You chose to start with the guest list from Jacob's Graduation Party.

Delete any guests that are not invited to Bob's Birthday Party.

Add additional guests from your friends list that are invited to Bob's Birthday Party.
But something goes wrong...

- Bob makes a copy of "Jacob's Graduation Party"
  - Deletes some folks
  - Adds some folks
  - It's all good for Bob
- But, Jacob gets a bad surprise
  - Some of his friends never get the invite to his party
  - Some folks he doesn't even know show up!

What happened?
what should happen...

```java
newEvent = new Event(oldEvent); // create copy of old event
newEvent.setName(newEventName);
```
what might happen instead...

newEvent = new Event(oldEvent); // create copy of old event
newEvent.setName(newEventName);
A Haiku:
Shallow versus Deep
Two kinds of object copy
Understand this point!

Understand this point!
Two kinds of object copy
Shallow versus Deep

Jacob's Graduation Party
Bob, Jacob, Paula, Kim, Seth

Bob's Birthday Party
Bob, Jacob, Kim, Seth, Paula
Shallow versus Deep
Default Memberwise Copy
is the shallow kind

null
Pointer Attributes?
Write a Copy Constructor!
Make your copy deep!
Pointer Attributes?
Shallow Copy leaves objects attached at the heap
The Big-Three in C++

class Event
{
    public:
    ...
    Event(const Event &orig);
    Event & operator=(const Event &right);
    ~Event();
    ...
};

If your attributes are pointers
then listen to your instructor
you gotta implement the copy constructor
overload the equals sign
and write a destructor
if you wanna code like a 1337