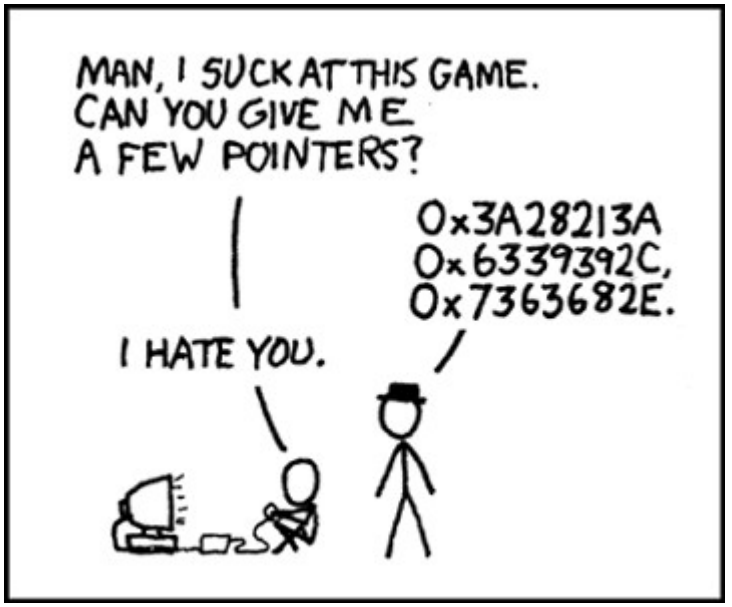
C++ Pointers

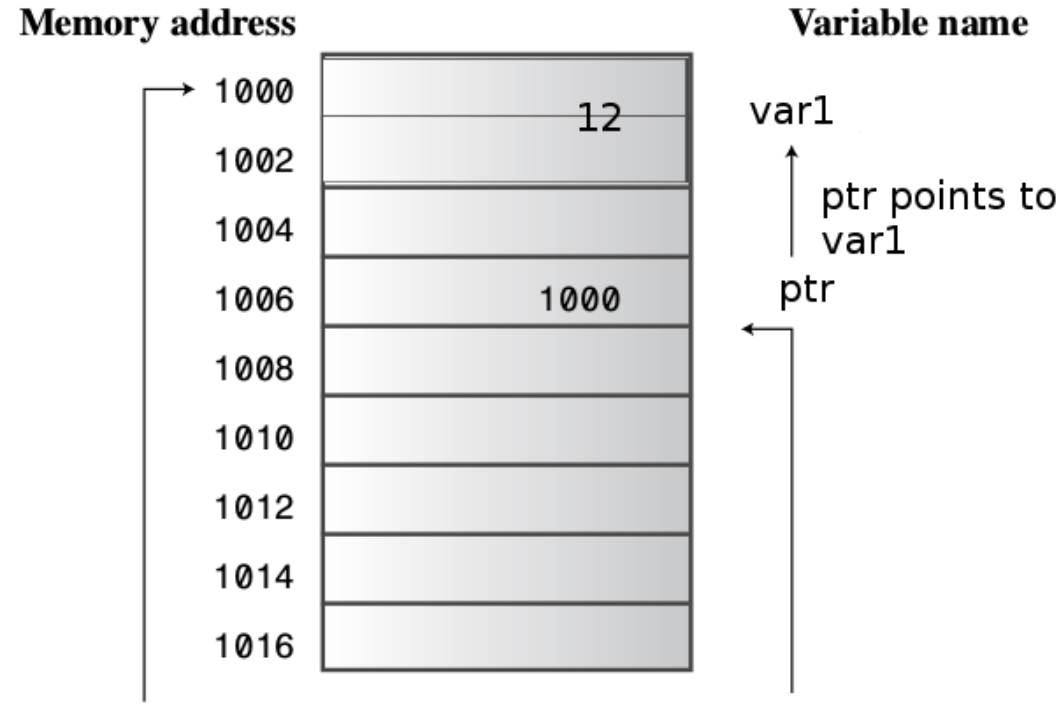


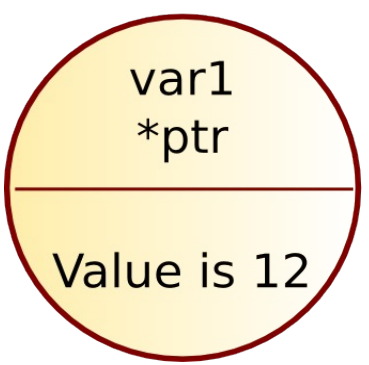
Krishna Kumar

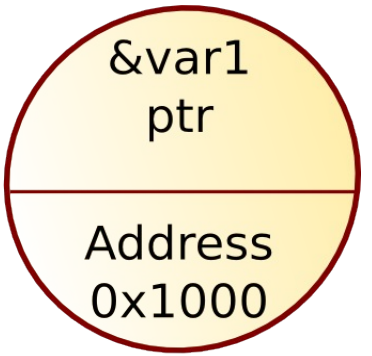
Every computer, at the unreachable memory address 0x-1, stores a secret. I found it, and it is that all humans ar-- SEGMENTATION FAULT
XKCD (https://xkcd.com/138/)

Pointer

- Pointer values are memory addresses
  - A pointer **p** can hold the address of a memory location
  - A pointer points to an object of a given type
    - E.g. a int* points to an int, not to a string







Pointer to

```
char* cptr;                 // Pointer to a char
int* iptr;                  // Pointer to an int
float* fptr;                // Pointer to a float
MyClass* myclasspt;         //  Pointer to a user-defined class MyClass
int* ap[15];                // array of 15 pointers to ints
int (*fp)(char*);           // pointer to function taking a char*
                            // argument; returns an int
int* f(char*);              // function taking a char* argument; returns a
                            // pointer to int
```

Pointer Danger

```
int* ptr;      // create a pointer-to-int
*ptr = 556; // place a value in never-never land
```

- **Pointer Golden Rule:** Always initialize a pointer to a definite an appropriate address before you apply the dereferencing operator (*) to it

Capsule Summary

```
int v;                  //defines variable v of type int
int* p = &v;            //defines p as a pointer to int
                        //assigns address of variable v to
                        // pointer p
v = 3;                  //assigns 3 to v
*p = 3;                 //also assigns 3 to v
```