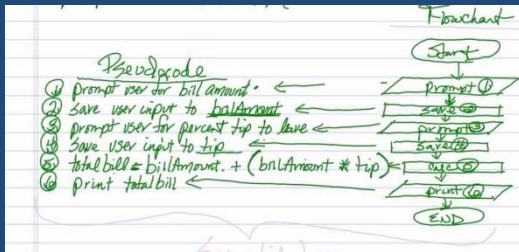
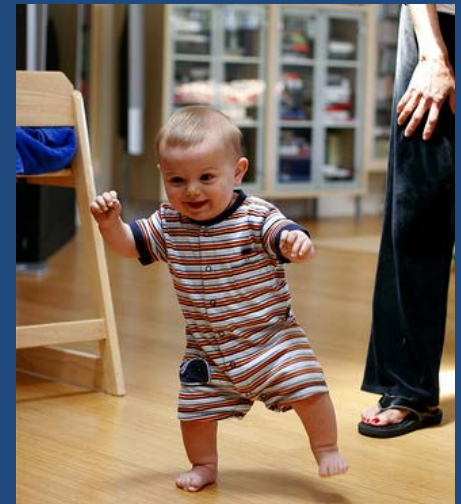


C Programming

Design Example



Example of Pseudocode and Baby Steps, Live!



“Write a program that will ask the user for a number then display a box of asterisks whose height and width is the number entered. Exit when the user enters 0.”



You can use getNum():

```
int getNum(void)
{
    /* the array is 121 bytes in size; we'll see in a later lecture how we can improve this code */
    char record[121] = {0};          /* record stores the string */
    int number = 0;

    /* NOTE to student: indent and brace this function consistent with your others */
    /* use fgets() to get a string from the keyboard */
    fgets(record, 121, stdin);

    /* extract the number from the string; sscanf() returns a number
     * corresponding with the number of items it found in the string */
    if( sscanf(record, "%d", &number) != 1 )
    {
        /* if the user did not enter a number recognizable by
         * the system, set number to -1 */
        number = -1;
    }

    return number;
}
```

Let's see
Pseudocode
and
Baby Steps ...



Things to Note: Pseudocode

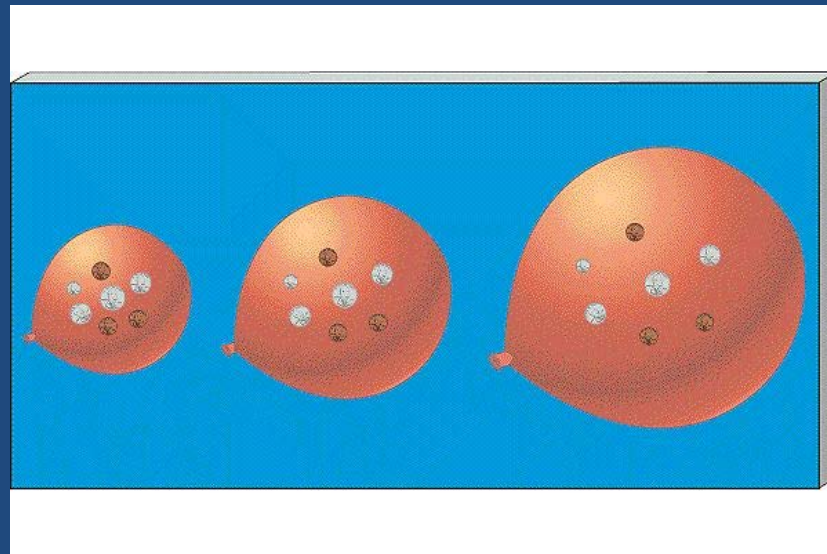


Your
pseudocode
likely won't be
perfect
(it'll get you
close)

Using line
numbers
in pseudocode
can be useful
or not
(it's up to you)



Each pseudocode line
should usually expand
to no more than
4 or 5 lines



Similar pieces of
code
will become
evident when
doing
pseudocode



Don't worry about
declaring variables
in pseudocode
(you can do that
later)



Commenting
happens
naturally
with pseudocode

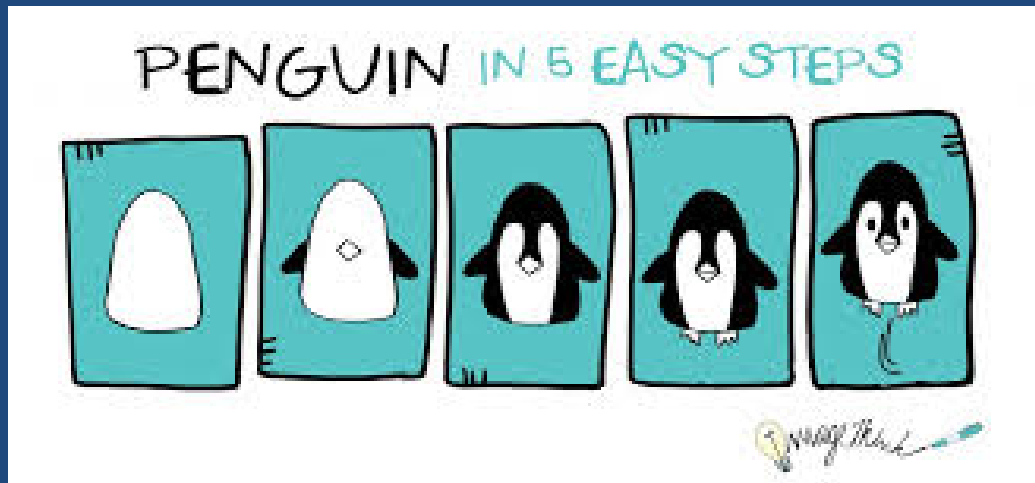


Things to Note: Baby Steps

Start at the
most comfortable
level



Take
many
easy steps



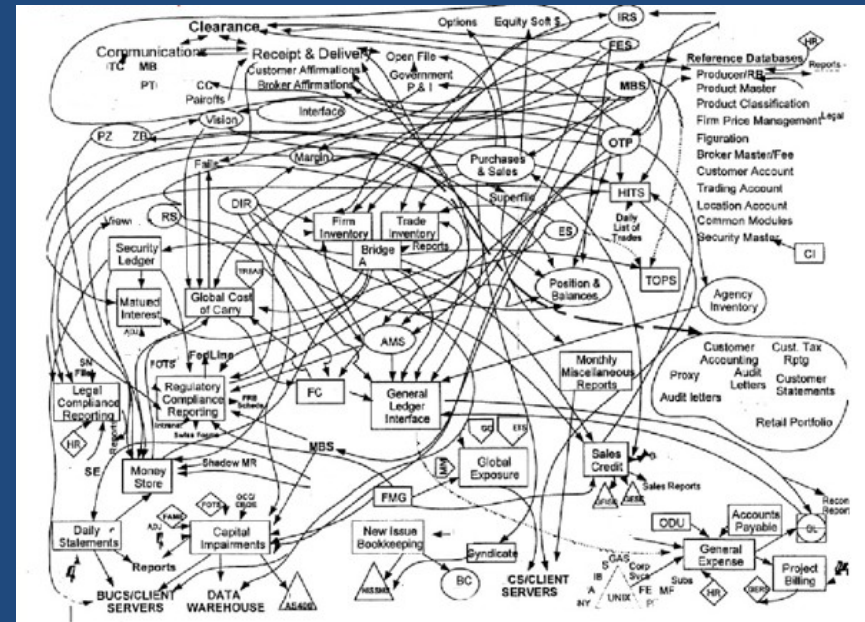
There's nothing wrong
with doing
something
and then
undoing it
if it gets you closer



Change
your variable
names
if needed



Don't be afraid
to write
inefficient code
when you're
learning
(that'll come later)



Common Solution Hints

Always give
your variables
values
when you
declare them



If you have
a loop
that uses
a counter,
increase it



e.g.:

```
while( i < number )
```

```
{
```

```
    // stuff goes here
```

```
    ++i;
```

```
}
```

Loop inside loop?
Reset your
counter values
before the inner
loop starts



e.g.

```
while( numberOfLines < numberOfAsterisks )
{
    // stuff goes here
    i = 0;
    while( i < numberOfAsterisks )
    {
        // stuff goes here
        ++i;
    }
    // stuff goes here
}
```

Using
getNum()?
Copy-and-paste
the code.

(For now, put that code
before main())



Lastly ...

Note that the
ultimate solution
was different
for the two
design methods



Another Design Exercise For You

“A subway has three fee classifications: student (0 to 17), adult, senior (65 and over). Write a program that takes riders’ ages from the user repeatedly. Quit taking user input when they enter -1 for the age. Before exiting the program, display the total riders for each category.”



Another Design Exercise For You

“Write a program that takes 10 numbers in from the user and prints the maximum, minimum, and average upon exiting.”



Summary

Design can take a while ...
but it's worth it!