COMP 1010- Summer 2015 (A01)

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Another example…

Let’s make a program with squares moving randomly around the screen – bad guys!

1 bad guy:

Global variables

finals: max move size (20), bg color

bad guy color,

others: size, x and y

Make random moves

Separate x and y

- can move left or right by max move
- so range of movement is –max…max
- If 20, then 40 possible positions (41?)
- how to generate this as a random number?
    - random(2*max)-max -> -max...max

See the repetition? Hmm.

Make sure doesn’t move off the edges of the screen

Use ifs, or min and max

Draw the badguy – set the stroke and fill colors, too

Scale to three bad guys!!!

What a mess…

Use functions to simplify and reduce repeated code

New function!

drawBadGuy(x, y, size, color);

Draw block is now a little simpler… but still a lot of code being repeated..

Can we make a command like..

moveBadGuy(x, y)

moveBadGuy(badGuy1X, badGuy1Y)

No – since data is only copied in, any changes that happen in that function are not reflected back in our variables. It is thrown away.

What functions give us data back? What do they look like?

max, min, random…

```
int result = max(10,4);
```

Functions can only return one piece of data

They can give you an integer,

A float

A String

Etc.

Send data back from a function:

let's make a function myMax(int a, int b) which gives us an integer to represent the largest of the two:

int bigger = myMax(5, 2); // expect 5 to be the answer

first – let's implement this using the tools we already have

we can calculate important information – but how do we send it back?

Send data back from a function:

returnType functionName (**parameterType parameterName**)

```
int myMax(int a, int b)
{
  int result = a;
  if (b>a)
          result = b;
  return result;
}
```

the **return** command does two things:

- it ends the function and returns to where it was called from
- it passes data along from the function to the caller

be careful! the types have to match- the return type of the method, and, the data you are returning.

user-defined functions: syntax

```
int myMax(int a, int b) {
  int result = a;
  if (b>a)
        result = b;
  return result;
}


...
int max = myMax(10,20);
```

these are “local variables”, only exists within the function. this name is not related to how you can use the function

user-defined functions: syntax

```
int myMax(int a, int b) {
  int result = a;
  if (b>a)
        result = b;
  return result;
}


…
int max = myMax(10,20);
```

Exercise:

Make a function to calculate the distance between two points.

another XKCD comic

remember random()??

how would you implement your own? tough..