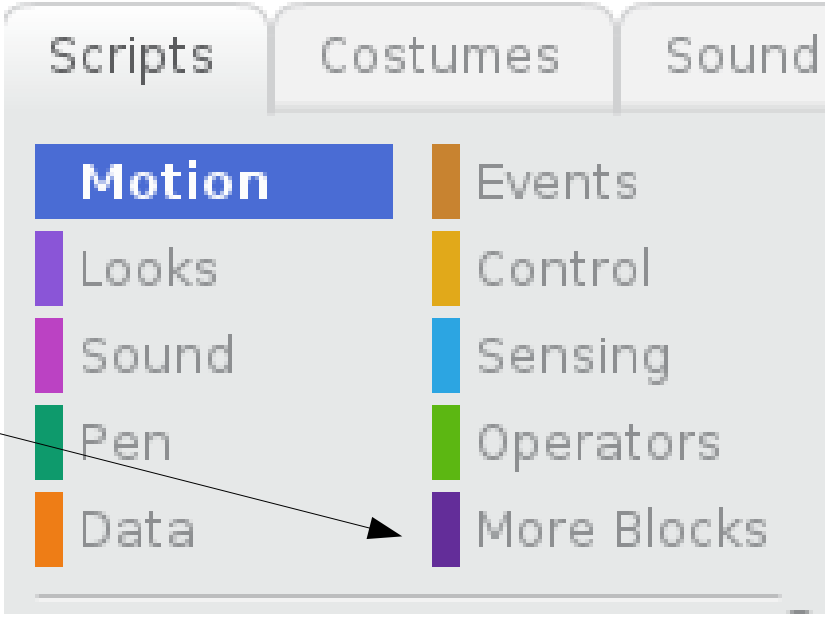
Week 1; Lecture 3

Functions

New Blocks

- Functions are called New Blocks in Scratch
  - New Blocks
- Allows you to create your own blocks
  - Two steps
    - Define what the new block does
    - Use the new block



New Blocks

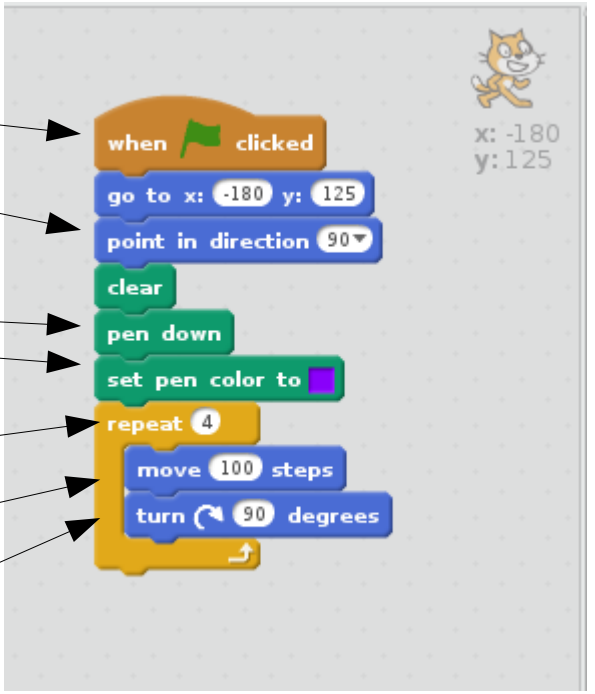
- We can make writing programs in Scratch much easier by defining new blocks.
- We define a new block by writing a program that is executed each time it is called.
  - **Define**: write a program associated with a block name
  - **Call**: include the newly defined block in a program

Functions

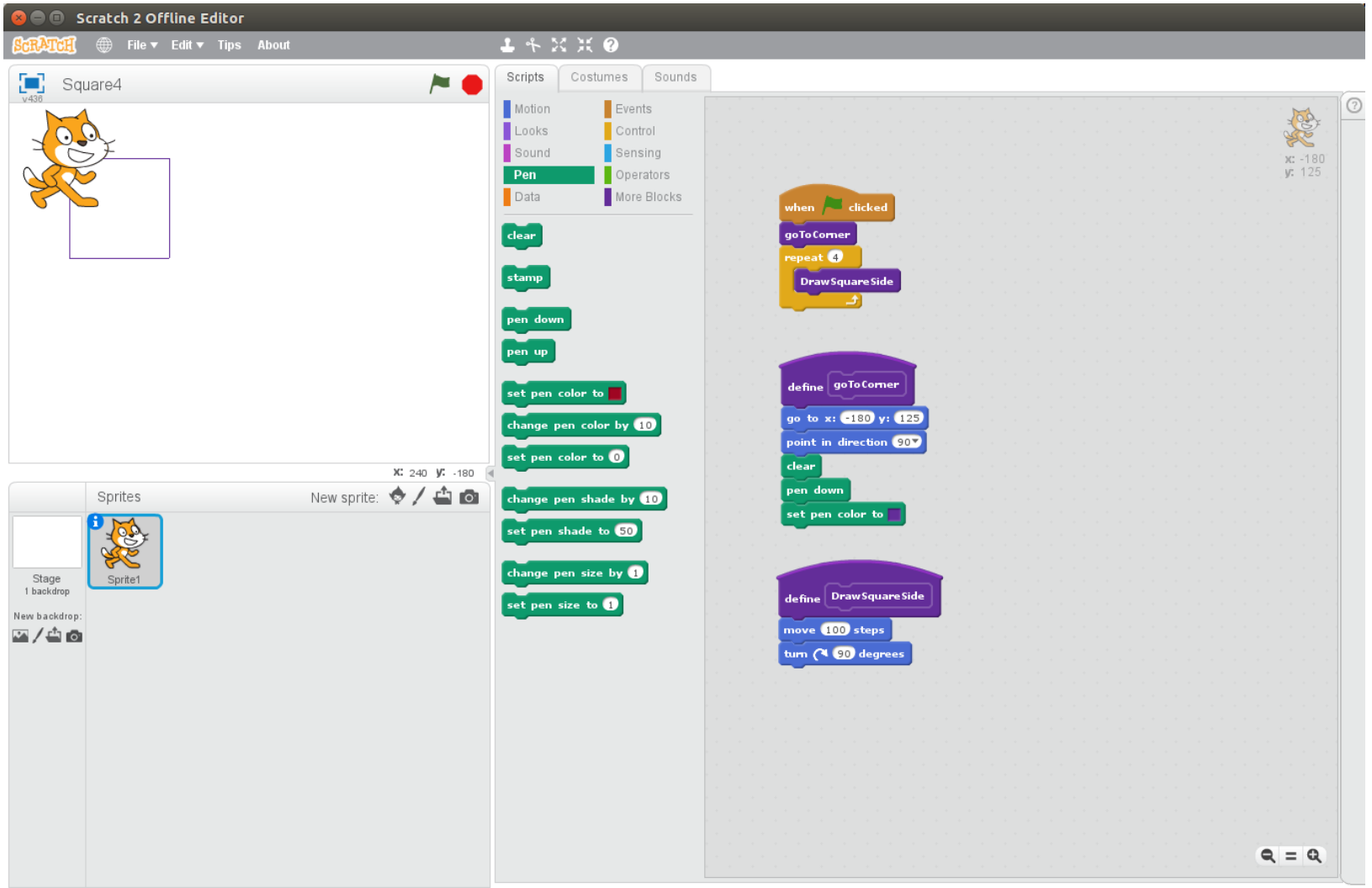
- New blocks are called functions in all other programming languages
- Functions let you name actions
  - You can then perform the action using the function name rather than repeating the sequence of actions
- Like control structures they help you avoid copying
  - Function avoid repeating sequences of actions

Recall: Draw a Square 2

- Reset
- Start drawing
- Four times
- Draw a line
- Turn 90 degrees



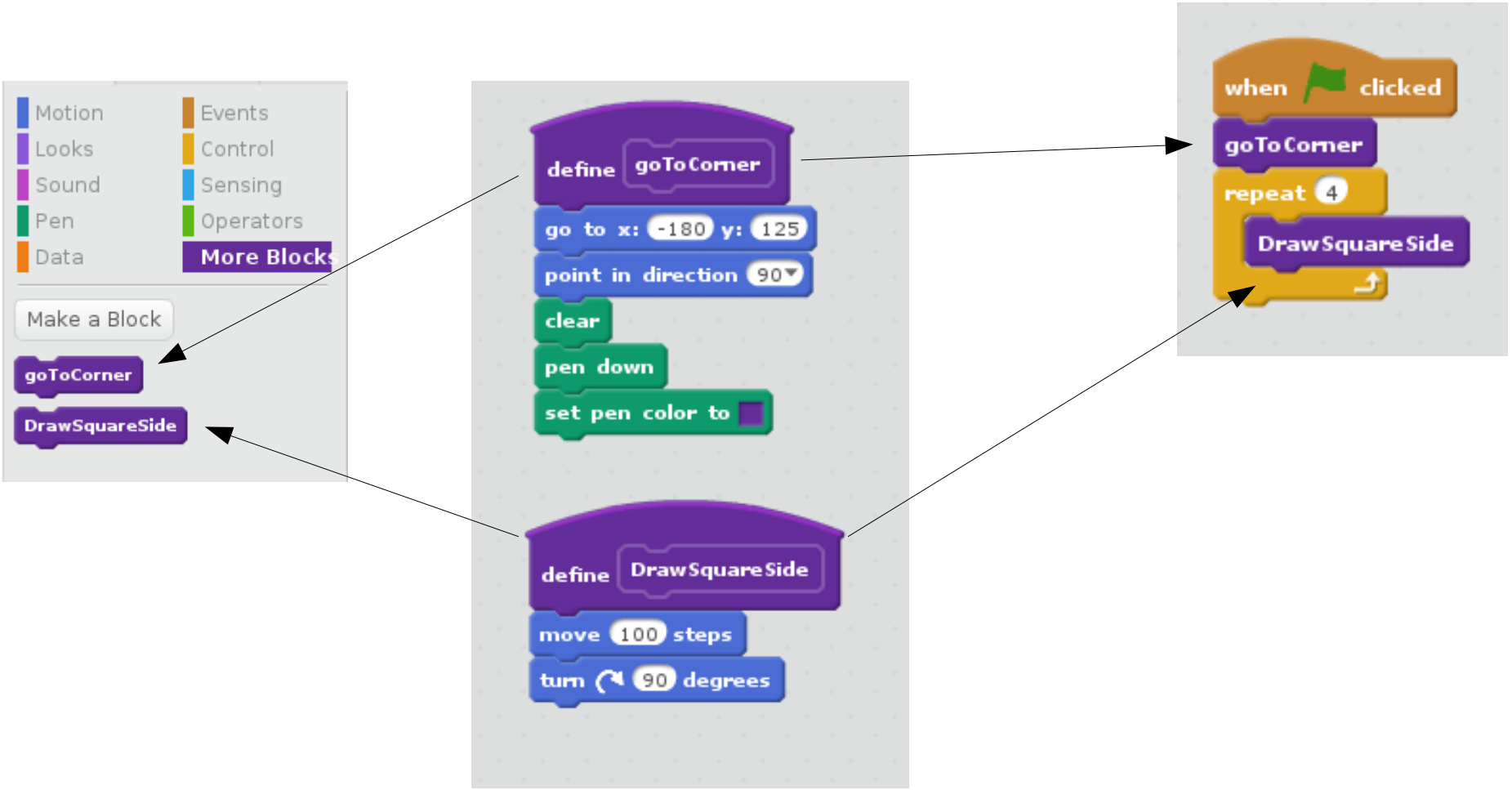
Using Function to Draw a Square



Draw a Square 3

- Call goToCorner
- Define goToCorner
- Call drawSquareSide
- Define drawSquareSide

Square 3

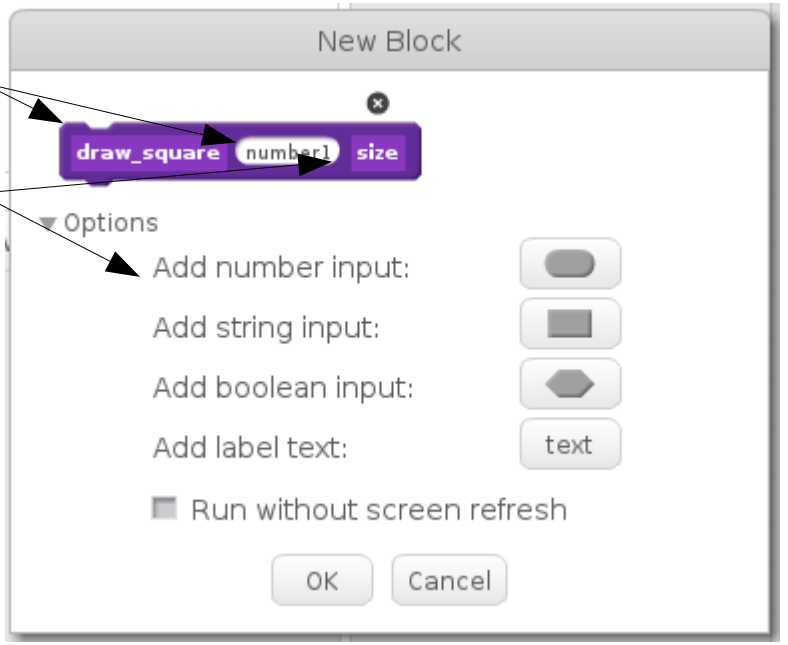

Motion
Looks
Sound
Pen
Data
Events
Control
Sensing
Operators
More Blocks
Make a Block
goToCorner
DrawSquareSide
define goToCorner
go to x: -180 y: 125
point in direction 90
clear
pen down
set pen color to
define DrawSquareSide
move 100 steps
turn 90 degrees
when clicked
goToCorner
repeat 4
DrawSquareSide

Parameters

- Parameters let you change the way functions work.
  - They provide functions values they can use

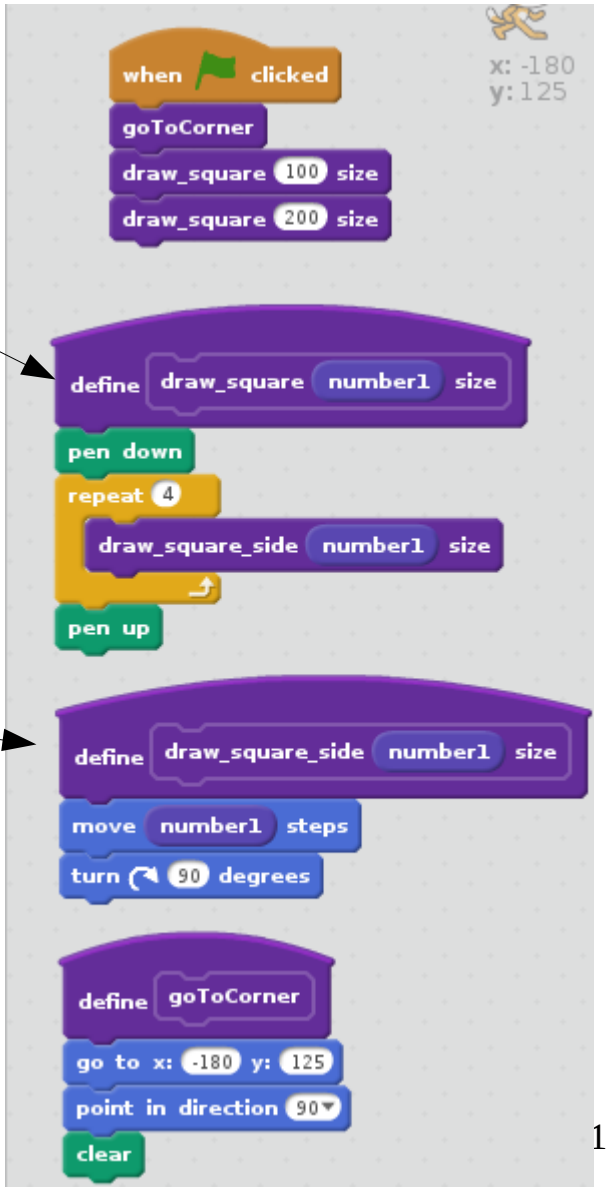
Draw Squares

- Add block name
- Add number input
- Add text



Draw Squares 1

- Draw square of size “square_size” by drawing four sides of size “square_size”.
- Draw side by drawing line of size “side_size” then turning 90 degrees.



New blocks clarify program

- Names make it easier to understand what the program is doing.
  - Block draw_square square_size size describes intent.
    - Repeat draw_side square_size four times is pretty clearly the way to draw a square of any size.
  - Block draw_side side_size describes intent
    - Draw line side_size length the turn 90 degrees looks right.
- The program says draw a square of size 100, then a square of size 200.