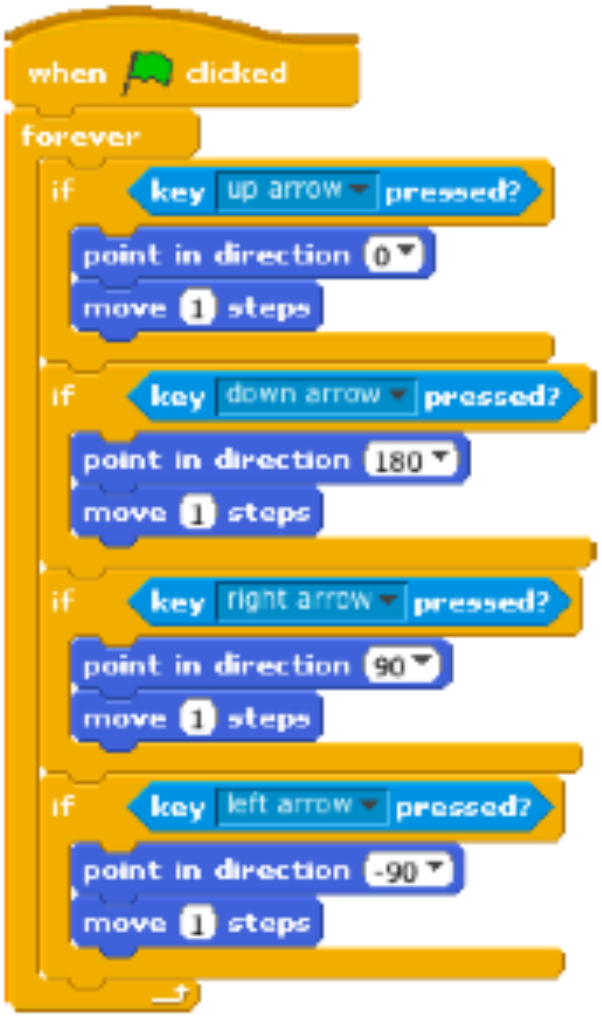
Debugging

- warm-up activity
- find a partner
- find the bugs (errors) in the Scratch code
- it is okay if you don't come up with the "Scratch" solution but you should talk with you partner about the bug and how each of you might fix it
- hint: there is no one right answer!

Possible Scratch Solutions



What process did you follow when looking for bugs?

?

- term coined by **Grace Hopper** in the 1940s when she found a moth in the Mark II computer she was working on

- the moth was jammed in one of the relays causing the computer to fail

- **debugging**: method of figuring out why a process or system doesn't work properly.

Debugging

- will be talking about 2 overall themes throughout the lecture
- debugging software/hardware you use in everyday life but do not write or build
- debugging code that you write (e.g., Processing code)

Who is to blame for bugs in software?

- You! .. usually
- computers are predictable
- they do exactly what they are told to do
- computers can't think for themselves
- if they weren't programmed to do it; they will fail
- software errors are much more rare than human errors!

Consider 0's (zeros) and O's (oh's)

- or even l's (el's) and 1's (ones) for that matter
- what if the user types in an oh when they mean a zero
- how could the computer be programmed to figure it out?

Consider 0's (zeros) and O's (oh's)

- could be programmed to converted oh's to zero's
- but what if each has a different meaning
- can you think of any situations where it would be important to know which one the user entered?
- now it becomes very important for the user to be very precise when entering information

Debugging in Everyday Life

- you more than likely have debugged long before the start of learning Processing in this class
- can you think of anything you have "debugged"?

Debugging Process

- 1. run the program; reproduce the same exact error
- 2. state/determine the error
- 3. eliminate the “obvious” cases
- 4. Divide! Eliminate the parts of code that work properly
- 5. Go back to step 1

Debugging Process

- 1. run the program; reproduce the same exact error
- why?

Debugging Process

- 2. state/determine the error
- 3. eliminate the “obvious” cases
- how do we do this in Processing? in Scratch?

Debugging Process

- 4. Divide! Eliminate the parts of code that work properly
- why would this make it easier?
- lets take a look at Chelsey and Lisa's code
- they have a bug, but there code is 7 pages long! we need to narrow down the problem.

Debugging Process

- in groups of 3 or 4 find the bug in their code
- fix it on paper
- Chelsey & Lisa prepare a brief explanation to give to the class about the bug once they have found it

Debugging Process

- 5. Go back to step 1
- why?
- When should you stop the process?

User Friendly Programing

- how can you write user friendly code so that the user knows when they have entered “bad” information?
- lets take a look at Shari and Stefan’s code