

Max/Min Algorithm

A quick discussion

Finding the max

- The idea is that you want to take 10 numbers and decide which is the biggest.
- You DON'T want to make 10 variables
- You only get one number at a time, how do you do it?

Incremental Approach

- Keep track of which number you think is the biggest ***so far***
- Each time you get a new number, see if it's bigger than your previous biggest. If it is, change your biggest.
- By the end, you should know which is the biggest

Graphical Example



Here's my first number, which is automatically the biggest so far

biggest: 6

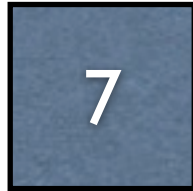
Graphical Example



Here's my next number, which not bigger,
so I won't use it

biggest: 6

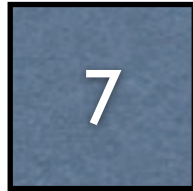
Graphical Example



My next number is bigger, so I need to change my variable.

biggest: 6

Graphical Example



That's better.

biggest: 7

Graphical Example



10

My next number is bigger again, so I need to make another change.

biggest: 7

Graphical Example



Etc

biggest: 10

Standard Algorithm

```
EasyReader console = new EasyReader();  
System.out.print("Enter 10 numbers please:");  
int biggest = console.readInt();
```

```
for(int i=0; i<9; i++) //run 9 times  
{  
    System.out.print("Next:");  
    int next = console.readInt();  
  
    if(next > biggest)  
        biggest = next;  
}
```

//at this line of code, biggest is now the largest number entered

BAD Algorithm

```
System.out.print("Enter 10 numbers please: ");  
int biggest = -1;
```

```
for(int i=0; i<10; i++) //run 10 times  
{  
    System.out.print("Next: ");  
    int next = reader.readInt();  
  
    if(next > biggest)  
        biggest = next;  
}
```

if you enter all negative numbers, this code will say that -1 is the biggest!

only okay if you know all inputs will be positive

Good Algorithm

```
System.out.print("Enter 10 numbers please: ");  
int biggest = -1;
```


```
for(int i=0; i<10; i++) //run 10 times
```

```
{  
    System.out.print("Next: ");  
    int next = reader.readInt();
```

```
    if(i == 0 || next > biggest)  
        biggest = next;
```

```
}
```

This makes it so that
the first number is
considered the biggest



Min Finder

- Same essential algorithm, except that you'll look for new numbers that are less than the number you think is the smallest so far.

