Welcome to Com S 227, Day 2

*Please turn off your phone!*

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**Last time**

- Programming means
  - Writing instructions (code) for a machine to execute
  - Organizing code into a collection of *objects* that interact
    - (For the moment) an object is just a model or representation, in software, of some “thing” in the world
Agenda

• An example of the kinds of instructions a machine can execute
• An example of creating and running a simple Java program

Example: find the biggest number in a list

43 17 85 32 86 79 18

It’s easy to spot, right?
But what if you had a bigger list?
Example: find the biggest number in a list

196 61 429 105 522 398 144 274 23 354 145 47 511 516 278 507 526 404 27 16 486
320 284 56 395 318 178 4 217 354 160 279 510 98 345 568 257 98 435 234 493 124
171 96 542 397 349 393 540 379 37 513 159 329 213 58 404 526 170 33 422 399 535
323 150 432 422 116 231 140 434 188 305 542 449 504 108 99 410 189 259 83 573
310 332 51 120 244 325 530 417 84 180 407 391 93 264 484 570 530 17 102 324 76
248 564 265 247 170 262 370 509 108 398 176 370 21 527 61 544 517 495 49 29 185
198 395 112 77 37 417 350 83 444 149 469 299 346 281 512 351 95 474 443 488 517
83 494 18 330 438 336 49 371 32 402 241 442 549 64 43 338 206 571 246 519 18
284 513 133 205 305 481 90 518 297 565 184 210 131 270 238 24 532 142 168 28 1
364 128 90 355 277 42 543 440 223 546 193 245 490 270 218 226 259 442 392 481
316 185 395 437 231 148 40 34 21 407 14 109 312 274 350 372 516 445 566 354
247 80 281 318 501 60 297 291 66 134 501 275 271 190 91 298 23 506 511 313 337
408 496 544 478 282 138 342 215 384 227 525 103 18 52 378 436 519 371 164
552 309 355 336 373 37 457 27 574 515 37 166 317 351 213 499 296 30 282 156
361 465 483 568 186 525 103 18 34 305 19 445 374 379 486 112 522 392 388 287

A strategy or “algorithm”

1. Look at the first number, and remember it
2. Read through the rows from left to right
3. If we’ve run out of numbers, then we’re done.
4. Otherwise, look at the next number and compare it to the maximum we remembered
5. If the new number is bigger, then remember that one instead
6. Go back to step 3
Programming

• We can turn these steps into a program by writing them down carefully in a programming language
• The statements in a programming language are translated, or compiled, into machine instructions
  – Numeric codes that control the millions of tiny electrical switches in the processor

Basic ingredients of computation

1) Store a value so we can remember it later
2) Do basic arithmetic
3) Check a condition and take some action, depending on whether the condition is true
4) Repeat some action, continuing as long as a condition is true
5) Get input or produce output

And that’s all any computer can do!
A simple Java program

- Write the program in a text editor
- Invoke the Java compiler to create the class file (machine instructions)
- Invoke the Java runtime to execute the compiled code

- We usually use an integrated development environment to perform these steps.
A simple Java program

```java
public class HelloPrinter {

   /**
    * The 'main' method is always the entry point
    * for a Java application.
    */
   public static void main(String[] args) {
      // Display a greeting on a text console
      System.out.println("Hello, world!");
   }

}
```