CompSci 4
Java (cont)
Nov 21, 2006

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Announcements

• Assignment 7
  – Storyboard due Nov 28
  – Alice world due Nov 30

• More APT’s
  – String parts, Arrays
Review from last time

• What is Eclipse?
  – Environment to aid you in writing Java code

• What is an APT?
  – Tester for one method at a time
Review Strings

- `String word = “CompSci 4”;`
- `word.length()` – returns length of string
- `word.toCharArray()` – returns string as an array of characters
- `word.charAt(5)` – returns character at position 5
- Loop over characters in a string
  ```java
  for (char ch : word.toCharArray)
  {
  }
  ```
More on Strings

- `word.indexOf("Sci")`
  - Returns first position of “Sci” in word or –1 if not in word

- `word.substring(4, 6);`
  - Returns string that starts at position 4, goes up to but not including position 6 and is of length 2

- `word.substring(4)`
  - Returns string that starts at position 4 til the end of the string

- `word = word + " rocks";`
  - Build a string – append to the right end
Print out a value

- `System.out.println(string value);`

- Prints out on one line
Example

String course = "CompSci 4 Spring 2006";
System.out.println(course);

int pos = course.indexOf("Spring");
String part1 = course.substring(0, pos);
String part2 = course.substring(pos+6);
course = part1 + "Fall" + part2;
System.out.println(course);
Arrays

• Parameter: double [] numbers
  – Means an array of doubles
  – Name of array is numbers
• Loop over items in an array
  for (int k = 0; k < numbers.length; k ++)
  {
    // do something with numbers[k]
    // kth double in array numbers
  }
  – Note length applied to arrays – no parens
Array Example

• Find max number, assume at least one number in the array

```java
public double MaxInArray(double [] numbers)
{
  double max = numbers[0];
  for (int k =1; k < numbers.length; k++)
  {
    if (numbers[k]> max)
    {
      max = numbers[k];
    }
  }
  return max;
}
```
Problem: DNA Max

• Given an array of DNA strands and a nucleotide (a, c, g, or t)
• Return the strand with the most occurrences of the nucleotide
• If there is more than one strand with the max number, return the longest such strand
Example

• Given array
[“agt”, “aagt”, “taattt”, ccatg”]
• Given nucleotide “a”
• Returns “taattt”
• “a” appears 2 times max in a strand
• Longest such strand is “taattt”
Solve this problem in Eclipse

```java
public class DNAMaxNucleotide {
    public String max(String[] strands, String n) {
        // fill in code here
    }
}
```

- What steps do we do?
Classwork today – More APTs

• Test java methods using APT
• Create a new Java project called CPS4Sec1Nov21
• Create three new classes based on APT problems – test with APT
• Submit the project for grading under today’s date
Classwork Problems

• DNA Complement
  – Name class: DNAComplement

• DNA 3 – Finding Proteins
  – Name class: ProteinFinder

• Extreme Judgment
  – Name class: Judgment