CompSci 4
Java (cont)
Nov 21, 2006

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
  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

```java
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
  ```java
  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", "taatt", "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