Classroom Technology

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Classroom Presenter Project

- Tablet PC Lecture Presentation
  - Integration of Slides and Ink
- Tablet PC Based Interaction System
  - Computer support for Active Learning
- Collaborative Project with Microsoft Research
- External Research and Programs
- Freely available for educational use
- Classroom Presenter 3 is now available
  - Recommended version for wireless use
Draw a picture of something from Seattle
Classroom Presenter

Draw a picture of something from Seattle

Draw a picture of something from Seattle
Student Attention vs. Time

Attention

<table>
<thead>
<tr>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
</tr>
<tr>
<td>20</td>
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<tr>
<td>30</td>
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<td>40</td>
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<tr>
<td>50</td>
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<td>60</td>
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</table>
Brainstorming

• What problems might arise if students are allowed to use Tablet PCs in the Classroom?
This Year’s Deployments at UW

- CSE 421, Design of Algorithms
- BUAA 421, TVI offering of CSE 421 at Beihang University, China
- CSE 370, Digital Design
- CSE 326, Data Structures
- CSE 142, CS1 Discussion Section
- ESRM 301, Maintaining Nature in an Urban and Urbanizing World
- ESRM 302, Restoration Design
- ESRM 303, Preserving Wildland
Parameter Mystery #2

What output is produced by the following program?

```java
public class ParameterMystery2 {
    public static void main(String[] args) {
        String major = "fred";
        String fred = "computer";
        String computer = "department";
        String department = "student";
        String student = "major";

        sentence("fred", "honor", computer);
    }

    public static void sentence(String major, String fred, String foo) {
        System.out.println("Many a " + foo + " in the " + fred + " of " + major);
    }
}
```
Array Simulation 1.

Simulate the execution of the following method with each of the following arrays passed as its parameter, and write the value it would return:

```java
class ArraySimulation {
    public static int mystery(int[] list) {
        int x = 0;
        for (int i = 1; i < list.length; i++) {
            int y = list[i] - list[0];
            if (y > x) {
                x = y;
            }
        }
        return x;
    }
}
```

<table>
<thead>
<tr>
<th>Array</th>
<th>Value returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>{5}</td>
<td></td>
</tr>
<tr>
<td>{3, 12}</td>
<td></td>
</tr>
<tr>
<td>{4, 2, 10, 8}</td>
<td></td>
</tr>
<tr>
<td>{1, 9, 3, 5, 7}</td>
<td></td>
</tr>
<tr>
<td>{8, 2, 10, 4, 10, 9}</td>
<td></td>
</tr>
</tbody>
</table>
Design example: 2x2-bit multiplier (activity)

K-map for P8

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K-map for P4

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K-map for P2

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K-map for P1

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Root & shoot growth of 2 Species

Soil Moisture
Soil Temperature

January

December

0°C
5°C
15°C

Douglas-fir
Pacific silver fir

Shoot
Root

Diagram when root growth occurs (draw within brown bars).
Exercise: Based on patterns, levels and variation, describe in short phrases the region of the globe described by each diagram. Justify (Hint: for St. Louis, cool to cold winters, relatively even rainfall; temperate, moist-continental).

A:  

B:  

Left: There is some ppt in Jan & Feb. Barely visible.
Compute the bottleneck shortest paths
Find MST using Prim’s

<table>
<thead>
<tr>
<th>V</th>
<th>Kwn</th>
<th>Distance</th>
<th>path</th>
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</thead>
<tbody>
<tr>
<td>v1</td>
<td>T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>v2</td>
<td>T</td>
<td>2</td>
<td>V_1</td>
</tr>
<tr>
<td>v3</td>
<td>T</td>
<td>4</td>
<td>V_2</td>
</tr>
<tr>
<td>v4</td>
<td>T</td>
<td>1</td>
<td>V_3</td>
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<tr>
<td>v5</td>
<td>T</td>
<td></td>
<td>V_4</td>
</tr>
<tr>
<td>v6</td>
<td>T</td>
<td>3</td>
<td>V_5</td>
</tr>
<tr>
<td>v7</td>
<td>T</td>
<td>4</td>
<td>V_6</td>
</tr>
</tbody>
</table>

Order Declared Known: V_1 V_2 V_3 V_4 V_5 V_6 V_7

Cost = 16

Splay D

Determine the LCS of the following strings

BARTHOLEMÆWSIMPSON
KRUSTYTHECLOWN
RTHOWN

Problem Reduction Examples

• Reduce the problem of finding the Maximum of a set of integers to finding the Minimum of a set of integers

Find the maximum of: 8, -3, 2, 12, 1, -6

Construct an equivalent minimization problem
www.cs.washington.edu/education/dl/presenter

For more information, contact
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Classroom Assessment

What is the result of the assignment: `p.next.next = p.next;`
Arrays are objects?
  • Yes: parameters and return values, fields like length, ...
  • Different syntax than other objects.

What’s the different between:

```java
public static void main(String args[])
{
    int myInt = 1;
    mystery(myInt);
    System.out.print(myInt);
}

public static int mystery(int i) {
    i++;
}
```

```java
public static void main(String args[])
{
    int[] myArray = {1,2,3,4};
    mystery(myArray);
    System.out.print(myArray[0]);
}

public static int[] mystery(int[] a) {
    a[0]++;
}
```
Parameter Mystery #3

When the method `sentence` is called in `main`, three `String` values are passed in as parameters. Draw arrows from each parameter of the method `sentence` to its corresponding `String` value.

```java
public class ParameterMystery3 {
    public static void main(String[] args) {
        String a = "king";
        String b = "two";
        String c = "queen";
        String two = "five";

        sentence(two, "two", a);
    }

    public static void sentence(String b, String c, String a) {
        System.out.println("a " + c + " and a " + a + " beats a " + b);
    }
}
```

What output is produced?
Random Numbers 8.

Write code that prints a random number of lines between 2 and 10 lines inclusive, where each line contains a random number of 'x' characters between 5 and 20 inclusive. For example:

```
xxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxx
xxxxxxxxxxxx
```

Problem Solving

• You have three coins:
  – One coin with two heads, one coin with two tails, and one coin with a head and a tail
• Suppose you choose a coin at random, flip it in the air and it lands heads.
  – What is the probability that its other side is a head?