A writeup for my favorite class

Me Myself

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Abstract

This writeup summarizes the design and findings of my first project in csci350, Spring09.

1 Overview

This project acts as a miniature GIS and lets the user execute the followig commands:

```
gis>help
2drender grid.ass
3drender grid.asc
flowdir elev.asc dir.asc
flowaccu elev.asc dir.asc accu.asc
bye
gis>
```

To start a new paragraph you need to start a new line.

The `flowdir` program computes the flow direction grid corresponding to an elevation file.

The `flowaccu` program computes the flow accumulation grid corresponding to an elevation file and a flow direction file.

2 Algorithm and analysis

Flow direction. The flow direction computation works by iterating in order over the grid, and computing, for each point (i, j), the neighbor of minimum height. A neighbor is considered a point $(i + / - 1, j + / - 1)$.

Space: My algorithm is very space-aware. Or is it space-oblivious.

Time: And the running time is also outstanding.

Flow accumulation. And here is my flow accumulation approach. The flow accumlaion algorithm works as follows...

Space: The array is $a_1, a_2, ..., a_n$.

Time: The running time is $O(n \log n)$ if $n > 3$ otherwise it is $O(n^3)$.

3 Experimental evaluation

To determine the performance in practice of my algorithms I performed a careful experimental evaluation.

Platform. The code was written in C, compiled with `gcc 4.0.2, -O3`, 64 bits enable, and executed on a Mac dual core 2.xx GHZ, 4GB RAM you check all these things, right? running Leopard.

Datasets: The test datasets are real-life grid terrains ranging from 1 million to 1,000 million points. They are given in Table **??** below.

Dataset	nb. of points
Kaweah	$1.6 \cdot 10^6$
Sierra	$9.5 \cdot 10^6$
East-Coast USA (usadem2)	$246 \cdot 10^6$
Washington State	$1,066 \cdot 10^6$

Table 1: Size of terrain datasets.

The running times for `flowaccu` and `flowdir` are summarized in Tables **??** and **??**. Don't worry about the placement of tables cause Latex places the figures and table the best it can. That's not always where you want them.

Dataset	time	CPU
Kaweah	?	?
Sierra	?	?
East-Coast USA (usadem2)	?	?
Washington State	?	?

Table 2: Running times (seconds) and CPU-utilization for `flowdir`.

Dataset	time	CPU
Kaweah	?	?
Sierra	?	?
East-Coast USA (usadem2)	?	?
Washington State	?	?

Table 3: Running times (seconds) and CPU-utilization for `flowaccu`.

4 Conclusion

The conclusion goes here.