

COSC 2P03 - Assignment #3

Due Date: Dec 1, 2008, 3pm

Late Date: Dec 4, 2008, 3pm

Please read the following questions carefully.

Print all your source code (including comments) as well as a few samples of execution and include them in your hardcopy assignment submission.

1) **Printing Queue.** You are to write a printing queue based on a heap, which will schedule jobs to a printer. The printing queue should adhere to the following rules:

- Smaller print jobs (in terms of pages) should be printed first
- The printer can only print one job at a time and has infinite memory
- The printer can print 4 pages/minute in colour and 8 pages/minute in black & white

You are to perform a simulation and output a transcript of events that occur sorted by time. The input will be provided in a file called “part1in.txt” which contains one print job per line. Each job is defined by an id, a relative arrival time (the number of seconds after the arrival of the previous job), the number of pages and a type (whether it’s colour or black & white)

E.g.	1	0	10	black
	2	5	5	colour
	3	20	2	black
	...			

In the above example, the first job (10 pages black & white) arrives immediately. The second job (5 pages colour) arrives 5 seconds after the arrival of job #1. The third job (2 pages black & white) arrives 20 seconds after job #2.

Your output should be written to a file called “part1out.txt” and should look like the following:

0 seconds	job #1 arrives	10/black
0 seconds	job #1 starts printing	10/black
5 seconds	job #2 arrives	5/colour
25 seconds	job #3 arrives	2/black
75 seconds	job #1 finished printing	10/black
75 seconds	job #3 starts printing	2/black
...		

- | | | |
|------|--------|----|
| E.g. | insert | 10 |
| | insert | 20 |
| | search | 30 |
| | insert | 15 |
| | search | 15 |
| | ... | |
| | quit | |

'search' will search for the given key in the hash table and print out the index where it was found

You are to use the same input file for 3 separate hash tables which use different collision resolution policies.

- After each insertion, display the content of the hash table:

E.g. 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
 15 10 20

E.g. Search for 30, Searching index 1-2-5 --- 30 not found (assuming 1 & 2 are already full)

E.g. Conflict resolution policy: Linear Probing
#collisions that occurred during inserts: 210
#collisions that occurred during search: 130

Note: Do not run all 3 hash tables concurrently, since it would be difficult for the marker to read your output. Instead, run Linear probing completely, followed by Quadratic probing, etc.

Assignment Submission Guidelines

- **This assignment must be submitted both in hardcopy and softcopy (electronically).**
- A submitted assignment with either hardcopy or softcopy version missing is deemed incomplete and will be penalized.
- **To make an electronic submission, execute the program 'submit2p03' on sandcastle.cosc.brocku.ca from the directory that contains all the files that you want to submit, and only these files.** This program will copy the contents of the current directory to the marker's account.
- **The hardcopy submission must include all source code (including comments) as well as a few examples of execution.** These should be printed on a laser or inkjet printer.
- All the papers must be stapled together at the upper left-hand corner of the page and should be placed in a 9" x 12" sealed envelope.
- A standard assignment cover-page (<http://www.cosc.brocku.ca/forms/cover>) should be printed, signed and stapled to the front of the outside of the envelope.
- The submission should be placed in the Assignment Box outside of J332, in the slot labeled COSC 2P03, before the due time indicated above. Only one submission (i.e. to the box) should be made per assignment.
- Assignments not including a coversheet will NOT be marked.
- Assignments that do not follow these guidelines will be penalized.
- Familiarize yourself with the department's policy on plagiarism and the university regulations on plagiarism and academic misconduct.