Implement Heap File with Variable Length Records

Heap File is a doubly linked list of data pages.

Structure of each page is as per the Raghu Ramakrishnan’s book. Each slot in directory should contain following information.

Record identifier (provided by the user)

Record size

Start location of the record in the page

Is the record present of deleted (only this field will take one byte)

Assume that each value takes four bytes.

Input will be of the following type

1: Create new data file

2: Insert

3: Delete

4: Display file structure

-1: Exit the program

Create new data file

Provide size of data page in bytes

Provide initial number of pages

Insert

Provide record length

Provide record identifier

Delete

Provide record identifier

Display file structure

How many pages does the page have

Contents of each page

List the whole directory structure of the page (both present and deleted record list)

Insertion Logic:

Find the first page that can accommodate the given record. If none of the existing pages can accommodate the given record then append a new page at the end of the linked list.

Deletion logic

Just mark the record as deleted in the page. No shifting of records is required.

Example input

1

500

2

//New file with two pages, each having 500 bytes

2

12

1005

//insert record of size 12 bytes and identifier 1005

2

27

1009

//insert record of size 27 bytes and identifier 1009

3

1002

//delete record with identifier 1002. Should result in error message

3

1005

//delete record with identifier 1005

4

//display file structure

-1

//exit the program