

HW6. IndexedFile

부산대학교 정보컴퓨터공학부

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신세환

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보고서에는 다음과 같은 내용을 포함하도록 한다. 양식은 자유롭게 수정하여 사용한다.

1. 문제정의

4장, 5장의 BufferFile, 재귀 컴파일을 사용하고 7장의 Indexing을 활용해서 Student클래스와 CourseRegistration 클래스를 인덱스로 접근가능하도록 설계한다

2. 클래스 정의 설명

3. 클래스의 주요 함수 설명

1) Main 함수

```
2) char *strRecording = "recording";
3)   char *myfile="recording.dat";
4)   int result;
5)
6)   TextIndex RecIndex (10);
7)   DelimFieldBuffer Buffer; // create a buffer
8)   TextIndexedFile<Student> IndFile (Buffer, 12, 10);
9)   result = IndFile . Create(strRecording);
10)  if (!result)
11)  {
12)      cout<<"Unable to create indfile "<<result<<endl;
13)      return 0;
14)  }
15)
16)  // student data
17)  vector<Student> students;
```

```

18)
19)    // course data
20)    vector<CourseRegistration> courses;
21)
22)    set_circum1(students, courses, IndFile);
23)
24)    // student index 검색
25)    Student indRec;
26)    cout<<"Search Test1"<<endl;
27)    char* key1 = "1";
28)    result=IndFile.Read(key1,indRec);
29)    if (result<0) cout <<"record not found"<<endl;
30)    else cout << indRec << endl;//indRec.Print(cout);
31)    cout<<"Search Test2"<<endl;
32)    char* key2 = "2";
33)    result=IndFile.Read(key2,indRec);
34)    if (result<0) cout <<"record not found";
35)    else cout << indRec << endl;//indRec.Print(cout);
36)
37)    IndFile.Close();
38)
39)
40)

```

testIdxFile.cpp에서 driver 프로그램을 구현하고 main에서 이를 테스트했다. Set_circum1함수로 student클래스를 테스트하기 위한 환경을 만들었고 courseRegistration클래스는 같은 방법으로 Set_circum2를 사용하였다.

41) Key 반환 함수

함수 부분

```

char * Student::Key () const
{
    // produce key as concatenation of Label and IdNum
    //ostringstream key;    // this is replaced
    ostringstream key;      // again replaced
    key << id << ends;
    //string temp = key.str();
    //return key.str();
    return strdup(key.str().c_str());
}

```

```

char * CourseRegistration::Key () const
{
    // produce key as concatenation of Label and IdNum
    //ostream key;    // this is replaced
    ostringstream key;    // again replaced
    key << courseID << ends;
    //string temp = key.str();
    //return key.str();
    return strdup(key.str().c_str());
}

```

Indexing에 사용할 키 값을 각 객체의 id로 설정하고 char*형태로 반환하였다. courseRegistration의 경우 원래라면 학생 id들을 반환해야 하는데 방법을 모르겠어서 일단 courseID를 반환하도록 했다.

4. 프로그램 실행

1) 프로그램 실행 환경

2) 프로그램 실행 방법

오류를 막기 위해 export LD_LIBRARY_PATH=/home/sk3456/git_project/hw6_indexedfile/fs24hw6-sinsehwan/lib:\$LD_LIBRARY_PATH를 먼저 실행해주고 그 다음 make를 수행해준다.

```

sk3456@DESKTOP-PQL1ORV:~/git_project/hw6_indexedfile/fs24hw6-sinsehwan$ export LD_LIBRARY_PATH=/home/sk3456/git_project/hw6_indexedfile/fs24hw6-sinsehwan/lib:$LD_LIBRARY_PATH
sk3456@DESKTOP-PQL1ORV:~/git_project/hw6_indexedfile/fs24hw6-sinsehwan$ make
mkdir -p ./lib
g++ -c -I./include -Wall -o testIdxFile.o testIdxFile.cpp
In file included from /usr/include/c++/11/backward/strstream:50,
                 from ./include/idxFile.h:6,
                 from testIdxFile.cpp:10:
/usr/include/c++/11/backward/backward_warning.h:32:2: warning: #warning This file includes at least one deprecated or antiquated header which may
notice at a future date. Please use a non-deprecated interface with equivalent functionality instead. For a listing of replacement headers and in
backward_warning.h. To disable this warning use -Wno-deprecated. [-Wcpp]
   32 | #warning \
      | ~~~~~
testIdxFile.cpp: In function 'void set_circum1(std::vector<Student>&, std::vector<CourseRegistration>&, TextIndexedFile<Student>&)':
testIdxFile.cpp:75:22: warning: comparison of integer expressions of different signedness: 'int' and 'std::vector<Student>::size_type' {aka 'long
int'}
   75 |     for(int i = 0; i < students.size(); i++)
      |                      ~~~~~
testIdxFile.cpp: In function 'void set_circum2(std::vector<Student>&, std::vector<CourseRegistration>&, TextIndexedFile<CourseRegistration>&)':
testIdxFile.cpp:125:22: warning: comparison of integer expressions of different signedness: 'int' and 'std::vector<Student>::size_type' {aka 'long
int'}
   125 |     for(int i = 0; i < students.size(); i++)
      |                      ~~~~~
testIdxFile.cpp: In function 'int main(int, char**)':
testIdxFile.cpp:155:30: warning: ISO C++ forbids converting a string constant to 'char*' [-Wwrite-strings]
   155 |     char *strRecording = "recording";
      |                               ~~~~~
testIdxFile.cpp:156:22: warning: ISO C++ forbids converting a string constant to 'char*' [-Wwrite-strings]
   156 |     char *myfile="recording.dat";

```

이후 만들어진 testIdxFile을 실행시켜준다.

```

sk3456@DESKTOP-PQL10RV:~/git_project/hw6_indexedfile/fs24hw6-sinsehwan$ ./testIdxFile
file names recording.dat recording.ind
Recording R[0] at recaddr 8 is added to TextIndexFile
Recording R[1] at recaddr 37 is added to TextIndexFile
Recording R[2] at recaddr 66 is added to TextIndexFile
Recording R[3] at recaddr 95 is added to TextIndexFile
Recording R[4] at recaddr 124 is added to TextIndexFile
Recording R[5] at recaddr 153 is added to TextIndexFile
Recording R[6] at recaddr 183 is added to TextIndexFile
Recording R[7] at recaddr 213 is added to TextIndexFile
Recording R[8] at recaddr 243 is added to TextIndexFile
Recording R[9] at recaddr 273 is added to TextIndexFile
Search Test1
1|student1|address1|2|6||11|
Search Test2
2|student2|address2|3|7||12|
result of index write: 110
file names recording.dat recording.ind
Recording R[0] at recaddr 312 is added to TextIndexFile
Recording R[1] at recaddr 342 is added to TextIndexFile
Recording R[2] at recaddr 373 is added to TextIndexFile
Recording R[3] at recaddr 410 is added to TextIndexFile
Recording R[4] at recaddr 445 is added to TextIndexFile
Recording R[5] at recaddr 486 is added to TextIndexFile
Recording R[6] at recaddr 521 is added to TextIndexFile
Recording R[7] at recaddr 558 is added to TextIndexFile
Recording R[8] at recaddr 589 is added to TextIndexFile
Recording R[9] at recaddr 619 is added to TextIndexFile
Search Test1
103|5|1|B0|3|F|9|A0|11|B0|13|F|4|
Search Test2
101|4|1|C+|7|C+|9|C+|11|C+|2|
result of index write: 110
sk3456@DESKTOP-PQL10RV:~/git_project/hw6_indexedfile/fs24hw6-sinsehwan$

```

파일에 값을 저장하고 인덱스 단위로 접근하는 것이 잘 수행됨을 알 수 있다. 테스트 편의를 위해 student와 courseRegistration모두 같은 파일에 저장했다.

5. Github 화면

(1) cloning, adding, committing, push을 위한 github 명령들을 포함

Git add

```

sk3456@DESKTOP-PQL1ORV:~/git_project/hw6_indexedfile/fs24hw6-sinsehan$ git status
On branch main
Your branch is up to date with 'origin/main'.

Untracked files:
  (use "git add <file>..." to include in what will be committed)
    Makefile
    buf/
    fixed/
    include/
    index/
    student_reg/
    testidxFile.cpp
    var/

nothing added to commit but untracked files present (use "git add" to track)
sk3456@DESKTOP-PQL1ORV:~/git_project/hw6_indexedfile/fs24hw6-sinsehan$ git add .
sk3456@DESKTOP-PQL1ORV:~/git_project/hw6_indexedfile/fs24hw6-sinsehan$ git commit -m "add source code [ADD]"
[main 0516694] add source code [ADD]
31 files changed, 2141 insertions(+)
create mode 100644 Makefile
create mode 100644 buf/Makefile
create mode 100644 buf/buffile.cpp
create mode 100644 buf/ioBuffer.cpp
create mode 100644 buf/recfile.cpp
create mode 100644 fixed/Makefile
create mode 100644 fixed/fixfld.cpp
create mode 100644 fixed/fixlen.cpp
create mode 100644 fixed/tindbuff.cpp
create mode 100644 include/buffile.h
create mode 100644 include/courseRegistration.h
create mode 100644 include/delim.h
create mode 100644 include/fixfld.h
create mode 100644 include/fixlen.h
create mode 100644 include/indfile.h
create mode 100644 include/ioBuffer.h
create mode 100644 include/recfile.h
create mode 100644 include/student.h
create mode 100644 include/textind.h
create mode 100644 include/tindbuff.h
create mode 100644 include/varlen.h
create mode 100644 index/Makefile
create mode 100644 index/indfile.cpp
create mode 100644 index/textind.cpp
create mode 100644 student_reg/Makefile
create mode 100644 student_reg/courseRegistration.cpp

```

Git commit, push

```

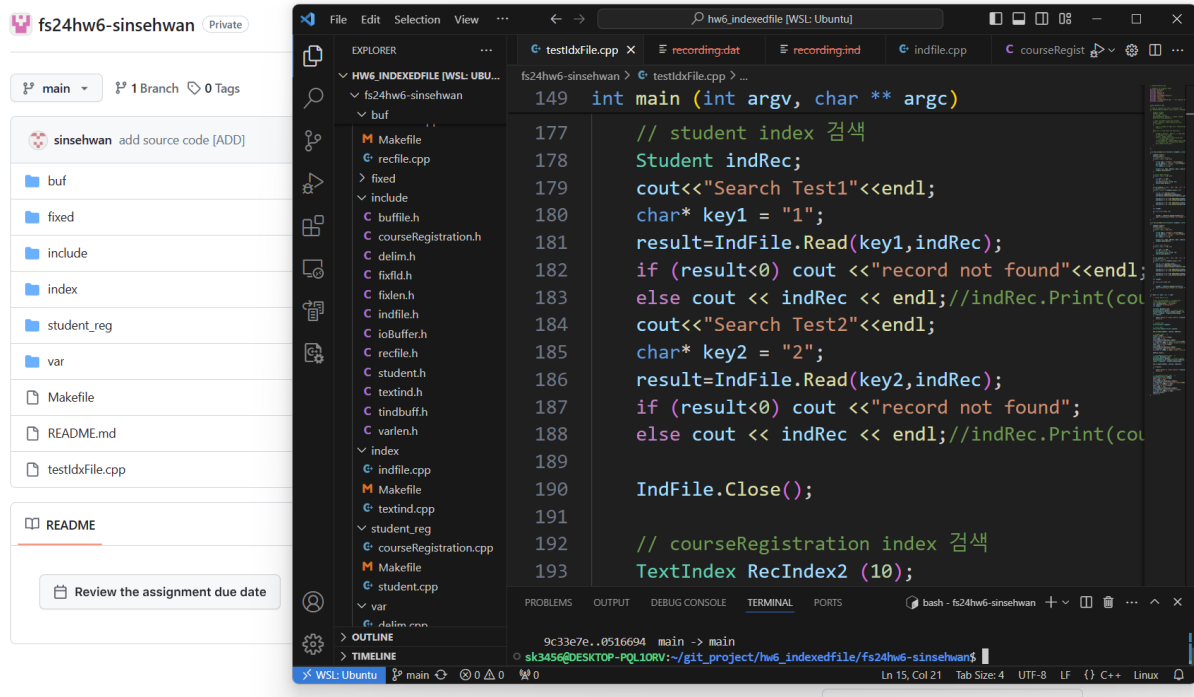
sk3456@DESKTOP-PQL1ORV:~/git_project/hw6_indexedfile/fs24hw6-sinsehan$ git status
On branch main
Your branch is up to date with 'origin/main'.

Untracked files:
  (use "git add <file>..." to include in what will be committed)
    Makefile
    buf/
    fixed/
    include/
    index/
    student_reg/
    testidxFile.cpp
    var/

nothing added to commit but untracked files present (use "git add" to track)
sk3456@DESKTOP-PQL1ORV:~/git_project/hw6_indexedfile/fs24hw6-sinsehan$ git add .
sk3456@DESKTOP-PQL1ORV:~/git_project/hw6_indexedfile/fs24hw6-sinsehan$ git commit -m "add source code [ADD]"
[main 0516694] add source code [ADD]
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create mode 100644 fixed/fixlen.cpp
create mode 100644 fixed/tindbuff.cpp
create mode 100644 include/buffile.h
create mode 100644 include/courseRegistration.h
create mode 100644 include/delim.h
create mode 100644 include/fixfld.h
create mode 100644 include/fixlen.h
create mode 100644 include/indfile.h
create mode 100644 include/ioBuffer.h
create mode 100644 include/recfile.h
create mode 100644 include/student.h
create mode 100644 include/textind.h
create mode 100644 include/tindbuff.h
create mode 100644 include/varlen.h
create mode 100644 index/Makefile
create mode 100644 index/indfile.cpp
create mode 100644 index/textind.cpp
create mode 100644 student_reg/Makefile
create mode 100644 student_reg/courseRegistration.cpp

```

(2) 소스 코드와 makefile을 push한 후, 본인의 Github repository를 스크린 캡처하여 포함



6. 논의 사항

- courseRegistration객체를 courseId가 아닌 학생 id로 접근을 어떻게 해야 할까 생각해봐야 한다.
- 7장 소스 코드가 char*, char**형 변수가 많았는데 이를 기존에 사용했던 코드에서의 string 멤버들과 호환되게 모든 메소드들을 수정하는 작업이 힘들었다.