자료구조론 숙제 #3

Announce: 2018. 6. 8.
Due Date: 2018. 6. 16. 6pm (tight)
제출방법: problem4.c를 본인의 학번으로 압축해서 포탈 과제3에 제출
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3. **[problem4.c, 5점]** 강의 시간에 배운 체이닝(chaining) 기반 해싱(hashing)을 이용하여 다음 출력 결과와 같이 입력 받은 개수(number of buckets)만큼의 버켓(bucket)에 학번(student ID)을 키(key)로 하여, 이름(name)과 성적(score)를 저장, 삭제, 탐색하거나, 전체 데이터를 일괄 출력하는 프로그램을 작성하라. 단, 해시함수는 k mod *<number of buckets>*를 사용하며, 학번과 성적은 int, 이름은 char[30]를 이용한다.

(출력 결과) *붉은 색 글자는 실제 입력 사례를 의미

```
Enter the number of buckets:7

1)insert 2)delete 3)search 4)display 5)exit
Enter your selection:6
Error: Wrong selection.

1)insert 2)delete 3)search 4)display 5)exit
Enter your selection:1
Enter student ID to insert:2017999999
Enter name:Erica Lee
Enter score:90

1)insert 2)delete 3)search 4)display 5)exit
Enter your selection:1
Enter student ID to insert:2017123456
Enter name:Hanyang Kim
Enter score:85

1)insert 2)delete 3)search 4)display 5)exit
Enter your selection:1
Enter student ID to insert:2017777777
Enter name:Lion Jang
```

```
Enter score:95

1)insert 2)delete 3)search 4)display 5)exit
Enter your selection:4

Bucket#1
Student ID  Name         Score
2017999999  Erica Lee    90
2017777777  Lion Jang    95

Bucket#5
Student ID  Name         Score
2017123456  Hanyang Kim 85

1)insert 2)delete 3)search 4)display 5)exit
Enter your selection:2
Enter student ID to delete:201777777
Error: The student ID is not found.

1)insert 2)delete 3)search 4)display 5)exit
Enter your selection:2
Enter student ID to delete:2017777777
Successfully deleted.

1)insert 2)delete 3)search 4)display 5)exit
Enter your selection:4

Bucket#1
Student ID  Name         Score
2017999999  Erica Lee    90

Bucket#5
Student ID  Name         Score
2017123456  Hanyang Kim 85

1)insert 2)delete 3)search 4)display 5)exit
Enter your selection:3
Enter student ID to search:2017123456

Student ID  Name         Score
2017123456  Hanyang Kim 85
```

```
1)insert 2)delete 3)search 4)display 5)exit
Enter your selection:5
Bye!
```

(참조) 필요에 따라 아래의 코드를 활용해도 좋음

```
int main() {
	int n, ch, key, score;
	char name[30];
	printf("Enter the number of buckets:");
	scanf("%d", &n);
	bucketCount = n;
	hashTable = (struct hash *)calloc(n, sizeof (struct hash));
	while (1) {
		printf("\n1)insert 2)delete 3)search 4)display 5)exit\n");
		printf("Enter your selection:");
		scanf("%d", &ch);
		switch (ch) {
			case 1:
				printf("Enter student ID to insert:");
				scanf("%d", &key);
				getchar();
				printf("Enter name:");
				fgets(name, 30, stdin);
				name[strlen(name) - 1] = '\0';
				printf("Enter score:");
				scanf("%d", &score);
				insertToHash(key, name, score);
				break;

			case 2:
				printf("Enter student ID to delete:");
				scanf("%d", &key);
				/* delete node with "key" from hash table */
				deleteFromHash(key);
				break;

			case 3:
				printf("Enter student ID to search:");
				scanf("%d", &key);
```

```
                        searchInHash(key);
                        break;
                case 4:
                        display();
                        break;
                case 5:
                        printf("Bye!\n");
                        exit(0);
                default:
                        printf("Error: Wrong selection.\n");
                        break;
            }
        }
        return 0;
}
```