Intermediate C Programming

Lesson6

Search (1)

Today's outline

- Search
- Serial search
- Exercise

Search

- Search

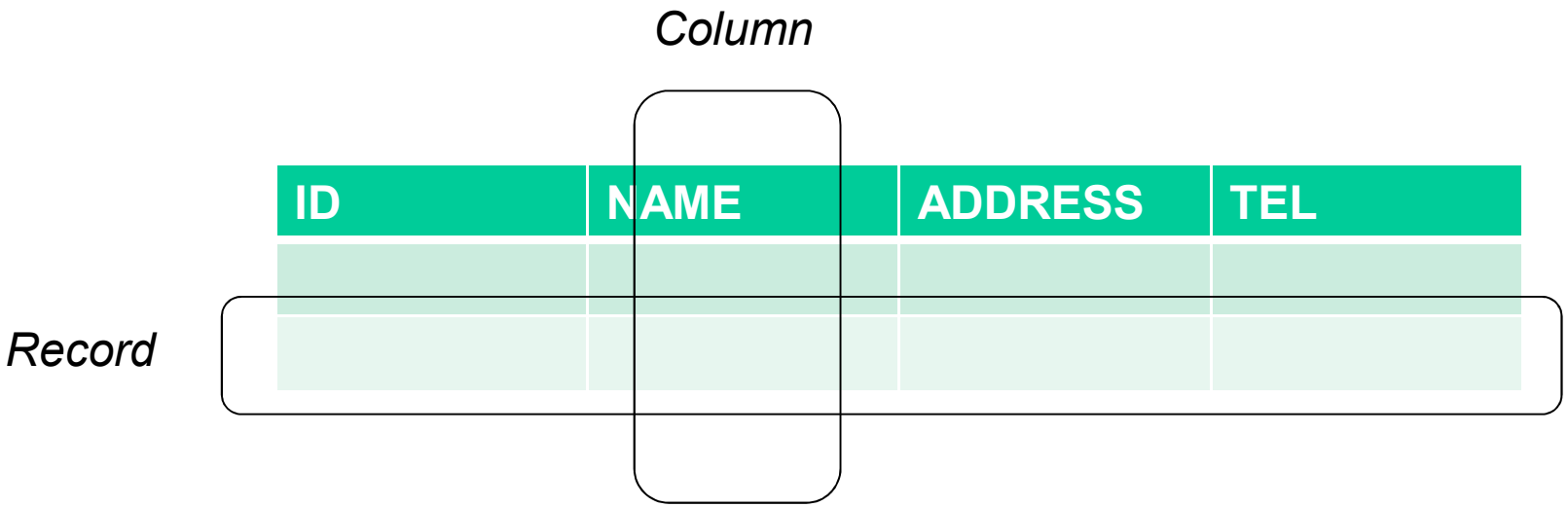
Searching Algorithm is to find an item with specified properties among a collection of items

To find the specified item from a huge number of items

- Algorithms

1. Serial search
2. Binary search

Search



- Record

One person's data

- Column

Properties such as name ,add, tel

- Key

Record to search

Search and Cost

- Cost 1

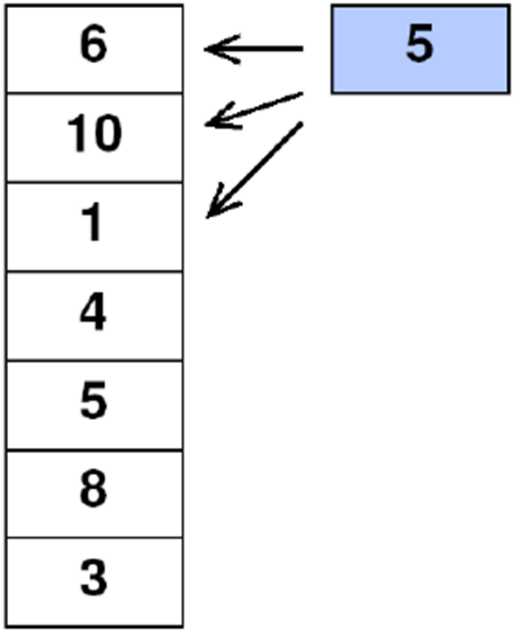
Cost of searching

- Cost 2

Cost of adding/removing data

Serial Search

- Search from the beginning of items
- No guarantee that the target must be available in the list
- Best case: find the wanted item by search once
- Worst case: find the wanted data after searching all items
- Average: (n+1)/2



Serial Search

- Search with the unsorted item

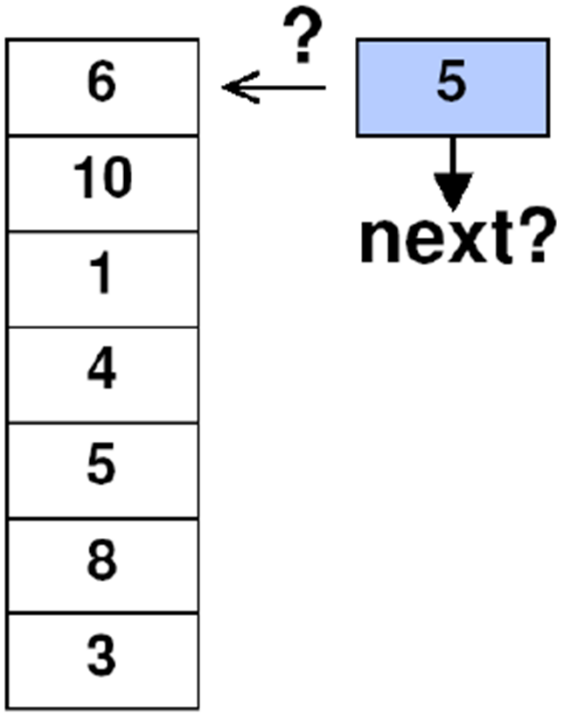
```
#define N 7
int data[N] = { 6, 10, 1, 4, 5, 8, 3 };
```

Serial Search

- Search from the 1st item
- Cost

Is it the same as the key?
Is it the last item of the list

- For one item, twice of comparison

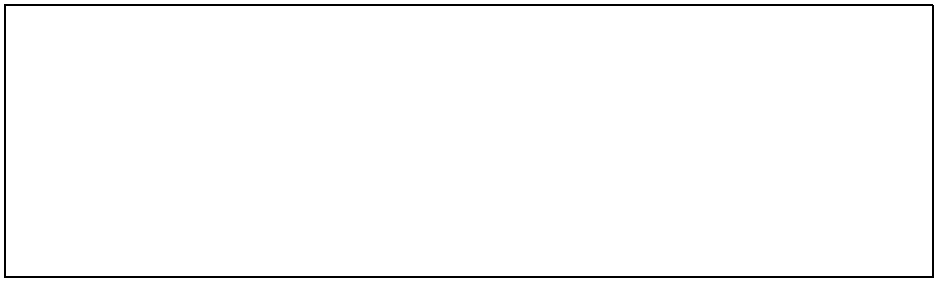


Serial Search

```
for( i=0; i<n; i++ ){
    if( data[i] == key ){
        break;
    }
}
```

Exercise

```
#include <stdio.h>
#define N 1000000
int main(){
    FILE *datafile;
    int i, size, key, data[N];
    char filename[20];
    printf( "data file: " );
    scanf( "%s", filename );
    datafile = fopen( filename, "r" );
    for( i=0; i<N; i++ ){
        if( fscanf(datafile, "%d", &data[i]) == EOF ){
            break;
        }
    }
    size = i;
```



```
  return 0;
}
```