C Programmierkurs

8. Stunde: Denken in Algorithmen

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Wie arbeitet der CSV-Parser von letzter Stunde?

CSV-Parser - Initialisierung

```
CsvParser_new(...);
```

↪ `*CsvParser`

zeigt auf alles was der Parser zum Funktionieren braucht

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```
typedef struct CsvParser {
  char *filePath_;
  char delimiter_;
  int firstLineIsHeader_;
  char *errMsg_;
  CsvRow *header_;
  FILE *fileHandler_;
  int fromString_;
  char *csvString_;
  int csvStringIter_;
} CsvParser;
```

CSV-Parser - Zeile für Zeile

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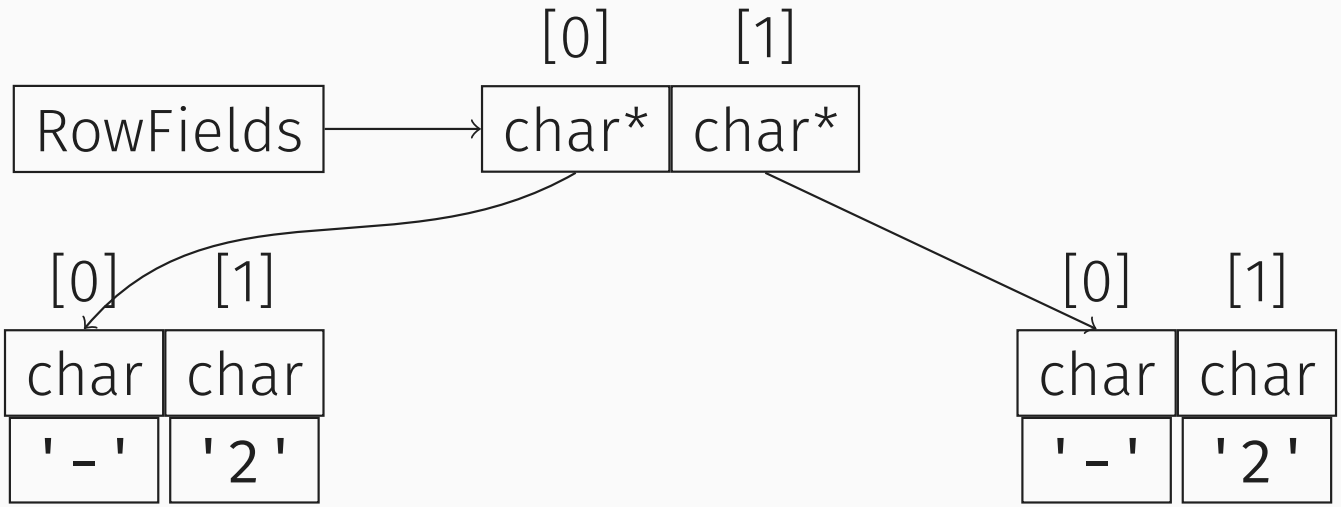
Die Zeile ist somit `"-2,-2"`.

Der Parser bricht diese nun an der Kommastelle auseinander:

`{"-2", "-2"}`

CSV-Parser - Speicherorganisation von Zeilen

```
char **RowFields = CsvParser_getFields(csvparser);
```



Shortest path problem

Dijkstra's Algorithm

```
1   function Dijkstra(Graph, source, target):
2     create vertex set Q
3     for each vertex v in Graph:           // Initialization
4       dist[v] ← INFINITY                  // Unknown distance from source to v
5       prev[v] ← UNDEFINED                 // Previous node in optimal path from source
6       add v to Q                          // All nodes initially in Q (unvisited nodes)
7       dist[source] ← 0                    // Distance from source to source
8
9       while Q is not empty:
10        u ← vertex in Q with min dist[u]  // Node with the least distance
11        if u == target:                   // will be selected first
12          break
13        remove u from Q
14        for each neighbor v of u:         // where v is still in Q.
15          alt ← dist[u] + length(u, v)
16          if alt < dist[v]:               // A shorter path to v has been found
17            dist[v] ← alt
18            prev[v] ← u
19
20    S ← empty sequence                    // Start building shortest path
21    u ← target
22    if prev[u] is defined or u = source:  // Do something only if the vertex is reachable
23      while u is defined:                 // Construct the shortest path with a stack S
24        insert u at the beginning of S    // Push the vertex onto the stack
25        u ← prev[u]
26
27    return S
```

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