Übungen zu Systemnahe Programmierung in C (SPiC) – Wintersemester 2019/2020

Übung 4

Benedict Herzog
Bernhard Heinloth
Tim Rheinfels

Lehrstuhl für Informatik 4
Friedrich-Alexander-Universität Erlangen-Nürnberg

Lehrstuhl für Verteilte Systeme
und Betriebssysteme

FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

TECHNISCHE FAKULTÄT

Vorstellung Aufgabe 2

Zeiger & Felder

Vertiefung: Zeiger

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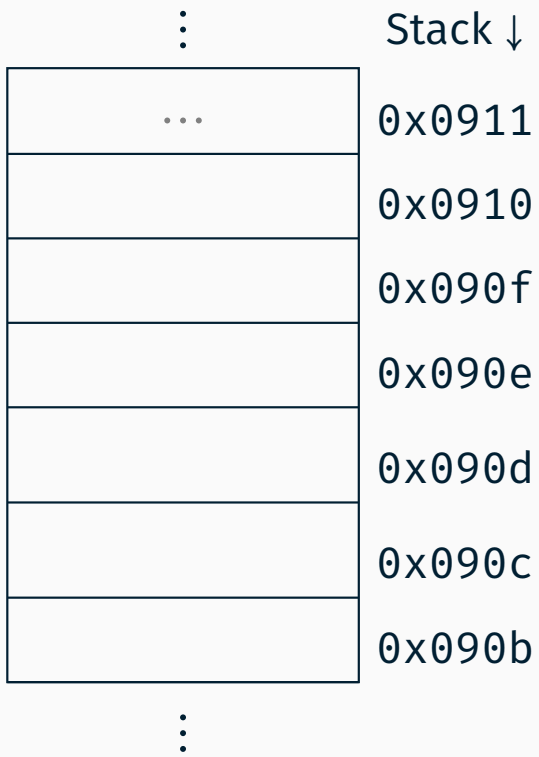

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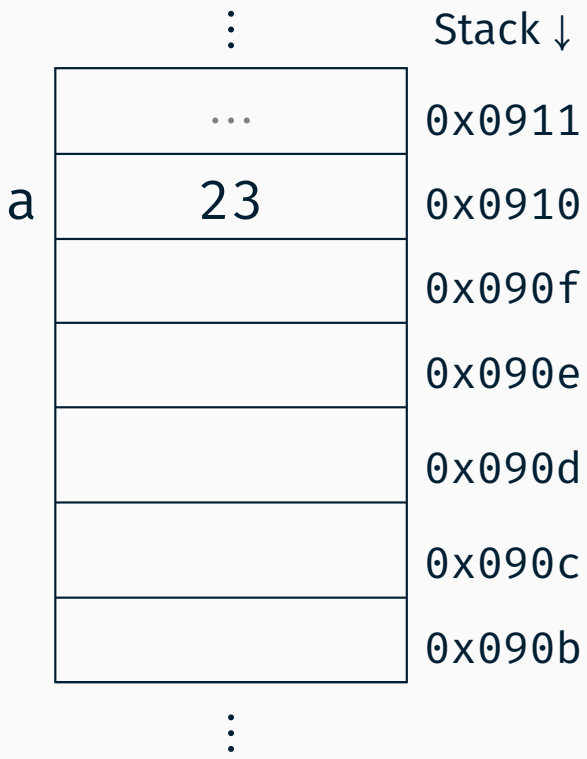

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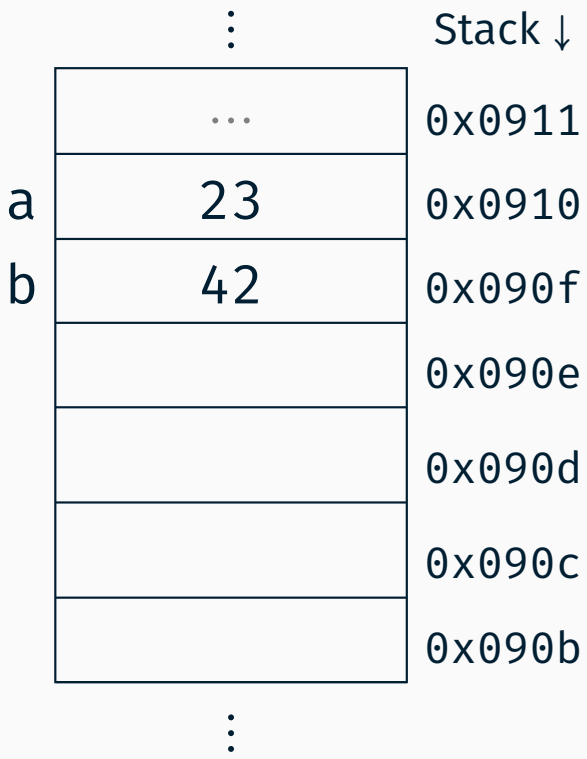

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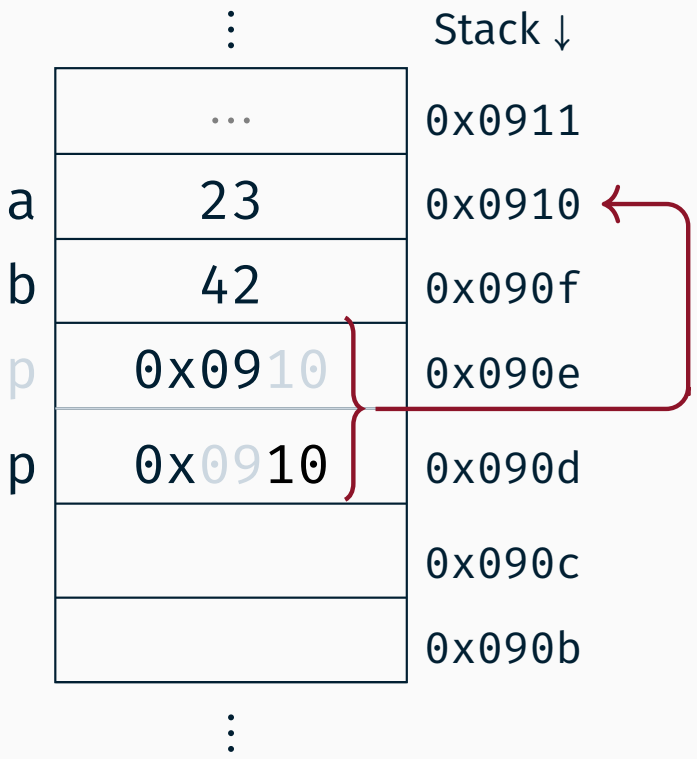

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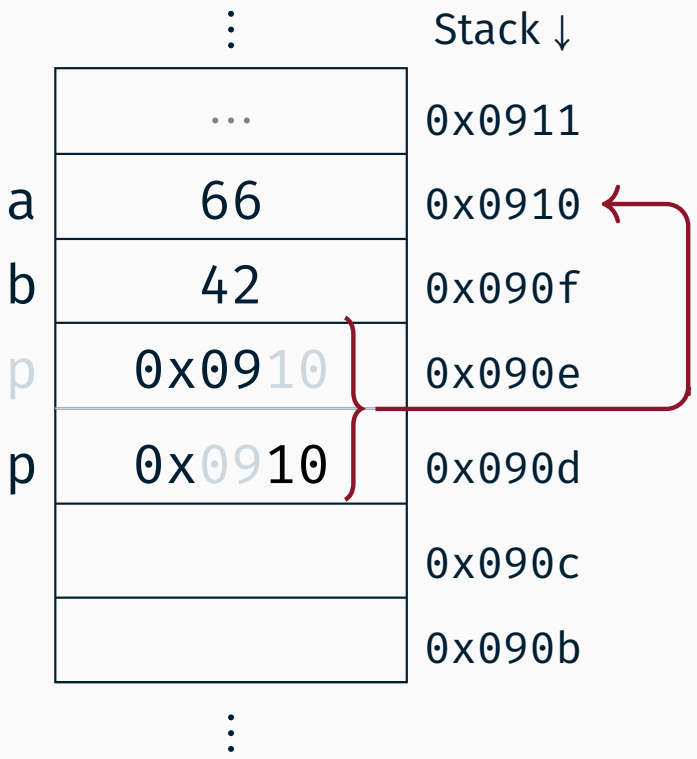

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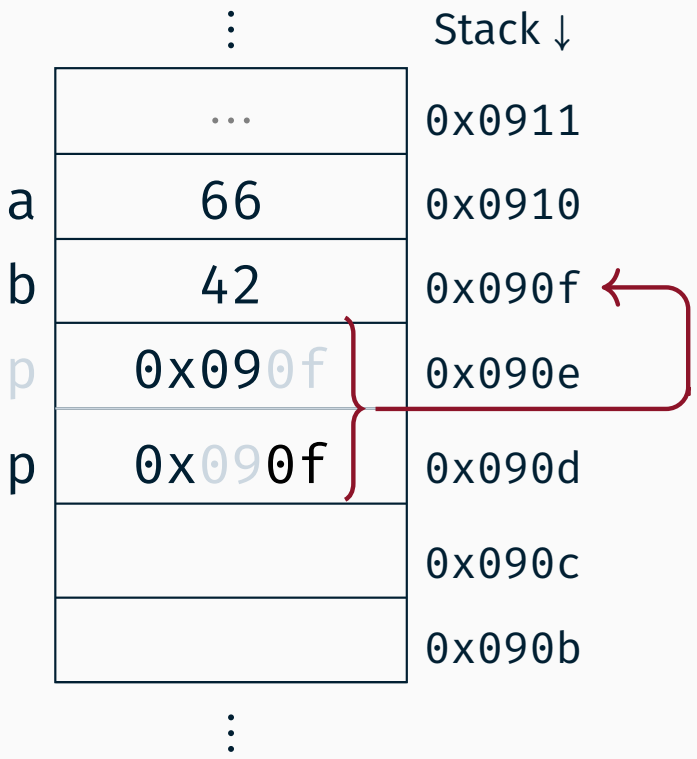

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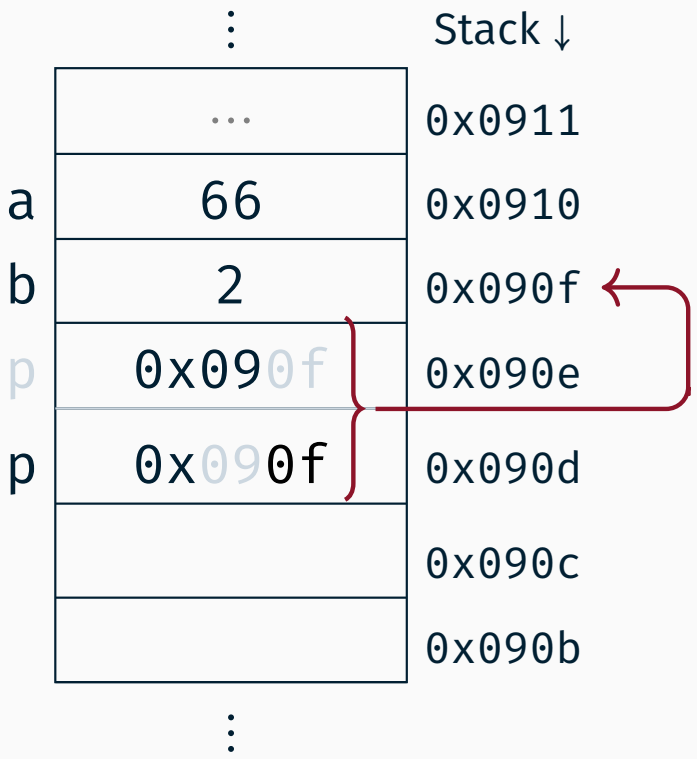

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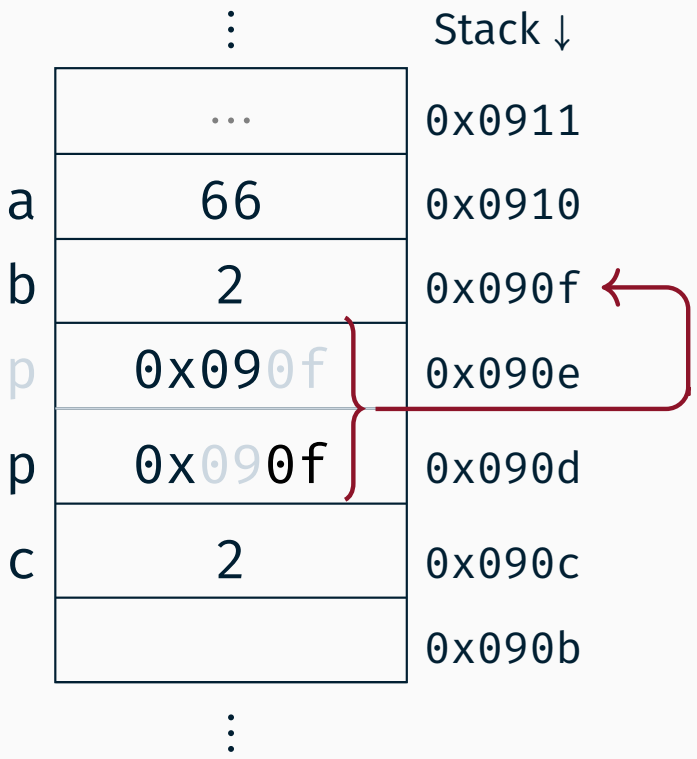

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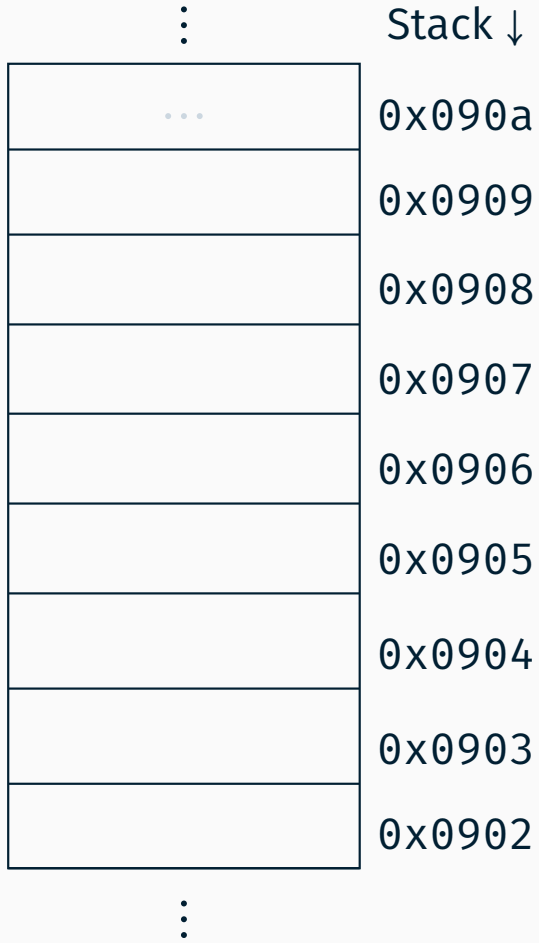

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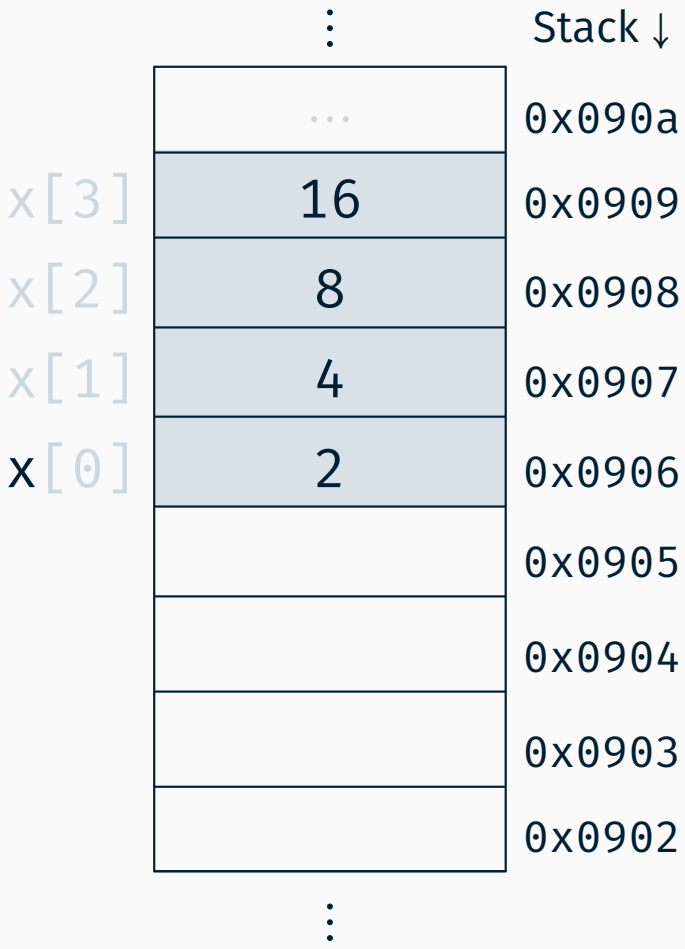

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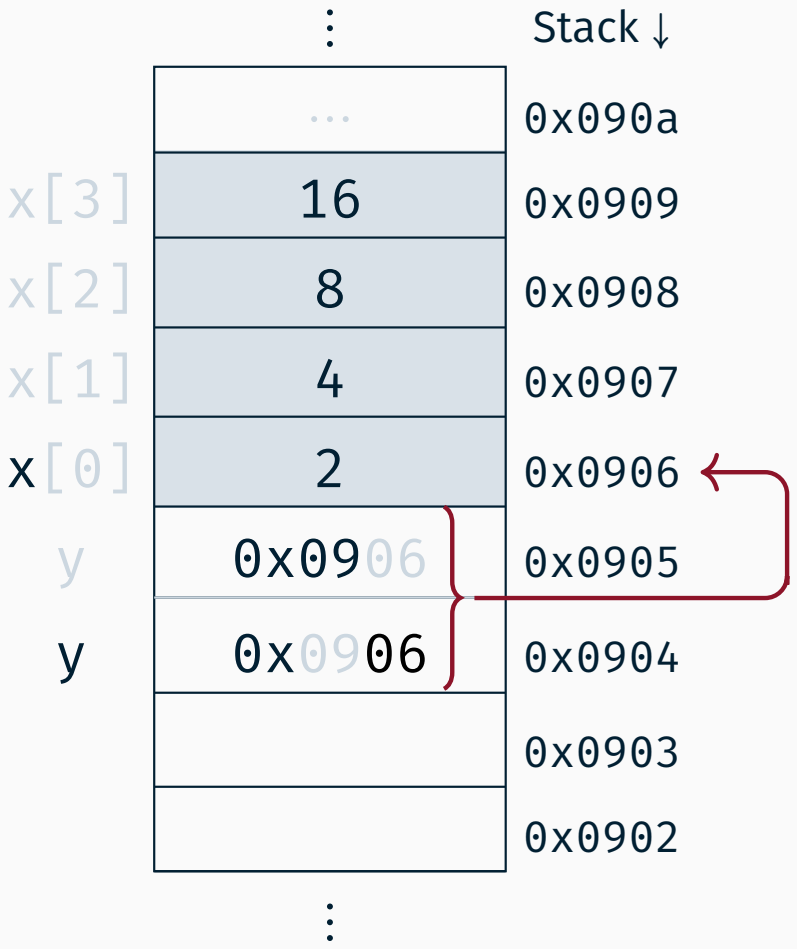

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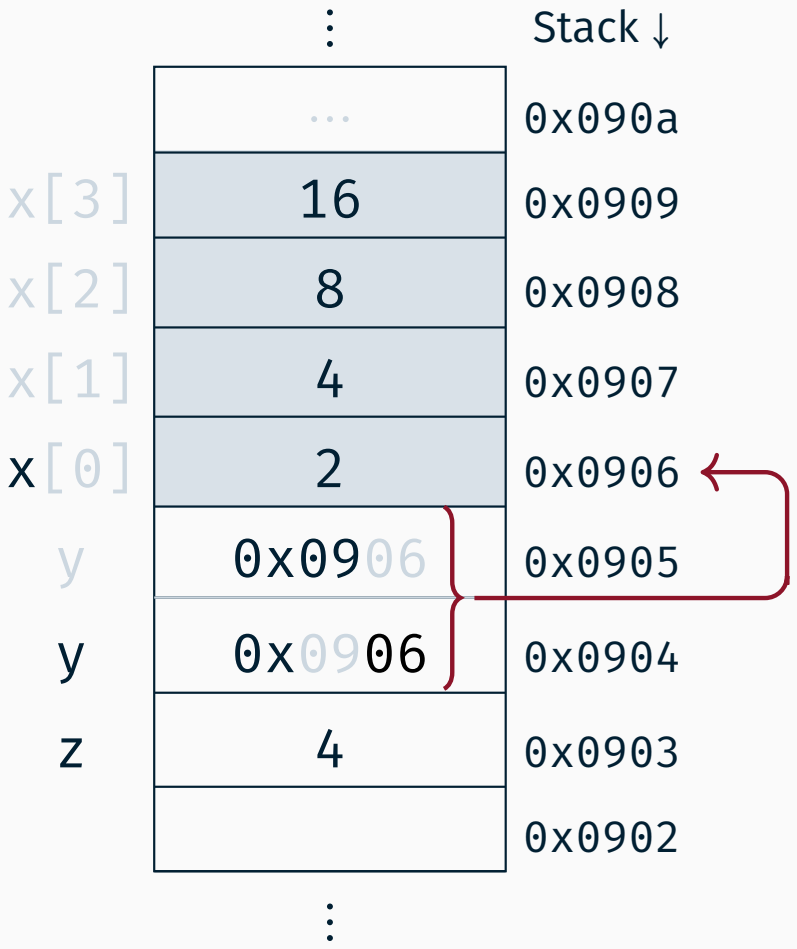

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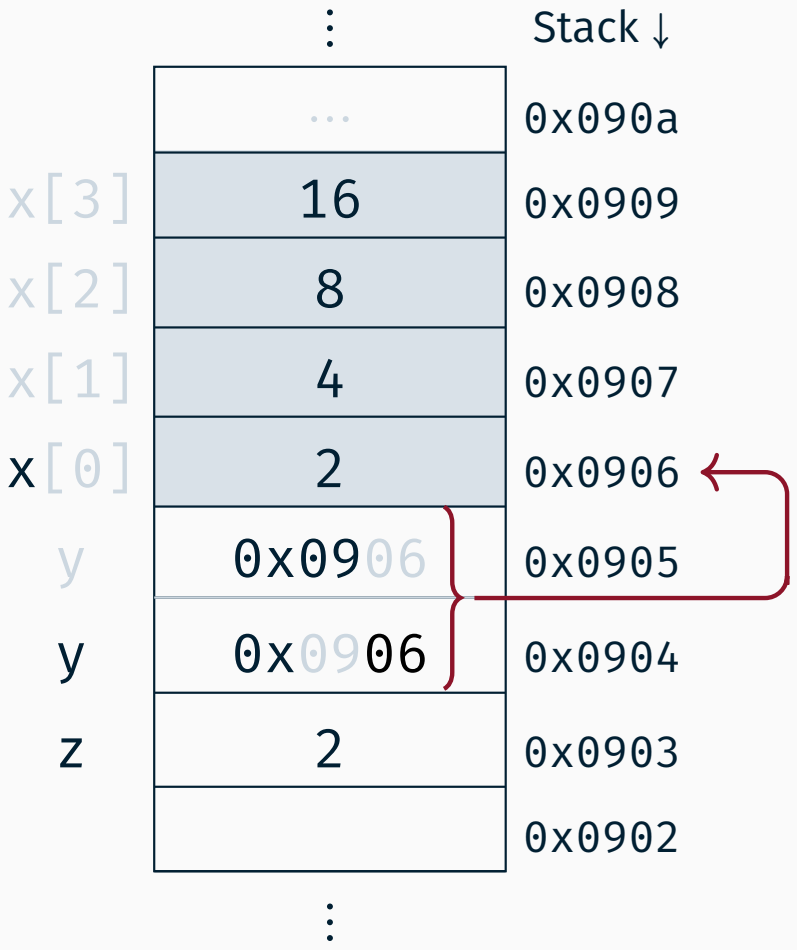

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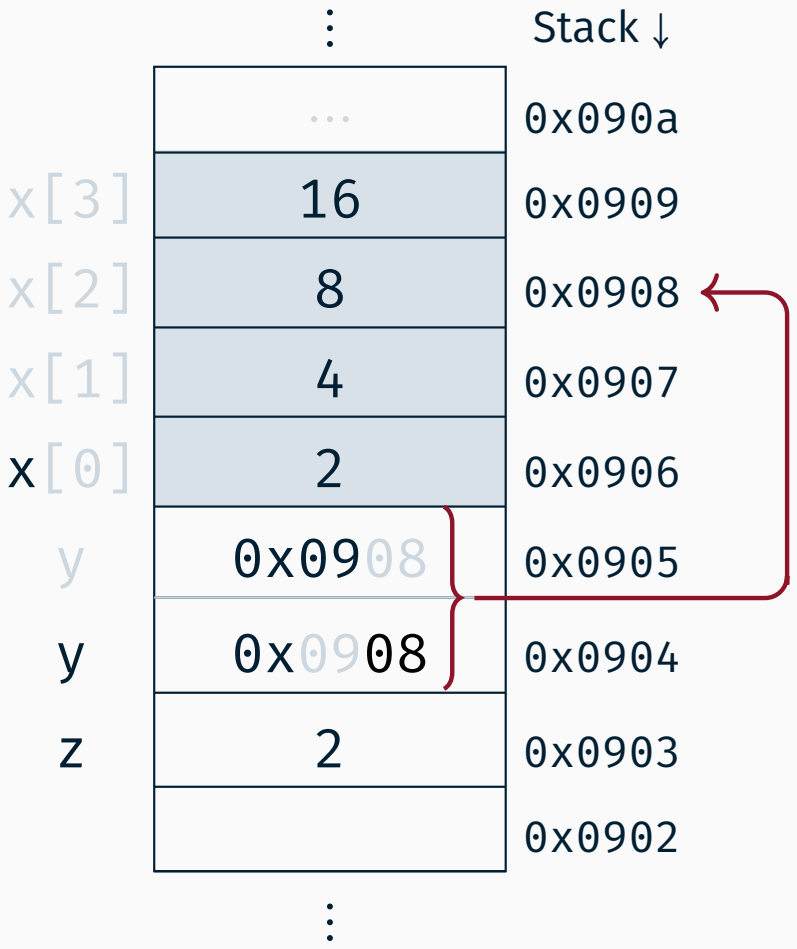

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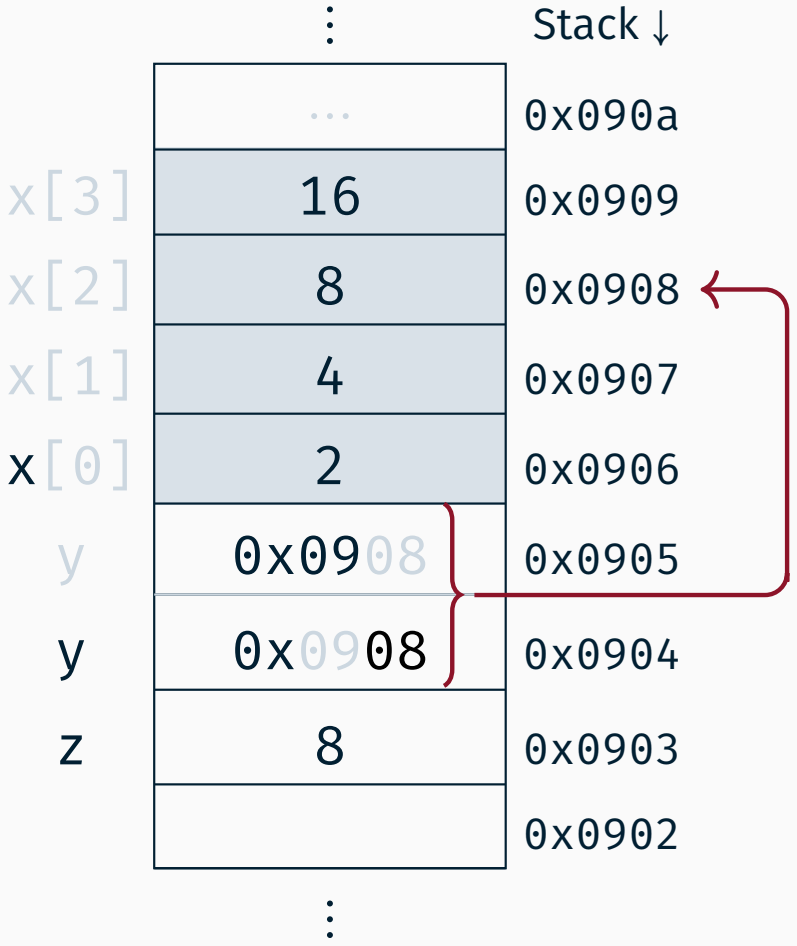

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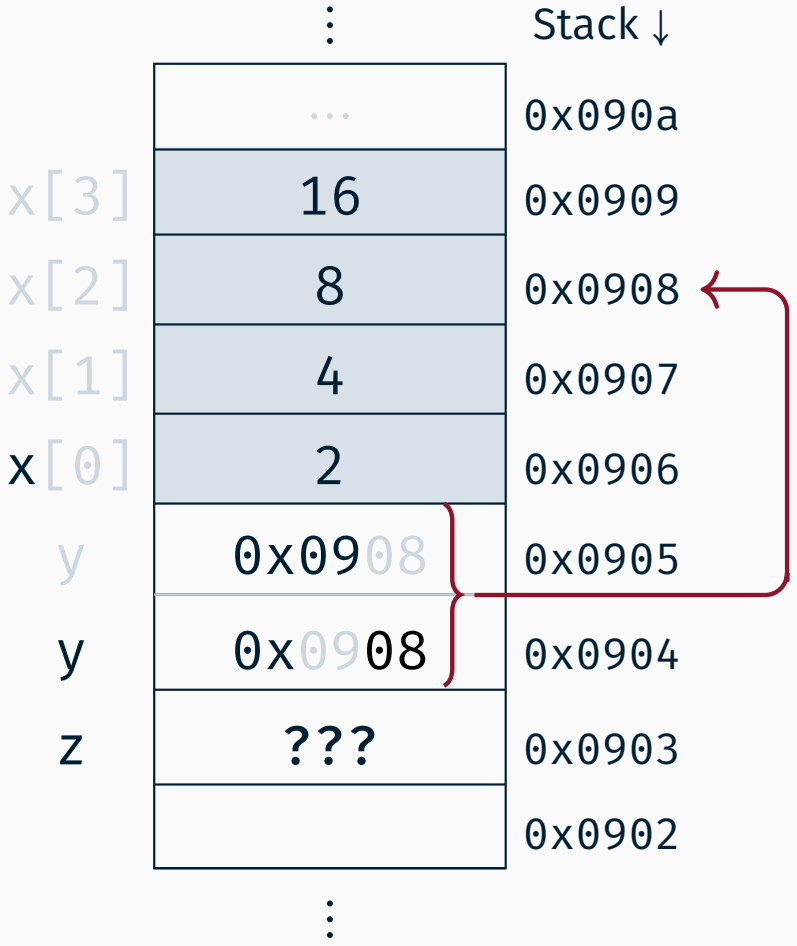

Hands-on: Zeiger

Hands-on: Strukturen, Felder & Zeiger

- Call-by-Value vs. Call-by-Reference
- Zeiger und Felder
- Zeigerarithmetik
- `struct` für GPS-Koordinaten
- Feld von GPS-Koordinaten
- Funktionszeiger

Kompilierbar für das SPiCboard (serielle Konsole) oder Linux

Quellcode:
`https://www4.cs.fau.de/Lehre/WS19/V_SPIC/Uebungen/material/pointer.c`

Hands-on: Laufschrift

Vertiefung: Strings

- `char`: Einzelnes Zeichen (z.B. `'a'`)
- String: Array von `char`s (z.B. `"Hello"`)
- In C: Letztes Zeichen eines Strings: `'\0'`

  ⇒ Speicherbedarf: strlen(s) + 1

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01 char *s = "World\n";
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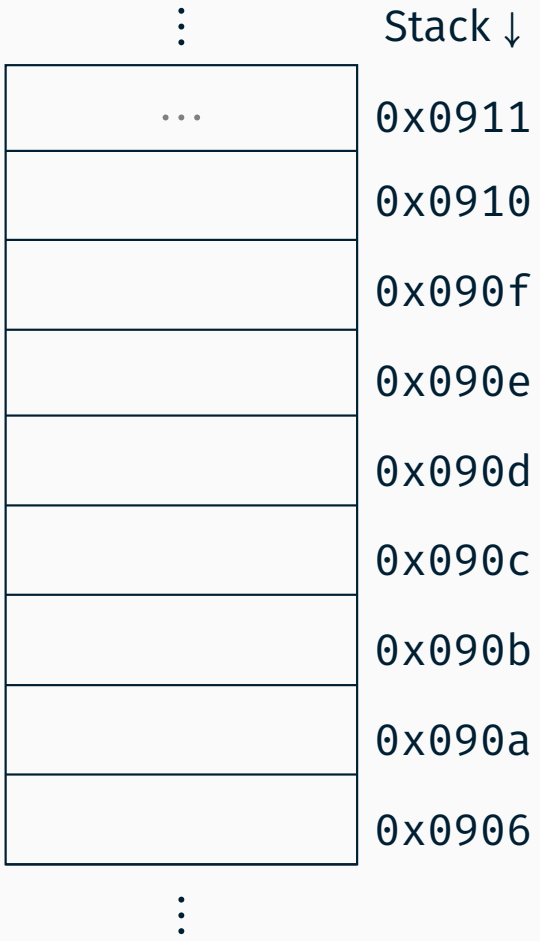

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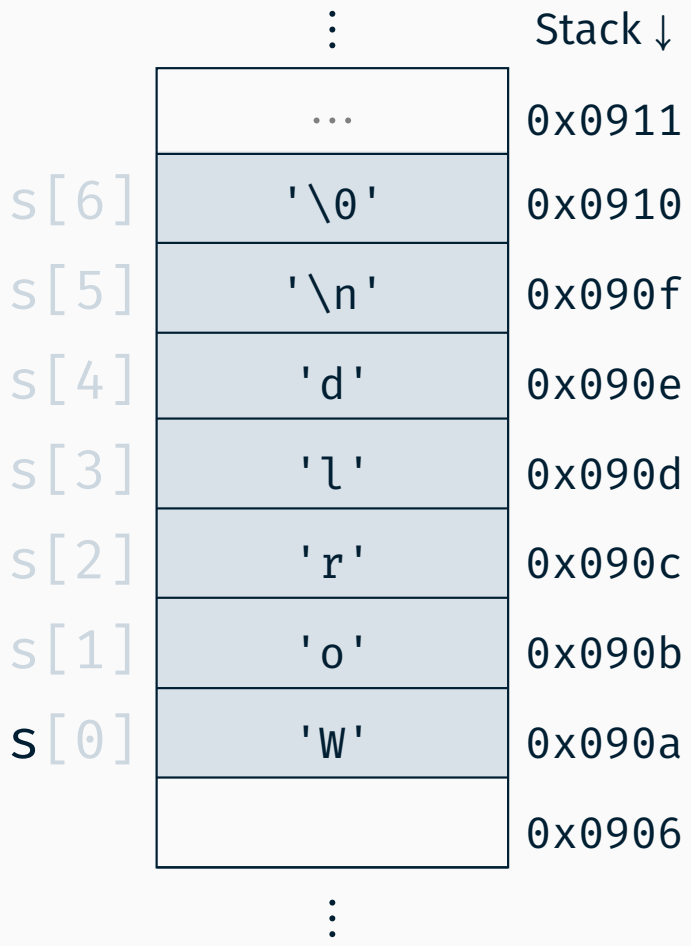

Hands-on: Laufschrift

- Funktionsweise:
  Schrittweises Anzeigen eines Textes auf der 7-Segment-Anzeige
- Lernziele:
  - Alarme & Schlafenlegen
  - Zeiger & Zeigerarithmetik
  - Zeichenfolgen in C
- Vorgehen:
  - Aktivieren eines wiederkehrenden Alarms (`sb_timer_setAlarm()`)
  - Optional: Manuelles Konfigurieren des Timers
  - Zusammensetzen des aktuellen Teilstrings
  - Ausgabe über 7-Segment-Anzeige
  - In Wartephasen Mikrocontroller in den Energiesparmodus versetzen