Function calls and Stack

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Programming Language Concepts
Lecture 7
31 January 2023

General layout of a program in memory

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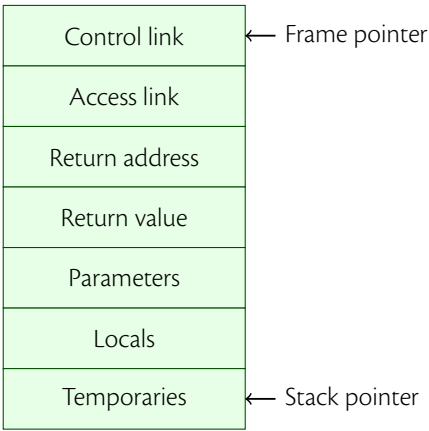
  - **Frame pointer** – points to the start of the topmost frame on stack
  - Data in topmost frame accessed via **offsets** from the frame pointer or stack pointer – offsets can computed at **compile time**

Activation record ...



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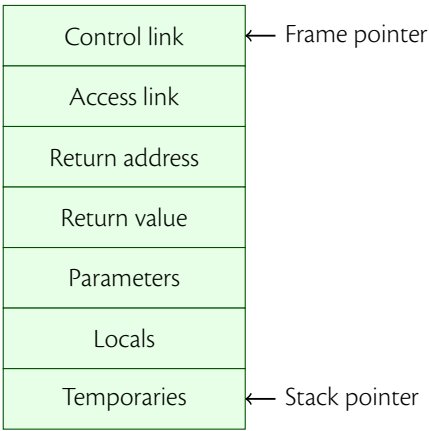

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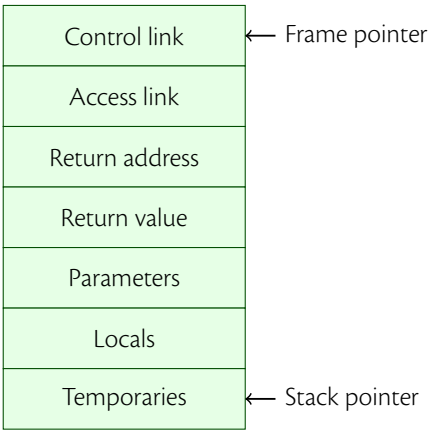

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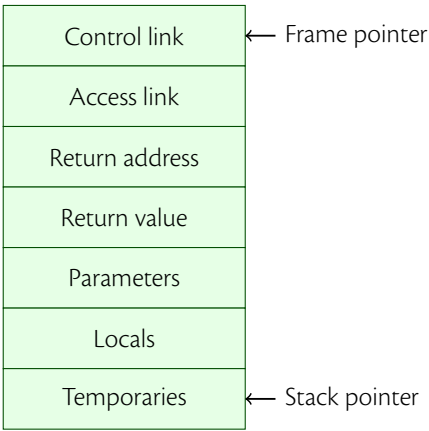

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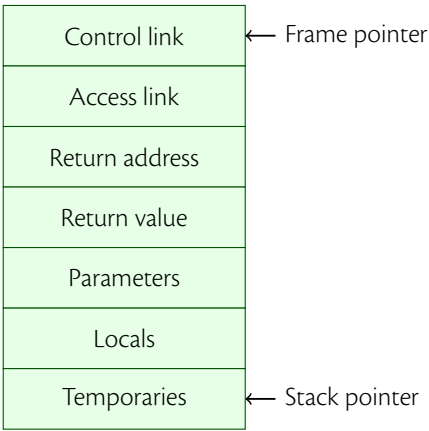

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- **Temporaries** are locations to store intermediate values in

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- Store parameters, locals, etc. on stack …SP will change but not FP!

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- If another function is called, we overwrite the locations occupied by the previous callee

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    int x = 0;
    int fib(int n) {
        if n ⩽ 1 then return n;
        else {
            x += 1;
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- Need a new kind of link – **access link**

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- When there is a call from `g`/`h` to `g`/`h`, set the access link of the callee to be the same as the access link of the caller!

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- To access x in h we go to the frame pointed to by access link, go to the frame pointed to by the access link **there**, and access x!