Metropolia University of Applied Sciences

Programming

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Memory

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Memory allocations in C

- So far we have been living on the mercy of the operating system completely
  - We have trusted that there WILL BE enough memory
  - We have trusted the the operating system, compiler or some other magical device or system will take care of the memory allocations for us
  - What does memory allocation mean?
  - What is memory?!

Computer memory

- Memory is a place where we can save information (bits)
- Arrangement, physical construction and access (R/W) is a course or a few of its own, so lets not get that far
- Computer memory can be understood as a row of boxes that can be used for storing data (cells that can hold bits)

Memory allocations in C

- So far, like said we have allocated memory by trusting that we have the space
  - int i = 100;
  - printf (sizeof(i));
- Here we trust and don't check that we have the memory available and we are at the mercy of the operating system

Memory access with malloc and free

- In some applications it is possible that we want to ensure that we are given some certain amount of memory
- We also might want to check that we actually have some memory available
- That can be done by function
  - malloc
- And to return memory back to OS
  - free

One big idea is linked lists with structures

- Structures can be used as linked lists

- Creation so, that the structure is given the next address of the structure untill that is the last structure
- So structure has a pointer (atleast one to forward) that has the address to the next structure, untill the structure is the last of the list that has a null pointer

Linked list idea:

- Linked list is sort of like a train, where one cart is connected to another untill the train ends and has no “child” cart (null pointer on the next pointer)