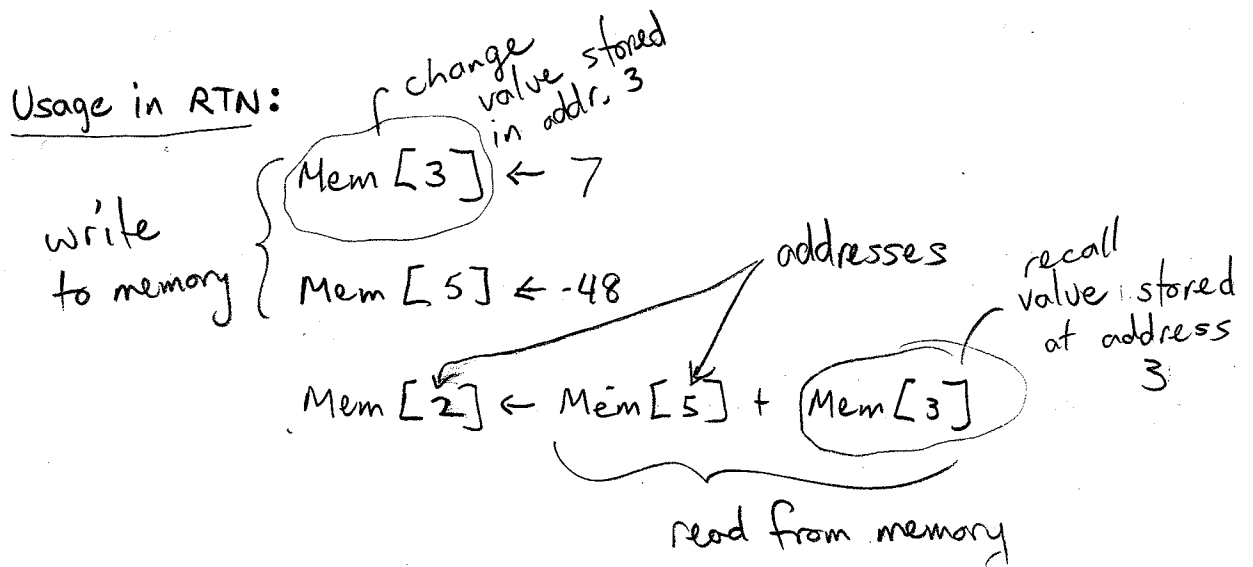
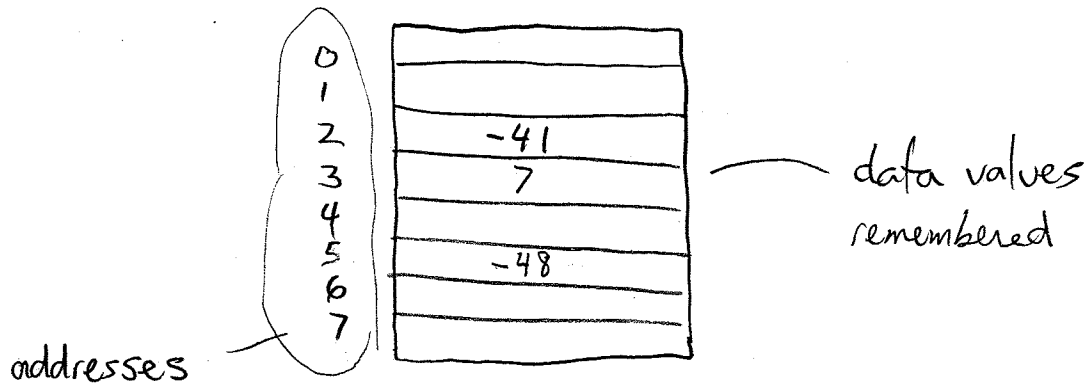


Memory - remembers a table of values

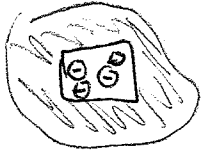


Purpose : hold lots of data, eg images, MP3
 register file is too small - it needs to stay small
 to remain very fast

Types :

- volatile - temporary - forgets when power removed
 eg: "RAM" - SRAM, DRAM, SDRAM (DDR, DDR2) etc.
 also registers, latches
- non-volatile - remembers even without power
 eg: Flash, EPROM, EEPROM
 also phase-change memory, MRAM, FeRAM, etc

How does non-volatile work?



Flash - traps electrons on a conductor ("gate").

that is surrounded on all sides by a good insulator

- inject / remove charge using very high voltages
 so electrons "jump the gap" like a spark

Phase-change - heat up small amount of material:

cools quickly - amorphous (like glass) - insulator

cools slowly - crystalline (like quartz) - conductor

How to build memory?

eg - just like the register file! (diagram below)

- most (large) memories use a more advanced row/column

encoding method (lower overhead per bit)

