- Easy construction hardware and compilers.
- Maximizing performance.
- Minimizing cost.
- Minimizing power.

The stored-program concept, in which a both programs and data can be stored in memory as numbers.

- There is exactly one operation.
- It has exactly three operands.

1. Simplicity favors regularity.
2. Smaller is faster.
3.

The natural unit of data used by a particular computer design. It is usually the size of addressability of the system, meaning the largest address is two raised to the power of the word size minus one.

- The farther the signal must travel to reach a register, the slower a cycle may become.
- Addressing large numbers is constrained by the size of the instruction.
- Energy conservation.

With data transfer instructions - instructions that move data from memory to the registers (*loads*) and back (*stores*).

ARM uses byte-addressing. Hence its *alignment restriction* requires that addresses must be in multiples of the word size. Some other architectures uses word-addressing, in which case addresses are simply nonnegative integers.

Big-endian systems use the leftmost byte as the word's address.
Little-endian systems like ARM use the rightmost byte.

The process of moving program variables that have no space in registers into memory. Compilers will attempt to spill variables that are least likely to be needed again in the near future.

- Memory takes longer to access.
- Registers can be accessed and operated on in one instruction. Memory loads require instructions that do no computation on the loaded values.
- Memory takes more energy.