Hardware Comparison

- Memory organization, size
- Registers size, count
- Formats
  - data integer, character, floating point
  - instruction fixed length, variable length
  - Address modes count, types
- Instruction set organization, simple, complex
- Input and Output control types

General Electric
GE635

- **Memory**

  36 bit words word addresses

  256k words (1 megabytes) real memory

- **Registers**

  special purpose registers

  A / Q accumulator 72 bits

  X0 - X7 index registers 18 bits

- **Data Formats**

  integer 36 bit (2's complement)

  floating point [1-7-1-27]

  character 6 bit BCD - 9 bit ASCII

- **Instruction Formats**

  1 fixed length

  address, opcode, index flag, tag flags

- **Addressing Modes**

  Direct Index

  PC relative Indirect

  Upper / lower

- **Instruction Set**

  Load and Store register

  Integer arithmetic - A register and memory

  Conditional jump; subroutine jump; jump

  Add One to Storage

- **Input and Output**

  Input - Output Multiplexor

  I / O Channels Shared Memory

MIPS
R2000/3000

- **Memory**

  8 bit bytes byte addresses

  4-bytes = word

  4096 megabytes virtual memory

- **Registers**

  32 general purpose registers

  r0 = always zero

  r1, r26, r27 reserved for system software

  r2, r3 function results

  r4 - r7 routine arguments

  r28 - r30 pointers r31 return address

- **Data Formats**

  integer (2's complement)

  floating point [1-8-23] IEEE 754

  character strings (ASCII)

- **Instruction Formats**

  3 fixed length

  opcode, regS, regT, regD, shift, function

  opcode, regS, regT, address/immediate value

  opcode, address

- **Addressing Modes**

  Register Immediate

  Base PC Relative

- **Instruction Set**

  Arithmetic

  Register Load and Store

  Conditional Branch

  Unconditional Jump

- **Input and Output**

  I/O Device controllers

  Shared main memory location