Review Problem 3

In assembly, compute the average of positive values X0, X1, X2, X3, X4, and put into X10.

There is no SINV, since 4/3.

// Flush from SINV
AD0 X10, X10,X9
AD0 X4, X2,X3 // Parallel
AD0 X10, X9,X1 // Parallel
AD0 X10, X9,X0 // Parallel

LSR X10, X10, #2
AD0 X10, X10,X3
AD0 X10, X10,X2
AD0 X10, X9,X1

S: Enter 6: 6.55
Most commonly used are substractions; so we have a synonym: CMP

Operations that set the flag register contents:

- **CARRY**: was the carry-out true?
- **OVERFLOW**: was result magnitude too big to fit into 64-bit register?
- **ZERO**: was result 0?
- **NEGATIVE**: was result a negative number?

Flag Register holds information about result of recent math operation

**Flags/Condition Codes**
add: x2, x0, x1  
   m = a + b  
   if (a == b)
      m = a + 3
   else
      m = a + q

branch if a = b
set flags

Cmp X0, X1
X0 = a, X1 = b, X2 = c
X0 = a, X1 = b
X0 = a, X1 = b
X0 = a, X1 = b

Control Flow
Cond1: BR X30  
Cond2: CBZ (i = 0)  
Cond3: CBNZ (i = 0)

Conditional Branches - GOTO different next Instruction if Condition is true
Goto to address in X30: PC = value of X30
Goto to instruction labeled with "START" Table

Unconditional Branch - GOTO different next Instruction
Goto to instruction labeled with "DONE" Table
Loop Example

// Compute the sum of the values 0..N-1

for (int i = 0; i < N; i++)
    sum += X[i];

sum = 0;