NestedLoops

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1 Nested loops

```c
int sum = 0;
int i = 0;
int j = 0;
for(i = 0 ; i < 10 ; i++)
    for(j = 0 ; j < 10 ; j++)
        sum = sum + i + j;
```

First we translate the for loops into while loops to be delt with easier

```c
int sum = 0;
int i = 0
while (i < 10)
{
    int j = 0;
    while (j < 10)
    {
        sum = sum + i + j;
        j++;
    }
    i++;
}
```

```asm
# Assume all regs are zero by default
# $s1 -> i
# $s2 -> j

addi $s3, $s3 10

first_loop:
    and $s2, $s2, $zero         # j = 0
    second_loop:
        add $t0, $s1, $s2       # Temp reg $t0 = i + j
        add $s0, $s0, $t1       # sum += i + j
        addi $s2, $s2, 1        # j++
        bne $s2, $s3, second_loop

    addi $s1, $s1, 1            # i++
```

```
        bne $s1, $s3, first_loop
        j Exit

Exit:
        ...
```