Exercises for Datorarkitektur

1 Exercise 3.4

Assume `$s0` contains `a`, `$s1` contains `b` and `$s2` contains c produce the equivalent MIPS code for the following C statement:

```
a = b + 100;
```

2 Exercise 3.8

Assume that `$s0` contains the start address of the array `x[]` and `$s1` contains the variable `c` what is the MIPS for the following instruction

```
x[10] = x[11] + c;
```

3 Exercise 3.1

Add comments to the following MIPS code and describe in one sentence what it computes. Assume that `$a0` contains the integer variable `n` and that `$v0` is used for the answer.

```
begin:  addi $t0,$zero, 0
        addi $t1,$zero,1
loop:   slt  $t2,$a0,$t1
        bne  $t2,$zero,finish
        add  $t0,$t0,$t1
        addi $t1,$t1,2
        j    loop
finish: add $v0,$t0,$zero
```

4 Exercise 3.9

Assume that `$s6` contains the address of `save[0]`, `i` is in the register `$s3` , `j` is in `$s4` and `k` is in `$s5` produce code for the following:

```
while (save[i] == k)
  i = i + j;
```

If you're unsure about the what the C code does ask me!

When you have written the code rewrite it so it uses less instructions.

5 Exercise 3.26

Exercise implement the following function:

```
  int fib(int n){
    if (n==0)
     return 0;
    else if (n==1)
     return 1;
    else
     return fib(n-1) + fib(n-2);
}
```

6 Exercise 3.27

Now implement the following more efficient version:

```
  int fib_iter (int a, int b , int count) {
   if (count == 0)
     return b;
   else
    return fib_iter(a+b, a, count -1);
}
```