Exercises for week 7

1. Consider the following code:

```
int b;
int y;

int main()
{
b=5;
y=11;
if b>1 {b = f1(b,b-1)};
return 0
};

int f1(int y, int z)
{while b>0
{ if y>12 {b = (y-1)*f1(y-1,y)} else
              {if y>9 {y=y-1; b=5} else {b=5; y=y-1}
              }
};
y=y-1; return b
}
```

Consider a configuration c where the body of $f1$ is executed for the first time. There are three occurrences of the statement $y = y - 1$ (which are the border words of three different program rest nodes). What is the program rest after

- the first occurrence, (15 points)
- the second occurrence, (15 points)
- the third occurrence (15 points)

of statement $y = y - 1$?

2. Consider the following program:

```
typedef int[6] vec;
vec x;
int z;
int y;

int main()
{
z=5; y=3;
y = f(z);
return 0
};

int f(int y)
{y = z +  x[z];
return y
}
```

What MIPS code is generated for the right hand side of the assignment in the body of f? (25 points)

3. Consider the following program:

```
typedef int[6] vec;
vec x;
int z;
int y;

int main()
{
z=7;
while z >0 { z = z - 2 };
return z
}
```

What MIPS code is generated for the while statement? (30 points)