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Foundations of Data Science
Exercise sheet 9

Exercise 4

a)

```
function MAP(value)
        max=INTEGER.MIN_VALUE
        for all v in value do
                if(v>max)
                            max=v
        emit(1,max)

function REDUCE(key,values)
        max=INTEGER.MIN_VALUE
        for all v in values do
                if(v>max)
                            max=v
        emit(max)
```

b)

```
function MAP(value)
        for all v in value do
                emit(1,v)


function REDUCE(key,values)
        sum=0
        n=0
        for all v in values do
                sum=sum+v
                n=n+1
        a=sum/n
        emit(1,a)
```

c)

```
function MAP(value)
        for all v in value do
                emit(v,1)


function REDUCE(key,values)
        emit(1,key)
```

d)

```
function MAP(value)
        for all v in value do
                emit(v,1)


function REDUCE(keys,values)
        cnt=0
        for all k in values do
                cnt=cnt+1
        emit(1,cnt)
```