Matrix vector multiplication:

Now Suppose we want to compute Matrix vector multiplication. Suppose A is a matrix of size m x n and B is a vector of size n x 1. So the result C will be of size m x 1.

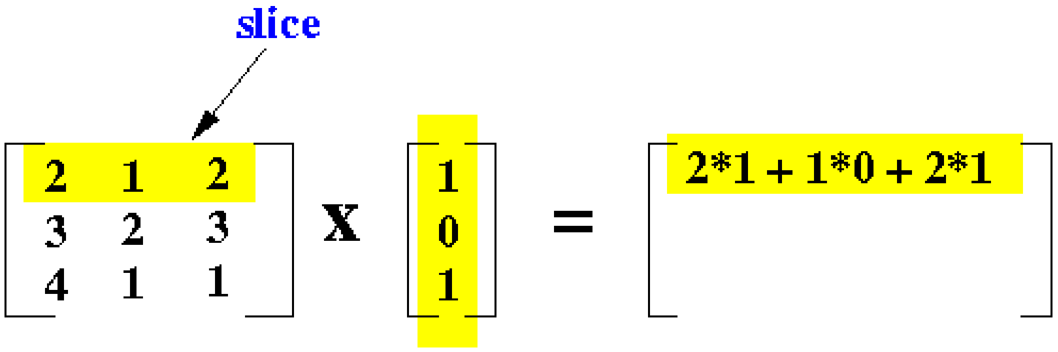
mathodology:

we can do the multiplication in sequential method in the following way

```
loop i from 0 to m-1
        loop k from 0 to n-1
                compute C[i][0] += A[i][k]*B[k][0];
        end loop
end loop
```

parallelization:

matrix vector multiplication can be visualized as m different dot products of two vectors each of size n and there are m different dot products as the size of the matrix is of m x n .



Here each of the slice is treated as a different vectors. So the matrix a can be treated as a collelction of m different row vectors of size n. product of the matrix with the vector is nothing but dot product of the row vectors in the matrix(ie. Slice in the picture) and the vector n and storing the result in the respective location of another vector C.

So to do this in parallel on can divide the matrix into sub matrices with size (m/p, n) , p being the number of the processes. And then compute m/p dot products locally (can be parallelized) and storing at the respective location.