1. C Program:

This program implements multiplication of a matrix M and a vector A. It is also in the file MultiplyMatrixVector.c:

```
//
//  MultiplyMatrixVector.c
//  Created by Robert Plant on 10/7/14

#include <stdio.h>

void next_rank(double *m, /*input */
               double *r, /*input and output */
               int n) {
    double temp[n]; // For storing the answers...
    // index declarations
    int i = 0;
    int j = 0;

    for (i = 0; i < n ; i++) {
        temp[i] = 0;  // initialize...
        for (j=0; j< n; j++) {
            double Val = (m[j]) * r[j];
            temp[i] += Val;
        }
        // Store the result
        // increment m pointer to point to next row
        // m += sizeof(double [n]);
        m += n;
    }

    // Store all results back into r vector:
    for (j=0; j<n ; j++) {
        r[j]=temp[j];
    }
}

int main(int argc, const char * argv[]) {
    // Declare and define a matrix
    double M[][4] = {{1,2,3,4},{5,6,7,8},{9,10,11,12},
{13,14,15,16}};
    double V[4]={1.5,2.5,3.5,4.5};

    // Multiply matrix x vector
    next_rank(M[0], V,4);
    // index declaration
    int val = 0;
```

```
        for (val = 0; val < 4; val++) {
           printf("Val[%d] = %.2f \n",val+1,V[val]);
        }

        return 0;
    }
```

2. Embedded Hardware Discovery:

I found an unused 2-wire modem/wireless router, opened it up and took a photo of the board:

The main processor is a large chip labelled "**2Wire Ates**". According to *hackingbitbusinesshub.com* this chip has a TriMedia TM3260 core provided by NXP. If that is true, then it is a 32bit RISC processor.

Clock frequency is up to 266MHz
Data cache size = 16 KB
Instruction cache size = 64 KB

The NXP chip is supplied by a **28MHz ECERA oscillator** on the back of the board. It is also supported by a **256Mb DDR SDRAM** (**Samsung** K4H561638J) as well as a **128Mbit NAND Flash** (**ST** NAND128W3A28N6.)

There is also an **Atheros** AR2413A **Wireless LAN driver** for WIFI. This is supported by a **32kb I²C EEPROM** (**ST** 24C32WP).

There is also a **Marvell 10/100 Ethernet switch** (88E6061)