

Michael Kepple  
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CS 5520 - Operating Systems  
Lab 09 Deliverable

#1 - **Server Hello World** - modify the IS so that the F9 key displays "Hello, World!" on the console.

What I did:

- + Added hook\_entry to hooks[] in usr/src/servers/is/dmp.c.
- + Added hw\_dmp() function to usr/src/servers/is/dmp\_kernel.c
- + Added function prototype to usr/src/servers/is/proto.h.
- + make install
- + service down is
- + service up /sbin/is

Diff output for dmp.c:

```
25a26
>      { F9,    hw_dmp, "Print Hello, World" },
```

Diff output for dmp\_kernel.c:

```
59a60,64
> void hw_dmp()
> {
>     printf("Hello, World!");
> }
>
```

Diff output for proto.h:

```
12a13
> void hw_dmp(void);
```

#2 - **Kernel Table** - create a 3x3 matrix within the kernel. It must be dynamically initialized.

What I did:

- + added matrix declaration to usr/src/kernel/glo.h
- + added matrix definition to usr/src/kernel/main.c
- + make install
- + make mdboot from usr/src/releasetools

Diff output for glo.h:

```
26a27
> EXTERN int matrix[3][3];
```

Diff output for main.c:

```
39a40
> static void printMatrix(void);
62a64
>     printMatrix();
312a315,324
> static void printMatrix(void)
> {
>     int i, j;
>     for (i=0; i<3; i++)
>         for (j=0; j<3; j++)
>         {
>             matrix[i][j] = i+j;
>             printf("Matrix[%d][%d]: %d\n", i, j, matrix[i][j]);
>         }
> }
```

#3 - **Display Kernel Table from the Kernel** - display the table created in the

previous exercise by simply outputting from the same area of the kernel as the instantiated array.

What I did:

+ Printed out the Matrix as it was instantiated - see above.

Diff output for main.c:

```
39a40
> static void printMatrix(void);
62a64
>     printMatrix();
312a315,324
> static void printMatrix(void)
> {
>     int i, j;
>     for (i=0; i<3; i++)
>         for (j=0; j<3; j++)
>         {
>             matrix[i][j] = i+j;
>             printf("Matrix[%d][%d]: %d\n", i, j, matrix[i][j]);
>         }
> }
```

#### #4 - Display Kernel Table Using the IS - Again display the table created earlier.

This time, however, use SF7 ("shift F7") to request that the array be displayed.

What I did:

+ added a get\_matrix(dst) definition in usr/src/include/minix/syslib.h  
 + added a GET\_MATRIX message in usr/src/include/minix/com.h  
 + edited usr/src/kernel/do\_getinfo.c to **return** the matrix when we ask.  
 + added hook\_entry to hooks[] in usr/src/servers/is/dmp.c  
 + added matrix\_dmp() function to usr/src/servers/is/dmp\_kernel.c  
 + added function prototype to usr/src/servers/is/proto.h  
 + make install from usr/src or all individual folders, make hdbboot from  
 usr/src/releasetools  
 + shutdown -r (reboot)

Diff output for syslib.h:

```
159a160
> # define sys_getmatrix(dst)         sys_getinfo(GET_MATRIX, dst, 0, 0, 0)
```

Diff output for com.h:

```
474a475
> #     define GET_MATRIX            25        /* get matrix initialized during boot */
```

Diff output for do\_getinfo.c:

```
52a53,57
>     case GET_MATRIX: {
>         length = 9*sizeof(int);
>         src)vir = (vir_bytes) &matrix;
>         break;
>     }
```

Diff output for dmp.c:

```
33a34
>     { SF7,     matrix_dmp, "Print out matrix from kernel" },
```

Diff output for dmp\_kernel.c:

```
64a65,74
> void matrix_dmp()
> {
>     int tempMatrix[3][3];
```

```
> sys_getmatrix(&tempMatrix);
> int i,j;
> for (i=0; i<3; i++)
>     for (j=0; j<3; j++)
>         printf("Matrix[%d][%d]: %d\n", i,j,tempMatrix[i][j]);
> }
>
```

Diff output for proto.h:

13a14

```
> void matrix_dmp(void);
```