```
ï»¿UCR EE/CS 120B Lab 22 − Introduction to C and RIMS
Name: Joshua DeForest−Williams jdefo002@ucr.edu
Partner: Ariana DeJaco adeja001@ucr.edu


Contributions: Joshua (50%), Ariana (50%). We both equally worked on this lab. A
riana did most of the typing for day 1, while I did most of the typing for day 2
. However we thoroughly discussed the solutions to each excise completed.


Pre−lab −− no prelab for this lab


Introductory material âM−^@M−^S There were no problems, with this lab, however i
t was very time consuming.

Day 1

Exercise 1 −− No issues with this exercise.
Exercise 2 −− No issues with this exercise.
Exercise 3 −− No issues with this exercise.
Exercise 4 −− No issues with this exercise.
Exercise 5 −− No issues with this exercise.

Day 2
Exercise 1 −− No issues with this exercise.
Exercise 2 −− No issues with this exercise.
```

```
1  /*      jdefo002_lab0_part1 − 4/1/13
2   *      Name & E−mail: Josuha DeForest−Williams jdefo002@ucr.edu
3   *      CS Login: Jdefo002
4   *      Partner(s) Name & E−mail: Ariana Dejaco adeja001@ucr.edu
5   *      Lab Section: 22
6   *      Assignment: Lab #1  Exercise # Chapter 1 Try 1
7   *      Exercise Description:
8   *      Run the above program. The programâM−^@M−^Ys behavior should appear iden
    tical to the earlier program having just âM−^@M−^\B = A;âM−^@M−^].
9   *      I acknowledge all content contained herein, excluding template or exampl
    e
10  *      code, is my own original work.
11  */
12 #include "RIMS.h"
13
14 void main() {
15 while (1) {
16 B0 = A0;
17 B1 = A1;
18 B2 = A2;
19 B3 = A3;
20 B4 = A4;
21 B5 = A5;
22 B6 = A6;
23 B7 = A7;
24 }
25 }
```

```
1  /*      jdefo002_lab0_part2.c − 4/1/13
2   *      Name & E−mail: Josuha DeForest−Williams jdefo002@ucr.edu
3   *      CS Login: Jdefo002
4   *      Partner(s) Name & E−mail: Ariana Dejaco adeja001@ucr.edu
5   *      Lab Section: 22
6   *      Assignment: Lab #0  Exercise # Chapter 2 Try 6
7   *      Exercise Description:
8   *      Run the above program. Note that B gets assigned 203 (in binary).
9   *      I acknowledge all content contained herein, excluding template or exampl
    e
10  *      code, is my own original work.
11  */
12 #include "RIMS.h"
13 unsigned char x;
14
15 void main() {
16 while (1) {
17 x = 203;
18 B = x;
19 }
20 }
```

```
1  /*      jdefo002_lab0_part3.c − 4/1/13
2   *      Name & E−mail: Josuha DeForest−Williams jdefo002@ucr.edu
3   *      CS Login: Jdefo002
4   *      Partner(s) Name & E−mail: Ariana Dejaco adeja001@ucr.edu
5   *      Lab Section: 22
6   *      Assignment: Lab #0  Exercise # Chapter 3 Try 17
7   *      Exercise Description:
8   *      Run the above program, change AâM−^@M−^Ys switches to different values,
   and observe the output LEDs. Use the step functionality to observe that only one
    of the three branchesâM−^@M−^Y will have its statements executed.
9   *      I acknowledge all content contained herein, excluding template or exampl
   e
10  *      code, is my own original work.
11  */#include "RIMS.h"
12
13 void main() {
14 while (1) {
15 if (A <= 100) {
16 B0 = 1;
17 B1 = 0;
18 B2 = 0;
19 }
20 else if (A <= 200) {
21 B0 = 0;
22 B1 = 1;
23 B2 = 0;
24 }
25 else {
26 B0 = 0;
27 B1 = 0;
28 B2 = 1;
29 }
30 }
31 }
```

```
1  /*      jdefo002_lab0_part4.c − 4/1/13
2   *      Name & E−mail: Josuha DeForest−Williams jdefo002@ucr.edu
3   *      CS Login: Jdefo002
4   *      Partner(s) Name & E−mail: Ariana Dejaco adeja001@ucr.edu
5   *      Lab Section: 22
6   *      Assignment: Lab #0  Exercise # Chapter 3 Try 17
7   *      Exercise Description:
8   *      Run the above program. Set A to 2 and note from the printed output that
    the inner while loop body executes twice, and the result is 4, which appears on
    B. Set A to 0 and note that the inner while loop body does not execute, and the
    result is 1. Set A to 15 and note that the result is 32768, though B does not sh
    ow that value because BâM−^@M−^Ys 8 bits cannot represent numbers larger than 25
    5.
9   *      I acknowledge all content contained herein, excluding template or exampl
    e
10  *      code, is my own original work.
11  */
12 #include "RIMS.h"
13
14 void main() {
15 unsigned long result;
16 unsigned char i;
17 while (1) {
18 result = 1;
19 i = 1;
20 while (i <= A) {
21 result = result * 2;
22 puts(" Iteration: "); puti(i); puts("\r\n");
23 i = i + 1;
24 }
25 puts("Result: "); puti(result); puts("\r\n\n");
26 B = result;
27 }
28 }
```

```
/*      jdefo002_lab0_part5.c − 4/1/13
 *      Name & E−mail: Joshua DeForest−Williams jdefo002@ucr.edu
 *      CS Login: jdefo002
 *      Partner(s) Name & E−mail: Ariana Dejaco adeja001@ucr.edu
 *      Lab Section: 22
 *      Assignment: Lab # 0   Exercise # Chapter 5 try # 37
 *      Exercise Description:Run the above program and observe that the printed
output reflects the values of A7−A0. Next, add to the above program a new functi
on definition named AryCountOnes, having the same two parameters as AryPrint and
 with a return type of unsigned char, that returns the number of array elements
equal to 1. Update main to also set B to that number.
 *
 *      I acknowledge all content contained herein, excluding template or exampl
e
 *      code, is my own original work.
 */
#include "RIMS.h"

void ACopyToArray(unsigned char Ary[]) {
Ary[0]=A0; Ary[1]=A1; Ary[2]=A2; Ary[3]=A3;
Ary[4]=A4; Ary[5]=A5; Ary[6]=A6; Ary[7]=A7;
return;
}

void AryPrint(unsigned char Ary[], unsigned char ArySize) {
unsigned char i;
for (i=0; i<ArySize; i++) {
puti(Ary[(ArySize−1)−i]); // (ArySize−1)−i: print in reverse
putc(' ');
}
putc('\n');
return;
}

unsigned char AryCountOnes(unsigned char Ary[], unsigned char ArySize)
{
    unsigned char returnVal = 0;
    int i;
    for( i = 0; i < ArySize; i++)
    {
        if(Ary[i] == 1)
          returnVal++;
    }
    return returnVal;
}

void AryComplement(unsigned char Ary[], unsigned char ArySize)
{
    int i;
    for(i = 0; i < ArySize; i++)
    {
        if(Ary[i] == 0)
          Ary[i] = 1;
        else if(Ary[i] == 1)
          Ary[i] = 0;
    }
}

void main(){
const unsigned char AASize = 8;
unsigned char AA[8];
while(1) {
B = CountOnes(A0, A1, A2);
puti(count); // ADD this statement
}
}
```

```
/*      jdefo002_lab0_part6.c − 4/5/13
 *      Name & E−mail:Joshua DeForest−Williams jdefo002@ucr.edu
 *      CS Login: Jdefo002
 *      Partner(s) Name & E−mail: Ariana Dejaco adeja001@ucr.edu
 *      Lab Section: 22
 *      Assignment: Lab # 0  Exercise # 1 Chapter 1
 *      Exercise Description:
 *  Write RIM C code that sets B0 to 1 only if A0−A3 are all 1's or if A5−A7 are all 1's (or if both situations are true. Using border and sample imput value combinations, test the written code with RIMS, and generate a timing diagram showing the test results
 *      I acknowledge all content contained herein, excluding template or example
 *      code, is my own original work.
 */
#include "RIMS.h"
void main(){
        while(1){
        if (A0 && A1 && A2 && A3) {
            B0 = 1;
        }
        else if (A4 && A5 && A6 && A7) {
            B0 = 1;
        }
        else {
            B0 = 0;
        }
        }
}
```

```
1  /*      jdefo002_lab0_part7.c − 4/5/13
2   *      Name & E−mail:Joshua DeForest−Williams jdefo002@ucr.edu
3   *      CS Login: Jdefo002
4   *      Partner(s) Name & E−mail: Ariana Dejaco adeja001@ucr.edu
5   *      Lab Section: 22
6   *      Assignment: Lab # 0  Exercise Try # 11 Chapter 2
7   *      Exercise Description:
8   *  Write a single C statement for RIM that sets B3−B0 to A5−A2 and sets other o
    utput bits to 0s.
9   *      I acknowledge all content contained herein, excluding template or exampl
    e
10  *      code, is my own original work.
11  */
12 #include "RIMS.h"
13
14 void main(){
15         while(1){
16         B = A >>2 ;
17         }
18 }
```