

ICS 103, Term 093

Computer Programming in C

HW# 2 Solution

Due date: Monday, July 26, 2010

- Q.1.** The greatest common divisor (gcd) of two integers is the product of the integers' common factors. Write a program that inputs two numbers and implements the following approach to finding their gcd. As an example, we will use the numbers -252 and 735. Working with the numbers' absolute values, we find the remainder of one divided by the other; $252\%735=252$. Now we calculate the remainder of the old divisor divided by the remainder found; $735\%252=231$. We repeat this process until the remainder is zero; $252\%231=21$; $231\%21=0$. The last divisor (21) is the gcd.

Sample executions of the program are shown below:

```
Enter two integer numbers: -252 735
The GCD of the two numbers -252 and 735 is 21
Press any key to continue . . . _
Enter two integer numbers: 21 14
The GCD of the two numbers 21 and 14 is 7
Press any key to continue . . . _
```

```
#include <stdio.h>
#include <stdlib.h>

int main(void) {

    int n1, n2, i, j, r;
    printf("Enter two integer numbers: ");
    scanf("%d%d",&n1, &n2);
    i = abs(n1);
    j = abs(n2);

    do {
        r = i % j;
        i = j;
        j = r;
    } while (r !=0);

    printf ("The GCD of the two numbers %d and %d is %d\n", n1,
n2, i);

    system ("pause");
    return 0;
}
```

- Q.2.** Write a program that finds the equivalent series and parallel resistance for a collection of resistor values. Your program should compute the equivalent series resistance for all resistors in the collection and also the parallel resistance correct up to two decimal places. Use any non-positive value to indicate the end of the program data.

Sample executions of the program are shown below:

```
Enter a collection of resistor values:
1 2 3 0
Series resistance is 6.00
Parallel resistance is 0.55
Press any key to continue . . .

Enter a collection of resistor values:
10 20 -1
Series resistance is 30.00
Parallel resistance is 6.67
Press any key to continue . . . _
```

```
#include <stdio.h>
#include <stdlib.h>

int main(void) {

double r, sr=0, pr=0;
printf("Enter a collection of resistor values:\n");
scanf("%lf", &r);
while (r>0){
    sr += r;
    pr += 1/r;
    scanf("%lf", &r);
}

pr = 1 /pr;
printf("Series resistance is %.2f\n", sr);
printf("Parallel resistance is %.2f\n", pr);
system("pause");
return 0;
}
```