

Homework 3

PROBLEM SOLVING IN C
(CSCE 105, FALL 2005)

URL: <http://www.cse.unl.edu/~cstrobe/csce105f05/>

Due on 19th October, 2005

2 Octoboer, 2005

Name :

Course No : **CSCE105**

Instructions:

For questions 1 through 6, please type up your answers and hand in a printout in class. **We will not accept handwritten homework.** For questions 7, 8, 9, and 10, turn in your source code using the WebHandin. **If you use a compiler other than those on CSE, make sure that your code works on CSE!**

1. (10 points) Where possible, write the equivalent for the following statements using compound assignment operators. If it is not possible to rewrite using compound assignment operators, say so.

- (a) $x = x + 2$;
- (b) $z = z + r * m$;
- (c) $m = m * y + 1$;
- (d) $x = x - (a + b - c)$;
- (e) $total = 5 * total$;

2. (10 points) What is displayed by the following code fragment when the user inputs the value 16?

```
scanf("%d", &n);
ev = 1;
while(ev <= n){
    printf("%d\n", ev);
    ev += n % ev + 2;
}
```

3. (10 points) In class we saw how to use a for loop to compute the product of all numbers from 1 to 100. Take that for loop and convert it so that it computes the product of all even numbers from 1 to 100.
4. (10 points) Correct the syntax and logic of the following code fragments.

- (a) This fragment is supposed to print all numbers starting at 5 and counting down to 1.

```
do
count = 5;
printf("%d\n", count);
count = count - 1;
while count > 0;
```

- (b) This fragment is supposed to print all multiples of 5 from 0 to 100.

```
for sum = 0;
    sum < 100;
    sum += 5;
printf("%d\n", sum);
```

5. (10 points) Write a function called `sum_range` that takes two arguments `x` and `y`. This function will return the sum of all integers between `x` and `y`. You must write this function using either a for loop or a while loop.
6. (10 points) Write a program fragment that first asks the user to enter an integer value and store it in a variable called `base`. Then write a do while loop that keeps asking the user to enter another value until the user enters a value that is a multiple of `base`.

7. (10 points) Write a program that asks the user to enter a number, and then displays the multiplication table for all numbers from 0 to the number they entered. This should be done with nested for loops.

For example, if the user enters 3, they should see:

```
0 0 0
0 1 2
0 2 4
```

8. (10 points) Write a program that reads numbers from a file named **numbers.dat**. Your program will compute the average of all of the numbers in the file, and print that to the screen.

Because you don't know how many numbers will be in the file, you will have to implement this with a loop that reads until the end of the file.

9. (10 points) Write a program that determines how long it will take a town's population to reach a certain number. Your program will ask the user for two values - a starting population and an ending population. Assuming that the population increases by 10 percent each year, your program should use a loop to determine how many years it will take for the population to surpass the specified ending population. Output this result to the user.
10. (10 points) Write a program to display a Celsius to Fahrenheit conversion table. Ask the user to enter two values - the bottom and top of a range. Your program will then display the conversion of all temperatures between those two values that are multiples of 10. The conversion should be done in a function called **fahrenheit**.

For example, if the user enters 3 and 44, your program should display the following:

Celsius	Fahrenheit
10	50
20	68
30	86
40	104

Hint: You already wrote the function **fahrenheit** in homework 2, problem 9. You can reuse it here.

Question	Points	Score
1	10	
2	10	
3	10	
4	10	
5	10	
6	10	
7	10	
8	10	
9	10	
10	10	
Total:	100	