*University of Washington*
*Department of Electrical Engineering*

Name_____

*Working with stdin and stdout, and Control Flow*

1. For a number of reasons, when testing a product as part of the manufacturing cycle, we are interested how the values of certain signals may vary based upon such things as different part vendors, part date codes, or with the manufacturing process itself. Two important measures are the average values of such signals and standard deviation of those values across a production run or between runs. Write a function `ave5` that returns the average of five integer values passed to it as parameters. Write a similar function `stdev5` that returns the standard deviation of its five integer parameters.

2. Write a program to print the largest and smallest values of its input. That is, your user is prompted to enter a value until they get bored. At that point, print out the largest and smallest values entered.

3. Bill is planning a major motorcycle trip all over the west coast at the end of the quarter. He wants to start saving money for his trip now and wants an estimate as to what the trip might cost. Write a program to help him with that. For now, he is focusing on the fuel and operating expenses for his bike and the potential cost of food.
   Write a function that calculates the number of gallons of fuel required for traveling a specific distance in miles. His motorcycle gets 55.0 miles to the gallon.
   On the road, he averages 300-500 miles a day and food costs for each day he is on the road average $85.00. If the average price of fuel where he will be traveling is $4.32 a gallon and its costs $0.86 to operate the bike each mile, write a second function to calculate the range in dollars for the total cost of the trip. He will ultimately decide on the number of days for the trip based upon total cost.

4. Write a program that prompts you for the amount of money owing on a credit card debt, the yearly interest rate on the debt, and the amount you want to pay each month. Write a function that then computes the number of years it will take to pay off the debt given the information provided.

5. Modify the following program to allow more than one interest rate, period, and balance to be entered.

```
#include <stdio.h>

//  function prototypes

        void        displayValues(double yrlyPct, double startBal);
        double      yearEndBalance(double intrate, double monthlyBal);

int main(void)
{
        //  working variables
        int         period = 0;             // length of period in years
        int         year = 0;               // year of period
        double      balance = 0;            // balance at end of year
        double      intrate = 0;            // interest rate

        //  prompt the user and get inputs
        printf("Enter interest rate, principal, and period: ");

        scanf("%lf %lf %i", &intrate, &balance, &period);

        // convert percent to fraction
        intrate = intrate/100;

        // print out values entered
        displayValues(intrate, balance);

        // print heading
        printf("Year  Balance\n");

        // compute and print yearly balance
        for (year = 1; year <= period; year = year + 1)
        {
                balance = yearEndBalance (intrate, balance);
                printf("%4i   $%7.2f\n", year, balance);
        }

        return 0;                       // assume program succeeded
}

//  display user information
void displayValues (double yrlyPct, double startBal)
{
        printf("Interest Rate:    %7.2f%\n", yrlyPct);
        printf("Starting Balance: $%7.2f\n\n", startBal);
}

//  compute yearly balance
double yearEndBalance (double intrate, double monthlyBal)
{
        //  working variables
        int month                       = 0;
        double  monthlyIntrate          = 0;

        //  convert annual to monthly interest rate
        monthlyIntrate                  = intrate / 12;

        //  compute year end balance
        for (month = 0; month < 12; month = month + 1)
        {
                monthlyBal = monthlyBal * monthlyIntrate + monthlyBal;
        }

        return monthlyBal;
}
```