**CS120 Fundamental of Programming**

**Homework 5: Repetition Structure**

**Exercises**

1. Write a C program to compute factorial of a number using for loop. Factorial is represented using '!', so five factorial will be written as (5!), n factorial as (n!). Also n! = n\*(n-1)\*(n-2)\*(n-3)...3.2.1 and zero factorial is defined as one i.e. 0! = 1.

#include <stdio.h>

int main()

{

int num, i, factorial = 1;

printf("Enter a number to compute factorial : ");

scanf("%d", &num);

for ( i = num ; i >= 2 ; i-- )

factorial = factorial \* i;

printf("%d! = %d\n", num, factorial);

return 0;

}

1. The harmonic mean is another way of calculating the mean for a set of numbers. The harmonic mean of a set of numbers is given by the equation  
   Write a program that will input 10 number (i.e. N = 10) of positive input values and calculate the harmonic mean of the numbers.

#include <stdio.h>

int main()

{

int i , num;

float sum = 0.0, mean;

for ( i = 1 ; i <= 10 ; i++ )

{

printf("Enter a number : ");

scanf("%d", &num);

sum = sum + 1/(float)num;

}

mean = 10 / sum;

printf("Harmonic mean = %.2f\n", mean);

system("pause");

return 0;

}

1. Write a program that inputs a number and prints its square and cube values. The program should repeat this process, unless the input number is a negative value.

#include <stdio.h>

int main()

{

int num = 1;

while ( num > 0 )

{

printf("Enter a number : ");

scanf("%d", &num);

if ( num > 0 )

printf("%d^2 = %d, and %d^3 = %d\n", num, num\*num, num, num\*num\*num);

}

system("pause");

return 0;

}

1. Write a program to find the range of a set of n numbers. The numbers are input through the keyboard via a loop. Range is the difference between the smallest and biggest numbers in the list. Hint: Inside the loop, find the minimum and the maximum number.

#include <stdio.h>

int main()

{

int i, num, n, min, max, range;

printf("How many numbers you like to enter? ");

scanf("%d", &n);

for ( i = 1 ; i <= n ; i++ )

{

printf("Enter a number : ");

scanf("%d", &num);

// if it's first loop iteration, initialize the value of min & max

if ( i == 1 )

{

min = num;

max = num;

}

// in 2nd & higher iterations, check and update the min (minimum) value

if ( num < min )

min = num;

// in 2nd & higher iterations, check and update the max (maximum) value

if ( num > max )

max = num;

}

range = max - min;

printf("Min = %d, Max = %d, Range = %d\n", min, max, range);

system("pause");

return 0;

}