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**COURSE CODE: CSC 312(C PROGRAMMING AND ASSEMBLY LANGUAGE)**

**/\* QUESTION 1**

C program to calculate the weighted average of a list of n numbers, using the formula

x = f1x1 + f2x2 + f3x3 + .... + fnxn.

\*/

#include <stdio.h>

float avg(float y[], float x[], float sum, int i);

int main() {

float f[05];

float x[05];

int i = 0;

float sumF = 0;

while (++i <= 05){

printf("f%d = ", i);

scanf("%f", &f[i - 1]);

printf("x%d = ", i);

scanf("%f", &x[i - 1]);

sumF += f[i - 1];

}

if (sumF != 1){

printf("The summation of F must be equal to 1 \n");

} else {

printf("\n");

printf("Weighted Average: %.3f \n", avg(f, x, 0, 0));

}

return 0;

}

float avg(float f[], float x[], float sum, int i){

if (i > 5)

return sum;

sum += f[i] \* x[i];

return avg(f, x, sum, ++i);

}

**/\* QUESTION 2**

\* C program to calculate the geometric average of a list of numbers, using the formula

\* x = [x1x2x3 .... xn]^1/n

\*

\*/

#include <stdio.h>

#include <math.h>

double ave(float x[], int n);

int main() {

int n;

printf("Enter the number of data items: ");

scanf("%d", &n);

float y[n];

int i = 0;

while (++i <= n) {

printf("Data item %d: ", i);

scanf("%f", &x[i - 1]);

}

printf("Geometric Average: %f \n", ave(x, n));

return 0;

}

double ave(float x[], int n){

double mul = 1;

for (int i = 0; i < n; i++){

mul \*= x[i];

}

return pow(mul, 1.0f/n);

}

**QUESTION 3**

// Fibonacci

#include <stdio.h>

void fibonacci(int n, int i, int fib, int var1);

int main() {

int n;

printf("Enter the number of terms of fibonacci series: ");

scanf("%d", &n);

fibonacci(n, 0, 0, 1);

return 0;

}

void fibonacci(int n, int i, int fib, int var1){

if (fib == 0)

printf("%d ", 1);

if (i < n - 1){

fib = fib + var1;

printf("%d ", fib);

fibonacci(n, ++i, var1, fib);

}

}

**QUESTION 4**

#include <stdio.h>

#include <math.h>

int factorial(int fact);

double sinx(int x, int n);

int main() {

int n, x;

printf("enter number of terms: ");

scanf("%d", &n);

printf("enter value for x: ");

scanf("%d", &x);

printf("\n");

printf("sin(x) = %f\n", sinx(x, n));

return 0;

}

int factorial(int fact) {

if (fact == 0)

return 1;

return fact \* factorial(fact - 1);

}

double sinx(int x, int n){

int i = 0;

int y = 1;

double sum = pow(x, 1) / factorial(1);

while (++i < n){

y += 4;

if (i % 4 == 1){

sum -= pow(x, y) / factorial(y);

} else

sum += pow(x, y) / factorial(y);

}

return sum;

}

**QUESTION 5**

#include <stdio.h>

int main() {

for (int i = 1; i <= 05; i++){

for (int k = 05; k > i; k--) {

printf(" ");

}

for (int j = i; j < 2 \* i - 1; j++) {

printf("%d", j % 05);

}

for (int j = 2 \* i - 1; j >= i ; j--) {

printf("%d", j % 05);

}

printf("\n");

}

return 0;

}