SENARATHNA G.G.P.C. – 214189E.

Single dimensional arrays.

Exercises.

01)

a)

#include <stdio.h>  
int main() {  
 int n,max;  
 printf("Input the n number of elementd in an array : \n");  
 scanf("%d", &n);  
 int arr[n];  
 printf("Enter the n number of elements : \n");  
  
 for(int i = 0;i < n;i++) {  
 scanf("%d ", &arr[i]);  
 }  
 printf("\n");  
 for(int j = 0;j < n;j++) {  
 printf("%d ", arr[j]);  
 }  
 printf("\n");  
 max = arr[0];  
 for(int l = 0;l < n;l++) {  
 if(arr[l] > max) {  
 max = arr[l];  
 }  
 }  
 printf("maximum number is : %d", max);  
 return 0;  
}

b)

#include <stdio.h>  
void arr\_max(int x);  
int main() {  
 int n;  
 printf("Input the n number of elements in an array : \n");  
 scanf("%d", &n);  
 arr\_max(n);  
  
 return 0;  
}  
void arr\_max(int x) {  
 int arr[x],max;  
 printf("Enter the number of elements : \n");  
 for(int i = 0;i < x;i++) {  
 scanf("%d", &arr[i]);  
 }  
 printf("\n");  
 for(int j = 0;j < x;j++) {  
 printf("%d ", arr[j]);  
 }  
 printf("\n");  
 max = arr[0];  
 for(int l = 0;l < x;l++) {  
 if(arr[l] > max) {  
 max = arr[l];  
 }  
 }  
 printf("maximum number is : %d", max);  
}

02)

a)

#include <stdio.h>  
int main() {  
 int n,min;  
 printf("Input n number of elements in an array : \n");  
 scanf("%d", &n);  
 int arr[n];  
 printf("Enter the n number of elements : \n");  
 for(int i = 0;i < n;i++) {  
 scanf("%d", &arr[i]);  
 }  
 printf("\n");  
 for(int j = 0;j < n;j++) {  
 printf("%d ", arr[j]);  
 }  
 printf("\n");  
 min = arr[n - 1];  
 for(int l = n - 1;l >= 0;l--) {  
 if(arr[l] < min) {  
 min = arr[l];  
 }  
 }  
 printf("minimum number is : %d", min);  
 return 0;  
}

b)

#include <stdio.h>  
void arr\_min(int x);  
int main() {  
 int n;  
 printf("Input n number of elements in an array : \n");  
 scanf("%d", &n);  
 arr\_min(n);  
  
 return 0;  
}  
void arr\_min(int x) {  
 int arr[x],min;  
 printf("Enter the n elements : \n");  
 for(int i = 0;i < x;i++) {  
 scanf("%d", &arr[i]);  
 }  
 printf("\n");  
 for(int j = 0;j < x;j++) {  
 printf("%d ", arr[j]);  
 }  
 printf("\n");  
 min = arr[x - 1];  
 for(int l = x - 1;l >= 0;l--) {  
 if(arr[l] < min) {  
 min = arr[l];  
 }  
 }  
 printf("minimum number is : %d", min);  
}

03)

#include <stdio.h>  
int main() {  
 int age[10],count;  
 printf("Input the age of 10 students : \n");  
 for(int i = 0;i < 10;i++) {  
 scanf("%d", &age[i]);  
 }  
 printf("\n");  
 for(int j = 0;j < 10;j++) {  
 printf("%d ", age[j]);  
 }  
 printf("\n");  
 for(int l = 0;l < 10;l++) {  
 if((age[l] >= 17) && (age[l] <= 19)) {  
 count++;  
 }  
 }  
 printf("number of students who have the age between 17-19 : %d", count);  
}

04)

#include <stdio.h>  
int main() {  
 float salary[10];  
 int count;  
 printf("Input the salary of 10 employees : \n");  
 for(int i = 0;i < 10;i++) {  
 scanf("%f", &salary[i]);  
 }  
 printf("\n");  
 for(int l = 0;l < 10;l++) {  
 if((salary[l] >= 50000.00) && (salary[l] <= 75000.00)) {  
 count++;  
 }  
 }  
 printf("number of employees getting salary in between 50,000 – 75,000 : %d", count);  
 return 0;  
}

05)

a)

#include <stdio.h>  
void avg(int arr[],int size);  
int main() {  
 int n;  
 printf("Input n number of elements in array : \n");  
 scanf("%d", &n);  
 int arr[n];  
 printf("Enter the n number of elements : \n");  
 for(int i = 0;i < n;i++) {  
 scanf("%d", &arr[i]);  
 }  
 avg(arr,n);  
  
 return 0;  
}  
void avg(int arr[],int size) {  
 float sum = 0,avg = 0;  
 for(int j = 0;j < size;j++) {  
 sum = sum + arr[j];  
 }  
 avg = sum / size;  
 printf("average of array elements is : %f", avg);  
}

b)

#include <stdio.h>  
void arr(int x);  
int main() {  
 int n;  
 printf("Input the n number of elements in an array : \n");  
 scanf("%d", &n);  
 arr(n);  
  
 return 0;  
}  
void arr(int x) {  
 int arr[x];  
 float sum = 0,avg = 0;  
 printf("Enter the n number of elements : \n");  
 for(int i = 0;i < x;i++) {  
 scanf("%d", &arr[i]);  
 }  
 printf("\n");  
 for(int j = 0;j < x;j++) {  
 sum = sum + arr[j];  
 }  
 avg = sum / x;  
 printf("average of array elements is : %.4f", avg);  
}

06)

a)

#include <stdio.h>  
void desc\_order(int arr[],int size);  
int main() {  
 int n;  
 printf("Input n number of elements in an array : \n");  
 scanf("%d", &n);  
 int arr[n];  
 printf("Enter n number of elements : \n");  
 for(int i = 0;i < n;i++) {  
 scanf("%d", &arr[i]);  
 }  
 desc\_order(arr,n);  
  
 return 0;  
}  
void desc\_order(int arr[],int size) {  
 int temp;  
 for(int j = 0;j < size;j++) {  
 for(int l = j;l < size;l++) {  
 if(arr[l] > arr[j]) {  
 temp = arr[j];  
 arr[j] = arr[l];  
 arr[l] = temp;  
 }  
 }  
 printf("%d ", arr[j]);  
 }  
}

b)

#include <stdio.h>  
void desc\_order(int size);  
int main() {  
 int n;  
 printf("Input n number of elements in an array : \n");  
 scanf("%d", &n);  
 desc\_order(n);  
  
 return 0;  
}  
void desc\_order(int size) {  
 int arr[size],temp;  
 printf("Enter the n number of elements : \n");  
 for(int i = 0;i < size;i++) {  
 scanf("%d", &arr[i]);  
 }  
 for(int j = 0;j < size;j++) {  
 for(int l = j;l < size;l++) {  
 if(arr[l] > arr[j]) {  
 temp = arr[l];  
 arr[l] = arr[j];  
 arr[j] = temp;  
 }  
 }  
 printf("%d ", arr[j]);  
 }  
}

07)

a)

#include <stdio.h>  
#include "math.h"  
  
float corrCoefficient(float xVals[], float yVals[], int n){  
 float Ex=0, Ey=0, Exy=0, Ex2=0, Ey2=0, r;  
  
 for (int i = 0; i < n; ++i) {  
 Ex+=xVals[i];  
 Ey+=yVals[i];  
  
 Ex2+=xVals[i]\*xVals[i];  
 Ey2+=yVals[i]\*yVals[i];  
  
 Exy+=xVals[i]\*yVals[i];  
  
 }  
 float numerator = Exy - (Ex\*Ey)/n;  
 float part1 = Ex2 - (Ex\*Ex)/n;  
 float part2 = Ey2 - (Ey\*Ey)/n;  
 float denominator = sqrt(part1) \* sqrt(part2);  
  
 r = numerator/denominator;  
 return r;  
}  
  
float regrCoefficient(float xVals[], float yVals[], int n){  
 float Ex=0, Ey=0, Exy=0, Ex2=0, byx;  
  
 for (int i = 0; i < n; ++i) {  
 Ex+=xVals[i];  
 Ey+=yVals[i];  
  
 Ex2+=xVals[i]\*xVals[i];  
 Exy+=xVals[i]\*yVals[i];  
  
 }  
 float numerator = Exy - (Ex\*Ey)/n;  
 float denominator = Ex2 - (Ex\*Ex)/n;  
  
 byx = numerator/denominator;  
 return byx;  
}  
  
int main() {  
 int n=12;  
 float xVals[12]= {1,0,3.2, 4,1,5,7,0,2,1.1,-1,4.1};  
 float yVals[12]= {3,5,0,-1,0.5,-1,-2,3,4,1,8.1,2};  
  
 float r = corrCoefficient(xVals, yVals, n);  
 printf("r: %.4f\n", r);  
  
 float byx = regrCoefficient(xVals, yVals, n);  
 printf("y - ybar = %.4f(x - xbar)", byx);  
 return 0;  
}

b)

#include <stdio.h>  
#include <math.h>  
int main(){  
  
 double sum\_xy=0,sum\_xx=0,sum\_yy=0,sum\_x=0,sum\_y=0,r,byx,fStep,sStep,tStep;  
 double x[12]={1,0,3.2,4,1,5,7,0,2,1.1,-1,4.1};  
 double y[12]={3,5,0,-1,0.5,-1,-2,3,4,1,8.1,2};  
  
 for(int i=0;i<12;i++)  
 {  
 sum\_xy+=(x[i]\*y[i]);  
 sum\_x+=x[i];  
 sum\_y+=y[i];  
 sum\_xx+=pow(x[i],2);  
 sum\_yy+=pow(y[i],2);  
  
 }  
 fStep = sum\_xy-((sum\_x\*sum\_y)/12);  
 sStep = sqrt(sum\_xx-(pow(sum\_x,2)/12)) ;  
 tStep = sqrt(sum\_yy-(pow(sum\_y,2)/12));  
  
 r = fStep /(sStep \* tStep ) ;  
 byx =fStep / (pow(sStep,2));  
  
 printf(" r = %lf\n",r);  
 printf("byx = %lf",byx);  
 return 0;  
}