**EXERCISE - 1**

**1) Write a C Program to find the Area of a Circle.**

#include <stdio.h>

int main()

{

float r,a;

printf("Enter the Radius of the Circle : ");

scanf("%f",&r);

a=3.14\*r\*r;

printf("The Area of the Circle is %.2f",a);

return 0;

}

**2) Write a C Program to calculate Simple Interest.**

#include <stdio.h>

int main()

{

float p,n,r,si;

printf("Enter the Principal Amount : ");

scanf("%f", &p);

printf("Enter the Number of Years : ");

scanf("%f", &n);

printf("Enter the Rate of Interest : ");

scanf("%f", &r);

si=(p\*n\*r)/100;

printf("Simple Interest : %.2f", si);

return 0;

}

**3) Write a C Program to convert specified days into years,weeks and days.**

#include <stdio.h>

int main()

{

int days, years, weeks;

printf("Enter days: ");

scanf("%d", &days);

years = (days / 365);

weeks = (days % 365) / 7;

days = days - ((years \* 365) + (weeks \* 7));

printf("YEARS: %d\n", years);

printf("WEEKS: %d\n", weeks);

printf("DAYS: %d", days);

return 0;

}

**EXERCISE - 2**

**1) Write a C Program to read any Month Number in integer and display the number of days for this month.**

#include <stdio.h>

int main()

{

int n;

printf("Enter Month Number between 1 and 12 : ");

scanf("%d",&n);

switch(n)

{

case 1:

printf("Month is January and has 31 days");

break;

case 2:

printf("Month is February and has 28 days");

break;

case 3:

printf("Month is March and has 31 days");

break;

case 4:

printf("Month is April and has 30 days");

break;

case 5:

printf("Month is May and has 31 days");

break;

case 6:

printf("Month is June and has 30 days");

break;

case 7:

printf("Month is July and has 31 days");

break;

case 8:

printf("Month is August and has 31 days");

break;

case 9:

printf("Month is September and has 30 days");

break;

case 10:

printf("Month is October and has 31 days");

break;

case 11:

printf("Month is November and has 30 days");

break;

case 12:

printf("Month is December and has 31 days");

break;

default :

printf("Invalid.Please enter a number between 1 and 12");

break;

}

return 0;

}

**2 )Write a C program to input basic salary of an employee and calculate its Gross salary according to following:**

**Basic Salary <= 10000 : HRA = 20%, DA = 80%**

**Basic Salary <= 20000 : HRA = 25%, DA = 90%**

**Basic Salary > 20000 : HRA = 30%, DA = 95%**

#include<stdio.h>

int main()

{

float basic,gross,da,hra;

printf("Enter the Basic Salary of an Employee: ");

scanf("%f", &basic);

if(basic<=10000)

{

da=basic\*0.8;

hra=basic\*0.2;

}

else if(basic<=20000)

{

da=basic\*0.9;

hra=basic\*0.25;

}

else if(basic>20000)

{

da=basic\*0.95;

hra=basic\*0.3;

}

gross=basic+hra+da;

printf("Basic Salary of the Employee = %.2f \n",basic);

printf("HRA of the Employee = %.2f \n",hra);

printf("DA of the Employee = %.2f \n",da);

printf("Gross Salary of the Employee = %.2f",gross);

return 0;

}

**3) Write a C program using switch case to find Addition, Subtraction, Multiplication and Division of two numbers.**

#include<stdio.h>

int main()

{

float a,b;

int op;

printf(" 1.Addition\n2.Subtraction\n3.Multiplication\n4.Division\n");

printf("Enter your Choice : ");

scanf("%d",&op);

printf("Enter the values of a & b: ");

scanf("%f %f",&a,&b);

switch(op)

{

case 1:

printf("Sum of %.2f and %.2f is : %.2f",a,b,a+b);

break;

case 2:

printf("Difference between %.2f and %.2f is : %.2f",a,b,a-b);

break;

case 3:

printf("Product of %.2f and %.2f is : %.2f",a,b,a\*b);

break;

case 4:

printf("Division of the two numbers is %.2f ",a/b);

break;

default:

printf("Invalid.Please enter correct choice.");

break;

}

return 0;

}

**EXERCISE - 3**

**1) Write a C-program to find Arithmetic Progression of given numbers(for loop).**

#include <stdio.h>

int main()

{

int a,i,n,d,term;

printf("Enter the Total Number of Terms : ");

scanf("%d", &n);

printf("Enter the First Term of the Arithmetic Progression : ");

scanf("%d", &a);

printf("Enter the Common Difference of the Arithmetic Progression : ");

scanf("%d", &d);

printf("\nArithmetic Progression \t");

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

{

term = a+((i-1)\*d);

printf("%d\t", term);

}

return 0;

}

**2) Write a C Program to find Factorial value of the given number(While Loop)**

#include<stdio.h>

int main()

{

int n,i,f;

f=i=1;

printf("Enter a Number to Find Factorial: ");

scanf("%d",&n);

while(i<=n)

{

f=f\*i;

i++;

}

printf("The Factorial of %d is %d",n,f);

return 0;

}

**3) Write a C Program to find reverse number of the given number (Do While Loop)**

#include<stdio.h>

int main()

{

int n,a,r,s=0;

printf("\n Enter The Number:");

scanf("%d",&n);

a=n;

do

{

r=n%10;

s=s\*10+r;

n=n/10;

}while(n>0);

printf("\n The Reverse of the Number %d is %d",a,s);

return 0;

}

**EXERCISE - 4**

**1) Write a recursive function to find the sum of Natural numbers between 1 to n.**

#include<stdio.h>

int natural(int num);

int main()

{

int n;

printf("Enter a Number : ");

scanf("%d",&n);

printf("The Sum of Natural Numbers from 1 to %d is %d",n,natural(n));

return 0;

}

int natural(int num)

{

if(num==0)

return 0;

else

return num+natural(num-1);

}

**2)Write a C Function “Calculate” to find the Average of subjects whose marks is greater than or equal to 60,and also display the number of subjects having marks greater than or equal to 60.**

#include <stdio.h>

int main()

{

int n,i,count=0;

float marks[100],sum=0.0,avg,average;

printf("Enter the Number of Subjects: ");

scanf("%d",&n);

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

{

printf("Enter Mark %d : ",i+1);

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

}

float calculate(float marks[])

{

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

{

if(marks[i]>=60)

{

sum+=marks[i];

count+=1;

}

}

avg=sum/count;

}

average=calculate(marks);

printf("Average = %.2f", average);

return 0;

}

**3) Write a C Function to find whether the given number is Prime or not.**

#include <stdio.h>

int prime(int n1)

{

int i=2;

while(i<=n1/2)

{

if(n1%i==0)

return 0;

else

i++;

}

return 1;

}

int main()

{

int n1,x;

printf("Enter a Number : ");

scanf("%d",&n1);

x = prime(n1);

if(x==1)

{

printf("The number %d is a Prime Number.\n",n1);

}

else

{

printf("The number %d is Not a Prime Number.\n",n1);

}

return 0;

}

**EXERCISE - 5**

**1) Write a C-program to find the number of vowels and digits in the given string.**

#include <stdio.h>

int main()

{

int c=0,vowels=0,digits=0;

char s[1000];

printf("Input a String : ");

gets(s);

while (s[c] != '\0')

{

if (s[c] == 'a' || s[c] == 'A' || s[c] == 'e' || s[c] == 'E' || s[c] == 'i' || s[c] == 'I' || s[c] =='o' || s[c]=='O' || s[c] == 'u' || s[c] == 'U')

vowels++;

else if (s[c] == '0' || s[c] == '1' || s[c] == '2' || s[c] == '3' || s[c] == '4' || s[c] == '5' || s[c] =='6' || s[c]=='7' || s[c] == '8' || s[c] == '9')

digits++;

c++;

}

printf("Number of Vowels in the given string : %d\n",vowels);

printf("Number of Digits in the given string : %d",digits);

return 0;

}

**2) Write a C-program to find the Reverse of a String.**

#include <stdio.h>

#include <string.h>

int main()

{

char Str[100],RevStr[100];

int i,j=0,len;

printf("Enter a String : ");

gets(Str);

len=strlen(Str);

for(i=len-1;i>=0;i--)

{

RevStr[j++]=Str[i];

}

printf("\nThe Reverse of the given String is %s",RevStr);

return 0;

}

**3) Write a C-program to compare two strings,if they are different,concatenate those strings and finally print the length of the concatenated string.**

#include<stdio.h>

#include<string.h>

int main()

{

char str1[100],str2[100];

printf("Enter String 1 : ");

gets(str1);

printf("Enter String 2 : ");

gets(str2);

if(strcmp(str1,str2)==0)

{

printf("Two Strings are Same.");

}

else

{

printf("Concatenated String : %s",strcat(str1,str2));

printf("\nThe Length of the Concatenated String is %d",strlen(str1));

}

return 0;

}

**EXERCISE - 6**

**1)Write a C Program to search the given element in an array.**

#include<stdio.h>

int main()

{

int a[100],i,n,element;

printf("Enter the size of the array : ");

scanf("%d",&n);

printf("Enter the elements of the array : ");

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

{

scanf("%d",&a[i]);

}

printf("Enter the element to be searched : ");

scanf("%d",&element);

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

{

if(a[i]==element)

{

printf("Element is found at index %d",i);

return 0;

}

}

printf("Element not found.");

}

**2) Write a C Program to find Sum of two matrices.**

#include<stdio.h>

int main()

{

int r,c,i,j,a[100][100],b[100][100],sum[100][100];

printf("Enter the number of Rows and Columns of the Matrix : ");

scanf("%d %d",&r,&c);

printf("Enter the elements of the First Matrix\n");

for(i=0;i<r;i++)

{

for(j=0;j<c;j++)

{

printf("Enter the element a%d%d : ",i+1,j+1);

scanf("%d",&a[i][j]);

}

}

printf("Enter the elements of the Second Matrix\n");

for(i=0;i<r;i++)

{

for(j=0;j<c;j++)

{

printf("Enter the element b%d%d : ",i+1,j+1);

scanf("%d",&b[i][j]);

}

}

for(i=0;i<r;i++)

{

for(j=0;j<c;j++)

{

sum[i][j]=a[i][j]+b[i][j];

}

}

printf("First Matrix\n");

for(i=0;i<r;i++)

{

for(j=0;j<c;j++)

{

printf("%d\t",a[i][j]);

}

printf("\n");

}

printf("Second Matrix\n");

for(i=0;i<r;i++)

{

for(j=0;j<c;j++)

{

printf("%d\t",b[i][j]);

}

printf("\n");

}

printf("Sum of two Matrices\n");

for(i=0;i<r;i++)

{

for(j=0;j<c;j++)

{

printf("%d\t",sum[i][j]);

}

printf("\n");

}

return 0;

}

**3)Write a C Program to find the Transpose of a Matrix.**

#include<stdio.h>

int main()

{

int r,c,i,j,a[100][100],t[100][100];

printf("Enter the number of Rows and Columns of the Matrix : ");

scanf("%d %d",&r,&c);

printf("Enter the elements of the Matrix\n");

for(i=0;i<r;i++)

{

for(j=0;j<c;j++)

{

printf("Enter the element a%d%d : ",i+1,j+1);

scanf("%d",&a[i][j]);

}

}

for(i=0;i<r;i++)

{

for(j=0;j<c;j++)

{

t[j][i]=a[i][j];

}

}

printf("Given Matrix\n");

for(i=0;i<r;i++)

{

for(j=0;j<c;j++)

{

printf("%d\t",a[i][j]);

}

printf("\n");

}

printf("Transpose of the Matrix\n");

for(i=0;i<c;i++)

{

for(j=0;j<r;j++)

{

printf("%d\t",t[i][j]);

}

printf("\n");

}

return 0;

}

**EXERCISE - 7**

**1) Write a C Program to swap two variables using Call by Value and Call by Reference Method.**

#include<stdio.h>

int swap1(int,int);

int swap2(int\*,int\*);

int main()

{

int x,y;

printf("Enter the values of X and Y : ");

scanf("%d %d",&x,&y);

printf("Before Swapping\nX=%d\nY=%d\n",x,y);

printf("Values of X and Y after swapping by Call by Value Method is

%d %d\n",swap1(x,y));

swap2(&x,&y);

return 0;

}

int swap1(int a,int b)

{

int temp;

temp=b;

b=a;

a=temp;

return a,b;

}

int swap2(int \*a,int \*b)

{

int temp;

temp=\*b;

\*b=\*a;

\*a=temp;

printf("Values of X and Y after swapping by Call by Reference Method is

%d %d\n",\*a,\*b);

}

**2) Write a C Program to find average marks of a student and allocate grades using pointers and calloc() function.**

#include<stdio.h>

#include<stdlib.h>

int main()

{

int n,\*mark,i,sum=0;

float avg;

printf("Enter the Number of Subjects : ");

scanf("%d",&n);

mark=(int \*)calloc(n,sizeof(int));

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

{

printf("Enter Marl %d : ",i+1);

scanf("%d",&mark[i]);

sum+=mark[i];

}

avg=(float)sum/n;

printf("The Average of the Marks is %.2f\n",avg);

if(avg>=80)

{

printf("Grade : Distinction");

}

else if(avg>=60 && avg<80)

{

printf("Grade : First Class");

}

else if(avg>=40 && avg<60)

{

printf("Grade : Second Class");

}

else

{

printf("You have Failed");

}

return 0;

}

**3) Write a C Program to find Sum and Average of elements in a pointer using malloc() and realloc() function.**

#include<stdio.h>

#include<stdlib.h>

int main()

{

int i,n1,n2,\*arr,sum1=0,sum2=0;

float avg1,avg2;

printf("Enter the number of elements : ");

scanf("%d",&n1);

arr=(int \*)malloc(n1\*sizeof(int));

if(arr==0)

{

printf("Invalid");

exit(0);

}

printf("Enter the elements : ");

for(i=0;i<n1;i++)

{

scanf("%d",&arr[i]);

sum1+=arr[i];

}

avg1=(float)sum1/n1;

printf("The Sum is %d\n",sum1);

printf("The Average is %.2f\n",avg1);

printf("Enter the size to be reallocated : ");

scanf("%d",&n2);

arr=realloc(arr,n2);

printf("Enter the new elements : ");

for(i=0;i<n2;i++)

{

scanf("%d",&arr[i]);

sum2+=arr[i];

}

avg2=(float)sum2/n2;

printf("The Sum is %d\n",sum2);

printf("The Average is %.2f\n",avg2);

return 0;

}

**EXERCISE - 8**

**1) Write a C Program to find Average marks of students and display the records using Structure.**

#include<stdio.h>

struct student

{

char name[100],clas[10],gender;

int rollno,marks;

}s[100];

int main()

{

int n,i,sum=0;

float avg;

printf("Enter the number of students : ");

scanf("%d",&n);

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

{

printf("Enter the Name : ");

scanf("%s",s[i].name);

printf("Enter the Class : ");

scanf("%s",s[i].clas);

printf("Enter the Roll Number : ");

scanf("%d",&s[i].rollno);

printf("Enter the Gender : ");

scanf("%s",&s[i].gender);

printf("Enter the Marks : ");

scanf("%d",&s[i].marks);

sum+=s[i].marks;

}

avg=(float)sum/n;

printf("Records of Students\n");

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

{

printf("Name : %s\n",s[i].name);

printf("Class : %s\n",s[i].clas);

printf("Roll Number : %d\n",s[i].rollno);

printf("Gender : %c\n",s[i].gender);

printf("Marks : %d\n",s[i].marks);

}

printf("The average mark of %d students is %.2f",n,avg);

return 0;

}

**2)Write a C Program to get employee details using structure and sort them according to years of experience.**

#include<stdio.h>

struct employee

{

char name[100],empid[15];

int exper;

float salary;

}s[50],z;

int main()

{

int n,i,j;

printf("Enter the Number of Employees : ");

scanf("%d",&n);

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

{

printf("Enter the Name : ");

scanf("%s",s[i].name);

printf("Enter Employee ID : ");

scanf("%s",s[i].empid);

printf("Enter the Annual Salary : ");

scanf("%f",&s[i].salary);

printf("Enter the years of experience : ");

scanf("%d",&s[i].exper);

}

printf("Employee Records\n");

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

{

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

{

if(s[i].exper<s[j].exper)

{

z=s[i];

s[i]=s[j];

s[j]=z;

}

}

}

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

{

printf("Name : %s\n",s[i].name);

printf("ID : %s\n",s[i].empid);

printf("Salary : %.2f\n",s[i].salary);

printf("Experience : %d\n",s[i].exper);

}

return 0;

}

**3) Write a C Program using typedef and structure to get the weight of fruits,price per KG and find the total price of each fruit.**

#include<stdio.h>

typedef struct fruit

{

float a,o,m,w;

int acost,ocost,mcost,wcost;

}weight;

int main()

{

weight A,O,M,W;

printf("Enter the cost of Apple per KG : ");

scanf("%d",&A.acost);

printf("Enter the cost of Orange per KG : ");

scanf("%d",&O.ocost);

printf("Enter the cost of Mango per KG : ");

scanf("%d",&M.mcost);

printf("Enter the cost of Watermelon per KG : ");

scanf("%d",&W.wcost);

printf("Enter the weight of Apples : ");

scanf("%f",&A.a);

printf("Enter the weight of Oranges : ");

scanf("%f",&O.o);

printf("Enter the weight of Mangoes : ");

scanf("%f",&M.m);

printf("Enter the weight of Watermelons : ");

scanf("%f",&W.w);

printf("Cost of Apples : %.2f\n",(float)A.acost\*A.a);

printf("Cost of Oranges : %.2f\n",(float)O.ocost\*O.o);

printf("Cost of Mangoes : %.2f\n",(float)M.mcost\*M.m);

printf("Cost of Watermelons : %.2f\n",(float)W.wcost\*W.w);

printf("Total cost of all fruits : %.2f",(float)A.acost\*A.a+(float)O.ocost\*O.o+

(float)M.mcost\*M.m+(float)W.wcost\*W.w);

return 0;

}

**EXERCISE - 9**

**1.Write a C Program to store Student Details (Name,Admission Number,Register Number,Age,Degree,Year of Graduation) in a structure and access the elements using a pointer as a structure variable.**

#include<stdio.h>

#include<stdlib.h>

struct student

{

int regno,year;

char name[50],degree[5];

}\*p;

int main()

{

int n,i;

p=(struct student\*)malloc(n\*sizeof(struct student));

printf("Enter the Number of Students : ");

scanf("%d",&n);

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

{

printf("Enter the Name of the Student : ");

scanf("%s",(p+i)->name);

printf("Enter the Register Number of the Student : ");

scanf("%d",&(p+i)->regno);

printf("Enter the Degree : ");

scanf("%s",(p+i)->degree);

printf("Enter the Year of Graduation : ");

scanf("%d",&(p+i)->year);

}

printf("Student Records\n");

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

{

printf("Name : %s\n",(p+i)->name);

printf("Register Number : %d\n",(p+i)->regno);

printf("Degree : %s\n",(p+i)->degree);

printf("Year of Graduation : %d\n",(p+i)->year);

}

return 0;

}

**2) Write a C Program to find the Area of a Rectangle and a Triangle by passing structure to a function.**

#include<stdio.h>

struct area

{

int a,b;

float c;

}r,t;

float rectangle(struct area r);

float triangle(struct area t);

int main()

{

printf("Enter the Length of the Rectangle : ");

scanf("%d",&r.a);

printf("Enter the Breadth of the Rectangle : ");

scanf("%d",&r.b);

printf("The Area of the Rectangle is %.2f\n",rectangle(r));

printf("Enter the Base of the Triangle : ");

scanf("%d",&t.a);

printf("Enter the Height of the Triangle : ");

scanf("%d",&t.b);

printf("The Area of the Triangle is %.2f\n",triangle(t));

return 0;

}

float rectangle(struct area r)

{

r.c=(r.a)\*(r.b);

return r.c;

}

float triangle(struct area t)

{

t.c=0.5\*(t.a)\*(t.b);

return t.c;

}

**3) Write a C Program to get Book Details and Publication year and print the books published after the given year.**

#include<stdio.h>

#include<stdlib.h>

struct library

{

char title[200],author[200];

int year;

}\*p,s[100];

int main()

{

int n,i,y;

printf("Enter the Number of Books : ");

scanf("%d",&n);

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

{

printf("Enter the Title of the Book : ");

scanf("%s",s[i].title);

printf("Enter the Author Name : ");

scanf("%s",s[i].author);

printf("Enter the Year of Publication : ");

scanf("%d",&s[i].year);

}

printf("Enter the Year to find the Number of books Published : ");

scanf("%d",&y);

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

{

p=&s[i];

if(p->year>=y)

{

printf("Title : %s\n",p->title);

printf("Author : %s\n",p->author);

printf("Year of Publication : %d\n",p->year);

}

p=p+1;

}

return 0;

}

**EXERCISE - 10**

**1) Write a C Program to count the number of charecters,words and lines in a given text file.**

#include<stdio.h>

#include<stdlib.h>

int main()

{

int c=0,w=0,l=0;

FILE \*fp;

fp=fopen("words.txt","r");

if(fp==NULL)

{

printf("File is not there.");

exit(0);

}

int ch;

ch=getc(fp);

while(ch!=EOF)

{

if(ch=='\n')

{

l++;

w++;

}

else if(ch==' ')

{

w++;

}

c++;

ch=getc(fp);

}

printf("The given file contains %d characters, %d words and %d lines.",c,w,l);

fclose(fp);

return 0;

}\

**EXERCISE - 11**

**1) Write a C Program to store Student Details in a Binary File.**

#include<stdio.h>

#include<stdlib.h>

struct student

{

char name[100],dept[10];

int y,rollno;

}s,r;

int main()

{

int n,i;

FILE \*fp;

fp=fopen("stu.bin","wb");

if(fp==NULL)

{

printf("File not opened.");

exit(0);

}

printf("Enter the Number of Students : ");

scanf("%d",&n);

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

{

printf("Enter the Name of the Student : ");

scanf("%s",s.name);

printf("Enter the Roll Number : ");

scanf("%d",&s.rollno);

printf("Enter the Department : ");

scanf("%s",s.dept);

printf("Enter the Year of Graduation : ");

scanf("%d",&s.y);

fwrite(&s,sizeof(struct student),1,fp);

}

fclose(fp);

fp=fopen("stu.bin","rb");

printf("Student Details\n");

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

{

fread(&r,sizeof(struct student),1,fp);

printf("Name : %s\n",r.name);

printf("Roll Number : %d\n",r.rollno);

printf("Department : %s\n",r.dept);

printf("Year of Graduation : %d\n",r.y);

}

fclose(fp);

return 0;

}