Parul University Lab Manual

**Program 1**: **Write a program to print "Hello World" without using a semicolon anywhere in the code.**

**Program**:

#include <stdio.h>

int main()

{

if (printf("Hello World"))

{

}

}

**Program 2: Amazon Great Indian Sale**

Amazon the top Ecommerce site has announced its sales for diwali where you wish to upgrade your phone and you got an excellent deal for IPHONE 13 PRO MAX where you get maximum discount in Exchange Scheme Now let’s make it interesting you are supposed to exchange two products/values without third variable Using One liner

**Program:**

#include<stdio.h>

int main()

{

int a,b,temp;

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

b=(a+b)-(a=b);

printf("%d%d",a,b);

}

**Program 3: The bermuda triangle**

There once lived a famous scientist who wished to crack the mystery of bermuda triangle

So he decided to calculate the distance between three areas named Miami, Bermuda and

San Juan

So he came up with concept of a2 + b2 = c2 if this condition works he can decode mystery easily so he needs your help to break this

**Program:**

#include<stdio.h>

#include<math.h>

int main()

{

int a,b,c;

scanf(“%d %d %d”,&a,&b,&c);

a=pow(a,2);

b=pow(b,2);

c=pow(c,2);

if(a+b==c)

{

printf(“ Boom You Did It”);

}

else

{

printf(“Better Luck Next Time”);

}

}

**Program 4: Write a program in C which is a Menu-Driven Program to compute the area of the various geometrical shape**

**Program:**

#include<conio.h>

#include <stdio.h>

void main ()

{

int choice,r,l,w,b,h;

float area;

clrscr();

printf("Input 1 for area of circle\n");

printf("Input 2 for area of rectangle\n");

printf("Input 3 for area of triangle\n");

printf("Input your choice : ");

scanf("%d",&choice);

switch(choice)

{

**case 1:**

printf("Input radious of the circle : ");

scanf("%d",&r);

area=3.14\*r\*r;

Break;

**case 2:**

printf("Input length and width of the rectangle : "); scanf("%d%d",&l,&w);

area=l\*w;

break;

**case 3:**

printf("Input the base and hight of the triangle :");

scanf("%d%d",&b,&h);

area=0.5\*b\*h;

break;

}

printf("The area is : %f\n",area);

getch();

}

**Program 5: Egyptian pyramids**

**Pyramids which are considered as most stable structures in world is based on geometry of triangle and you are assigned a task of printing a stable triangular structure**

**Sample Input :**

3

**Sample Output:**

\*

\* \* \*

\* \* \* \* \*

**Program:**

#include<stdio.h>

#include<conio.h>

void main()

{

int i,j,k;

for(i=1; i<=5; i++)

{

for(j=4; j>=i; j--)

{

printf(" ");

}

for(k=1; k<=(2\*i-1); k++)

{

printf("\*");

}

printf("\n");

}

}

**Program 6: Diamonds and Black Market**

**There is illegal trading going on in black market so they have to sell diamonds in black market but just because of cops they can't sell it directly in the market so they decided to use softwares to share virtual images of those things to get appropriate consignments just to print diamond shape structure.**

**Input format:**

Read n value as input

**Output format:**

Print diamond depends on value

**Sample Input :**

3

**Sample Output:**

\*

\*\*\*

\*\*\*\*\*

\*\*\*

\*

**Input 1:**

4

**Output 1:**

\*

\*\*\*

\*\*\*\*\*

\*\*\*\*\*\*\*

\*\*\*\*\*

\*\*\*

\*

**Program**:

#include <stdio.h>

int main()

{

int i,j,n;

printf("Enter number of rows: ");

scanf("%d",&n);

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

{

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

{

printf(" ");

}

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

{

printf("\*");

}

printf("\n");

}

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

{

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

{

printf(" ");

}

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

{

printf("\*");

}

printf("\n");

}

}

**Program 7: write a program to find the prime number in a given interval range.**

#include <stdio.h>

int main() {

int low, high, i, flag;

printf("Enter two numbers(intervals): ");

scanf("%d %d", &low, &high);

printf("Prime numbers between %d and %d are: ", low, high);

// iteration until low is not equal to high

while (low < high) {

flag = 0; // ignore numbers less than 2

if (low <= 1) {

++low;

continue;

}

for (i = 2; i <= low / 2; ++i)

{

if (low % i == 0)

{

flag = 1;

Break;

}

}

if (flag == 0)

printf("%d ", low);

++low;

}

return 0;

}

**Program 8: Magical Mathematics**

**Maths is always a magical so there is trick which goes like this take a integer number and need to perform factorials of every digit and sum of that factorials of digits should give you same input integer number**

**Program:**

#include<stdio.h>

int main(){

int n,i;

int fact,rem;

scanf("%d",&n);

int sum = 0;

int temp = n;

while(n){

i = 1,fact = 1;

rem = n % 10;

while(i <= rem){

fact = fact \* i;

i++;

}

sum = sum + fact;

n = n / 10;

}

if(sum == temp)

printf("\nYes");

else

printf("\nNo");

}

**Program 9: Time Conversions:**

**Mr X is an employee in an organization where his Boss is from the USA. There was a situation to interact with his Boss and has to create an event now he got confused with time delay between USA and India help him to get the time converted into PM or AM According to Inpu**t

**Input Format:**

Input is time in an 12 -hr AM / PM format(hh:mm:ss:AM/PM)

**Output Format:**

Output should be in 24 hr format(military format)

**Sample Input:**

12:00:00AM

**Sample Output:**

00:00:00PM

**Program:**

#include <stdio.h>

#include <string.h>

#include <math.h>

#include <stdlib.h>

int main() {

int hh, mm, ss, HH, MM, SS;

char T, M;

scanf("%d:%d:%d%c%c", &hh, &mm, &ss, &T, &M);

if(T=='P')

{

if(hh==12)

{

printf("12:%.2d:%.2d\n", mm, ss);

}

else

{

printf("%.2d:%.2d:%.2d\n", hh + 12, mm, ss);

}

}

else if(T=='A')

{

if(hh==12)

{

printf("00:%.2d:%.2d\n", mm, ss);

}

else{

printf("%.2d:%.2d:%.2d\n", hh, mm, ss);

}

}

}

**Program 10: Min element of an array from given input array elements**

**Program:**

#include<stdio.h>

#include<conio.h>

int main()

{

int a[100],min,s,c,loc=1;

clrscr();

printf("Enter the number of elements in array\n");

scanf("%d",&s);

printf("Enter the %dinteger values\n",s);

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

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

min=a[0];

for(c=1;c<s;c++)

{

if(a[c]<min)

{

min=a[c];

loc=c+1;

}

}

printf("The minimum element is present at location

is%d and it's value %d\n",loc,min);

getch();

return 0;

}

**Program 11: Find average and rank of a student for given input marks using functions**

**Program:**

#include<stdio.h>

#include<conio.h>

int total(int,int,int);

float average(int);

int main()

{

int s1,s2,s3,tot;

float avg;

clrscr();

printf("Enter the values for s1,s2,s3\n");

scanf("%d%d%d",&s1,&s2,&s3);

printf("The value of three subjects is %d%d%d\n",s1,s2,s3);

tot=total(s1,s2,s3);/\*function declaration\*/

avg=average(tot);

printf("The average of 3 subjects is\t %f\n",avg);

if(avg>75&&avg<100)

{

printf("First Rank");

}

else if(avg>50&&avg<75)

{

printf("Second Rank");

}

else if(avg>35&&avg<50)

{

printf("Third Rank");

}

else

{

printf("Fail");

}

getch();

return 0;

}

int total(int a,int b ,int c)/\*function definition\*/

{

int tot1;

tot1=a+b+c;

printf("the total is%d\n",tot1);

return tot1;

}

float average(int x)

{

float avg1;

avg1=x/3;

return avg1;

}

**Program 12: Find Factorial value between the range from 1 and 20**

**Program:**

#include<stdio.h>

#include<conio.h>

int fact,y;

char answer;

int factorial(int a);

void main()

{

do

{

answer='y';

printf("Enter an integer value between 1 and 20: ");

scanf("%d",&y);

if(y > 20 || y<1)

{

printf("Only values between 1 and 20 are acceptable!\n");

}

else

{

fact = factorial(y);

printf("%d factorial equals %d\n",y,fact);

}

printf("\nDo you want to continue (Y/N)? ");

answer=getch();

}while (answer=='y' || answer=='Y');

}

int factorial(int a) /\*function to calculate factorial\*/

{

if (a == 1)

return 1;

else

{

a \*=factorial(a-1);

return a; /\* returns int value to program \*/

}

}

**Program 13:Max element from given array using Pointers**

**Program:**

#include<stdio.h>

#include<conio.h>

int main()

{

int a[100],\*max,s,c,loc=1;

clrscr();

printf("Enter the number of elements in array\n");

scanf("%d",&s);

printf("Enter %dintegers\n",s);

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

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

max=a;

\*max=\*a;

for(c=1;c<s;c++)

{

if(\*(a+c)>\*max)

{

\*max=\*(a+c);

loc=c+1;

}

}

printf("Maximium element is persent at

location %d and it's value is%d\n",loc,\*max);

getch();

return 0;

}

**Program 14: Display frequency count vowels, consonants, digits and spaces**

**Program:**

#include <stdio.h>

int main()

{

char line[150];

int vowels, consonant, digit, space;

vowels = consonant = digit = space = 0;

printf("Enter a line of string: ");

fgets(line, sizeof(line), stdin);

for (int i = 0; line[i] != '\0'; ++i)

{

if (line[i] == 'a' || line[i] == 'e' || line[i] == 'i' ||

line[i] == 'o' || line[i] == 'u' || line[i] == 'A' ||

line[i] == 'E' || line[i] == 'I' || line[i] == 'O' ||

line[i] == 'U')

{

++vowels;

}

else if ((line[i] >= 'a' && line[i] <= 'z') || (line[i] >= 'A' && line[i] <= 'Z'))

{

++consonant;

}

else if (line[i] >= '0' && line[i] <= '9')

{

++digit;

}

else if (line[i] == ' ')

{

++space;

}

}

printf("Vowels: %d", vowels);

printf("\nConsonants: %d", consonant);

printf("\nDigits: %d", digit);

printf("\nWhite spaces: %d", space);

return 0;

}

**Program 15: Swap two strings using pointers**

**Program:**

#include<stdio.h>

void swap(char \*str1, char \*str2)

{

char \*temp = str1;

str1 = str2;

str2 = temp;

}

int main()

{

char \*str1 = "geeks";

char \*str2 = "forgeeks";

swap(str1, str2);

printf("str1 is %s, str2 is %s", str1, str2);

getchar();

return 0;

}

**Program 16: Write a program to implement Dynamic memory functions**

**Program:**

//Malloc function

#include<stdio.h>

#include<stdlib.h>

int main(){

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

printf("Enter number of elements: ");

scanf("%d",&n);

ptr=(int\*)malloc(n\*sizeof(int)); //memory allocated using malloc

if(ptr==NULL)

{

printf("Sorry! unable to allocate memory");

exit(0);

}

printf("Enter elements of array: ");

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

{

scanf("%d",ptr+i);

sum+=\*(ptr+i);

}

printf("Sum=%d",sum);

free(ptr);

return 0;

}

// calloc function

#include<stdio.h>

#include<stdlib.h>

int main(){

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

printf("Enter number of elements: ");

scanf("%d",&n);

ptr=(int\*)calloc(n,sizeof(int)); //memory allocated using calloc

if(ptr==NULL)

{

printf("Sorry! unable to allocate memory");

exit(0);

}

printf("Enter elements of array: ");

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

{

scanf("%d",ptr+i);

sum+=\*(ptr+i);

}

printf("Sum=%d",sum);

free(ptr);

return 0;

}

//realloc function

#include <stdio.h>

#include <stdlib.h>

int main()

{

int\* ptr;

int n, i;

n = 5;

printf("Enter number of elements: %d\n", n);

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

if (ptr == NULL) {

printf("Memory not allocated.\n");

exit(0);

}

else {

printf("Memory successfully allocated using calloc.\n");

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

ptr[i] = i + 1;

}

printf("The elements of the array are: ");

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

printf("%d, ", ptr[i]);

}

n = 10;

printf("\n\nEnter the new size of the array: %d\n", n);

ptr = realloc(ptr, n \* sizeof(int));

printf("Memory successfully re-allocated using realloc.\n");

for (i = 5; i < n; ++i) {

ptr[i] = i + 1;

}

printf("The elements of the array are: ");

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

printf("%d, ", ptr[i]);

}

free(ptr);

}

return 0;

}

**Program 17: Structure of book information (title author publications house) with using functions**

**Program:**

#include<stdio.h>

#include<conio.h>

#include<string.h>

struct books

{

char title[50];

char author[50];

char subject[50];

int bookid;

}b1,b2;

void printbook(struct books b);/\*prototype\*/

int main()

{

//struct books b1;

//struct books b2;

clrscr();

strcpy(b1.title,"c Language");

strcpy(b1.author,"Bal guruswamy");

strcpy(b1.subject,"c tutorial");

b1.bookid=83463;

strcpy(b2.title,"c++ Langauage");

strcpy(b2.author,"zara ali");

strcpy(b2.subject,"c++ tutorial");

b2.bookid=653436;

printbook(b1);/\*function declaration\*/

printbook(b2);

getch();

return 0;

}

void printbook(struct books b)/\* function definition\*/

{

printf("Book Title:%s\n",b.title);

printf("Book Author:%s\n",b.author);

printf("Book subject:%s\n",b.subject);

printf("Book BookId:%d\n",b.bookid);

}

**Program 18: Structure of book information (title author publications house) with using pointers**

**Program:**

#include<stdio.h>

#include<conio.h>

#include<string.h>

struct books

{

char title[50];

char author[50];

char subject[50];

int bookid;

};

void printbook(struct books \*b);

int main()

{

struct books b;

clrscr();

strcpy(b.title,"C Lnguage");

strcpy(b.author,"bala guruswamy");

strcpy(b.subject,"c tutorial");

b.bookid=8746374;

printbook(&b);

getch();

return 0;

}

void printbook(struct books \*b)

{

printf("The Title is %s:\n",b->title);

printf("The author is:%s\n",b->author);

printf("The subjects are %s\n",b->subject);

printf("The book id is",b->bookid);

}

**Program 19: Unions**

**Write a program to observe the memory difference between structures and unions**

Sample Input and output:

size of union : 32 bytes

size of structure : 40 bytes

**Program:**

#include <stdio.h>

union u1

{

char x[32];

float b;

int c;

} uvar;

struct s1

{

char a[32];

float b;

int c;

} svar;

int main()

{

printf("size of union = %d bytes", sizeof(uvar));

printf("\nsize of structure = %d bytes", sizeof(svar));

return 0;

}

**Program 20: Write a program to create a union of website and course and its fees and display all union members**

**Sample Input and output :**

WebSite : login.Bytexl.in

Subject : Principles of Programming

Price : 1000

**Program:**

#include<stdio.h>

#include<string.h>

union ParulUniversity

{

char WebSite[50];

char Subject[50];

int Price;

};

void main( )

{

union ParulUniversity PU;

strcpy( PU.WebSite, "login.Bytexl.in");

printf( "WebSite : %s\n", PU.WebSite);

strcpy(PU.Subject,"Principles of Programming");

printf( "Subject : %s\n", PU.Subject);

PU.Price=1000;

printf( "Price : %d\n", PU.Price);

}

**Program 21: Write a program for creating a file of employee name and salary**

**Program:**

#include <stdio.h>

void main()

{

FILE \*fptr;

int id;

char name[30];

float salary;

fptr = fopen("D:\\bytexl.txt", "w+");

if (fptr == NULL)

{

printf("File does not exists \n");

return;

}

printf("Enter the id\n");

scanf("%d", &id);

fprintf(fptr, "Id= %d\n", id);

printf("Enter the name \n");

scanf("%s", name);

fprintf(fptr, "Name= %s\n", name);

printf("Enter the salary\n");

scanf("%f", &salary);

fprintf(fptr, "Salary= %.2f\n", salary);

fclose(fptr);

}