**Programs**

**If statement**

**Example 1: C program to print the square of a number if it is less than 10.**

#include<stdio.h>

int main()

{

int n;

printf("Enter a number:");

scanf("%d",&n);

if(n<10)

{

printf("%d is less than 10\n",n);

printf("Square = %d\n",n\*n);

}

return 0;

}

**Example 2:**

#include <stdio.h>

int main() {

int i = 10;

if (i > 15)

{

printf("10 is less than 15");

}

printf("I am Not in if");

return 0;

}

**Example 3: Program to display a number if it is negative**

#include<stdio.h>

int main() {

int number;

printf("Enter an integer: ");

scanf("%d", &number);

if (number < 0) {

printf("You entered %d.\n", number);

}

printf("Program ends.");

return 0;

}

**If-else statements**

**Example1: C program to find if a number is odd or even.**

#include<stdio.h>

int main()

{

int n;

printf("Enter a number:");

scanf("%d",&n);

if(n%2 == 0)

printf("%d is even",n);

else

printf("%d is odd",n);

return 0;

}

**Example 2: WAP to display the largest from two numbers**

#include<stdio.h>

int main()

{

int a, b;

printf("Enter any two number: ");

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

if(a>b)

{

printf("\n Largest is:%d",a);

}

else

{

printf("\n Largest is:%d",b);

}

return 0;

}

**Example 3: WAP to check whether a person is eligible to vote or not**

#include<stdio.h>

int main()

{

int age ;

printf("Enter the age of the person: ");

scanf("%d",&age);

//check voting eligibility

if (age>=18)

{

printf("\n Eligible for voting");

}

else

{

printf("\n Not Eligible for voting");

}

return 0;

}

**Example 4: WAP to check whether a given character is vowel or not**

#include <stdio.h>

int main()

{

char ch;

printf("Enter a character\n");

scanf("%c", &ch);

if (ch == 'a' || ch == 'A' || ch == 'e' || ch == 'E' || ch == 'i' || ch == 'I' || ch =='o' || ch=='O' || ch == 'u' || ch == 'U')

printf("%c is a vowel.\n", ch);

else

printf("%c is not a vowel.\n", ch);

return 0;

}

**Example 5: WAP to check whether a number is a multiple of 5 or not**

#include<stdio.h>

int main()

{

int n;

printf("\nEnter number:");

scanf("%d",&n);

if(n%5==0)

{

printf("\n Entered number is a multiple of 5");

}

else

{

printf("\n Entered number is not a multiple of 5");

}

return 0;

}

**Example 6: WAP to enter any character. If the entered character is in lower case then convert it into upper case**

#include<stdio.h>

int main()

{

char ch;

printf("\nEnter character:");

scanf("%c",&ch);

if(ch>=97 && ch<=122)

{

ch=ch-32;

printf("\n Character in uppercase is:%c",ch);

}

else

{

printf("\n Entered character is already in uppercase");

}

return 0;

}

**Example 7: WAP to enter any character. If the entered character is in upper case then convert it into lower case**

#include<stdio.h>

int main()

{

char ch;

printf("\nEnter character:");

scanf("%c",&ch);

if(ch>=65 && ch<=90)

{

ch=ch+32;

printf("\n Character in lowercase is:%c",ch);

}

else

{

printf("\n Entered character is already in lowercase");

}

return 0;

}

**Example 7:WAP to check whether a given number is divisible by 7 and 9 (both)or not**

#include<stdio.h>

int main()

{

int num;

printf("\nEnter any number:");

scanf("%d",&num);

if(num%7==0 && num%9==0)

{

printf("\n Number is divisible by 7 and 9 both");

}

else

{

printf("\n Number is not divisible by 7 and 9 both");

}

return 0;

}

**if-else-if / or if-else-if ladder**

**Example 1: WAP to check whether a given integer is –ve,+ve or zero**

#include <stdio.h>

int main()

{

int num;

printf ("Enter a number \n");

scanf ("%d", &num);

if (num > 0)

{

printf ("You have entered positive number");

}

else if (num < 0)

{

printf ("You have entered negative number");

}

else

{

printf ("You have entered zero");

}

return 0;

}

**Example 2: WAP to display greatest of three numbers**

#include <stdio.h>

int main()

{

int A, B, C;

printf("Enter three numbers: ");

scanf("%d %d %d", &A, &B, &C);

if (A > B && A > C)

printf("%d is the largest number.", A);

else if (B > A && B > C)

printf("%d is the largest number.", B);

else

printf("%d is the largest number.", C);

return 0;

}

**Example 3: WAP to calculate the roots of a quadratic equation**

#include <math.h>

#include <stdio.h>

int main() {

double a, b, c, discriminant, root1, root2, realPart, imagPart;

printf("Enter coefficients a, b and c: ");

scanf("%lf %lf %lf", &a, &b, &c);

discriminant = b \* b - 4 \* a \* c;

// condition for real and different roots

if (discriminant > 0) {

root1 = (-b + sqrt(discriminant)) / (2 \* a);

root2 = (-b - sqrt(discriminant)) / (2 \* a);

printf("root1 = %.2lf and root2 = %.2lf", root1, root2);

}

// condition for real and equal roots

else if (discriminant == 0) {

root1 = root2 = -b / (2 \* a);

printf("root1 = root2 = %.2lf;", root1);

}

// if roots are not real

else {

realPart = -b / (2 \* a);

imagPart = sqrt(-discriminant) / (2 \* a);

printf("root1 = %.2lf+%.2lfi and root2 = %.2f-%.2fi", realPart, imagPart, realPart, imagPart);

}

return 0;

}

**Example 4: WAP to check whether a given year is leap year or not**

#include <stdio.h>

int main() {

int year;

printf("Enter a year: ");

scanf("%d", &year);

// leap year if perfectly visible by 400

if (year % 400 == 0) {

printf("%d is a leap year.", year);

}

// not a leap year if visible by 100

// but not divisible by 400

else if (year % 100 == 0) {

printf("%d is not a leap year.", year);

}

// leap year if not divisible by 100

// but divisible by 4

else if (year % 4 == 0) {

printf("%d is a leap year.", year);

}

// all other years are not leap year

else {

printf("%d is not a leap year.", year);

}

return 0;

}

**Practice questions:**

* WAP to enter the marks of a student in four subjects. Then calculate the total, aggregate, and display the final grade obtained by the student. Assume conditions like:

if aggregate is greater than and equal to 90-----A grade,

>=80 and <90-----B grade,

>=70 and <80-----C grade,

>=40 and <70------D grade

Less than 40------E grade

#include<stdio.h>

int main()

{

float m1,m2,m3,m4,m5,total,percent;

printf("\n Enter marks in five subjects:");

scanf("%f%f%f%f%f",&m1,&m2,&m3,&m4,&m5);

total=m1+m2+m3+m4+m5;

percent=(total\*100.0)/500.0;

if(percent>=90.0)

{

printf("\nA grade");

}

else if(percent>=80.0 && percent<90.0)

{

printf("\nB grade");

}

else if(percent>=70.0 && percent<80.0)

{

printf("\nC grade");

}

else if(percent>=40.0 && percent<70.0)

{

printf("\nD grade");

}

else

{

printf("\n E grade");

}

return 0;

}

* WAP to calculate tax, given the following conditions:

If income is less than 150,000, then no tax

If income in the range of 150,001-300,000, then charge 10% tax

If income is in the range of 300,001-500,000, then charge tax of 20%

If income is above 500,001, then charge tax of 30%

#include<stdio.h>

int main()

{

float income,tax=0.0;

printf("\n Enter income:");

scanf("%f",&income);

if(income<150000.0)

{

printf("\nNo tax");

}

else if(income>=150001.0 && income<=300000.0)

{

tax=(income\*10.0)/100.0;

}

else if(income>=300001.0 && income<=500000.0)

{

tax=(income\*20.0)/100.0;

}

else if(income>=500000.0)

{

tax=(income\*30.0)/100.0;

}

printf("\n Final tax to pay is:%f",tax);

return 0;

}

**Nested if…..followed by else (if inside if)**

**Example 1:Greatest of three numbers**

#include <stdio.h>

int main()

{

int A, B, C;

printf("Enter three numbers: ");

scanf("%d %d %d", &A, &B, &C);

if (A > B) {

if (A > C)

printf("%d is the largest number.", A);

else

printf("%d is the largest number.", C);

}

else {

if (B > C)

printf("%d is the largest number.", B);

else

printf("%d is the largest number.", C);

}

return 0;

}

**Example 2:**

#include <stdio.h>

int main()

{

int var1, var2;

printf("Input the value of var1:");

scanf("%d", &var1);

printf("Input the value of var2:");

scanf("%d",&var2);

if (var1 != var2)

{

printf("var1 is not equal to var2\n");

//Nested if else

if (var1 > var2)

{

printf("var1 is greater than var2\n");

}

else

{

printf("var2 is greater than var1\n");

}

}

else

{

printf("var1 is equal to var2\n");

}

return 0;

}

switch statement

**Example 1: Simple calculator using switch**

#include <stdio.h>

int main() {

char operator;

double n1, n2;

printf("Enter an operator (+, -, \*, /): ");

scanf("%c", &operator);

printf("Enter two operands: ");

scanf("%lf %lf",&n1, &n2);

switch(operator)

{

case '+':

printf("%.1lf + %.1lf = %.1lf",n1, n2, n1+n2);

break;

case '-':

printf("%.1lf - %.1lf = %.1lf",n1, n2, n1-n2);

break;

case '\*':

printf("%.1lf \* %.1lf = %.1lf",n1, n2, n1\*n2);

break;

case '/':

printf("%.1lf / %.1lf = %.1lf",n1, n2, n1/n2);

break;

// operator doesn't match any case constant +, -, \*, /

default:

printf("Error! operator is not correct");

}

return 0;

}

**Example 2: C program to print day of week using switch case**

#include <stdio.h>

int main()

{

int week;

/\* Input week number from user \*/

printf("Enter week number(1-7): ");

scanf("%d", &week);

switch(week)

{

case 1:

printf("Monday");

break;

case 2:

printf("Tuesday");

break;

case 3:

printf("Wednesday");

break;

case 4:

printf("Thursday");

break;

case 5:

printf("Friday");

break;

case 6:

printf("Saturday");

break;

case 7:

printf("Sunday");

break;

default:

printf("Invalid input! Please enter week number between 1-7.");

}

return 0;

}

**Example 3: Program to check whether a given character is vowel or not using switch-case**

**Solution 1:**

#include <stdio.h>

int main()

{

char ch;

/\* Input an alphabet from user \*/

printf("Enter any alphabet: ");

scanf("%c", &ch);

/\* Switch value of ch \*/

switch(ch)

{

case 'a':

printf("Vowel");

break;

case 'e':

printf("Vowel");

break;

case 'i':

printf("Vowel");

break;

case 'o':

printf("Vowel");

break;

case 'u':

printf("Vowel");

break;

case 'A':

printf("Vowel");

break;

case 'E':

printf("Vowel");

break;

case 'I':

printf("Vowel");

break;

case 'O':

printf("Vowel");

break;

case 'U':

printf("Vowel");

break;

default:

printf("Not a vowel");

}

return 0;

}

**Solution 2:**

#include <stdio.h>

int main()

{

char ch;

/\* Input alphabet from user \*/

printf("Enter any character: ");

scanf("%c", &ch);

/\* Switch ch value \*/

switch(ch)

{

case 'a':

case 'e':

case 'i':

case 'o':

case 'u':

case 'A':

case 'E':

case 'I':

case 'O':

case 'U':

printf("Vowel");

break;

default:

printf("Not a vowel");

}

return 0;

}

**Example 4: Menu driven area calculator using switch case**

#include<stdio.h>

int main () {

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

float area;

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

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

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

printf("enter your choice\n");

scanf("%d",&ch);

switch(ch) {

case 1:

printf("enter radius of circle\n");

scanf("%d",&r);

area=3.14\*r\*r;

break;

case 2:

printf("enter length and width\n");

scanf("%d%d",&l,&w);

area=l\*w;

break;

case 3:

printf("enter the base and height\n");

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

area=.5\*b\*h;

break;

default:

printf("\n Wrong choice");

break;

}

printf("area is=%f",area);

}

**Practice questions:**

WAP to create perimeter calculator for different mathematical shapes using switch case [Program should display menu, and based on that user will enter choice in integer, and further perimeters will be calculated

WAP to create a menu driven currency converter, where the menu will be displayed, such as Press 1 for INR to dollar, Press 2 for Dollar to INR, Press 3 for Pounds to INR, Press 4 for INR to Pounds….. User will enter choice and later conversion should happen