Programs for Computational Mathematics I Practical (PROLOG)

Program to find the area of different shapes
Created by: Ankit Gupta - ankitg1689@gmail.com

```
Predicates
  main
  action(integer)
  cir(real)
  rect(real,real)
  cube(real)
  triangle(real,real)

Clauses
  main:-
    ClearWindow,

    write("\nFind out the"),
    write("\n1.Area of Circle"),
    write("\n2.Area of Rectangle"),
    write("\n3.Area of Triangle"),
    write("\n4.Area of Cube"),
    write("\n5.Quit"),
    write("\nEnter your choice:"),
    readint(X),
    action(X),

    write("\nDo you want to continue(Y/N)"),
    readchar(CH),

    CH='Y',
       main,
    CH='N',
       exit.

  action(1):-
    ClearWindow,
    write("\nEnter radius of circle:"),
    readreal(R),
    cir(R),!.

  action(2):-
    ClearWindow,
    write("\nEnter length of rectangle:"),
    readreal(L),
    write("\nEnter breadth of rectangle:"),
    readreal(H),
    rect(L,H),!.

  action(3):-
    ClearWindow,
    write("\nEnter base length of triangle:"),
    readreal(B),
    write("\nEnter height of triangle:"),
    readreal(HL),
    triangle(B,HL),!.
```

```
action(4):-
  ClearWindow,
  write("\nEnter side of cube:"),
  readreal(S),
  cube(S),!.

action(5):-
  exit.

action(X):-
  X<>1,
  X<>2,
  X<>3,
  X<>4,
  X<>5,
  write("\nWrong Choice"),!.


cir(R):-
  A=3.14*R*R,
  write("\nArea of Circle:",A),!.

rect(L,H):-
  A1=L*H,
  write("\nArea of Rectangle:",A1),!.

triangle(B,HL):-
  A2=0.5*B*HL,
  write("\nArea of triangle:",A2),!.

cube(S):-
  A3=S*S*S,
  write("\nArea of Cube:",A3).
```

Program to check a number is Armstrong or not
Created by: Ankit Gupta - ankitg1689@gmail.com

```
Predicates
  main
  arms(integer,integer,integer)

Clauses
  main:-
    ClearWindow,
    write("\nEnter any number:"),
    readint(N),
    arms(N,0,N),
    write("\nDo you want to continue(Y/N)"),
    readchar(CH),
    CH='Y',
    main,
    CH='N',
    exit.

  arms(N,S,X):-
    N>0,
    A=N mod 10,
    S1=S+A*A*A,
    P=N div 10,
    arms(P,S1,X),!.

  arms(_,S1,X):-
    S1=X,
    write("\nGiven number is armstrong number"),!.

  arms(_,S1,X):-
    S1<>X,
    write("\nGiven number is not a armstrong number").
```

Program to check divisibility

Created by: Ankit Gupta - ankitg1689@gmail.com

```
Predicates
  main
  divisible(integer,integer)

Clauses
  main:-
    ClearWindow,
    write("\nEnter first number:"),
    readint(X),
    write("\nEnter second number:"),
    readint(Y),
    divisible(X,Y).

  divisible(X,Y):-
    X mod Y=0,
    write("\nFirst number is divisible by second number"),!.

  divisible(Y,X):-
    X mod Y<>0,
    write("\nFirst number is not divisible by second number").
```

Program to check a number is even or odd

Created by: Ankit Gupta - ankitg1689@gmail.com

```
Predicates
  main
  oddeven(integer,integer)

Clauses
  main:-
    ClearWindow,
    write("\nEnter the number:"),
    readint(N),
    R=N mod 2,
    oddeven(N,R).

  oddeven(_,A):-
    A=0,
    write("\nNumber is even").

  oddeven(_,B):-
    B<>0,
    write("\nNumber is odd").
```

Program to find the factorial of a number
Created by: Ankit Gupta - ankitg1689@gmail.com

```
Predicates
  main
  fact(integer,integer)

Clauses
  main:-
    ClearWindow,
    write("\nEnter any number:"),
    readint(N),
    fact(N,1).

  fact(N,F):-
    Y>0,
    X=F*N,
    Y=N-1,
    fact(Y,X),!.

  fact(_,F):-
    write("\nFactorial is:",F).
```

Program to calculate grades of student based on marks division

Created by: Ankit Gupta - ankitg1689@gmail.com

```
Predicates
  main
  check(integer)

Clauses
  main:-
    ClearWindow,
    write("\nEnter marks in IP:"),
    readint(P),
    write("\nEnter marks in Maths:"),
    readint(Q),
    write("\nEnter marks in AI:"),
    readint(R),
    Tot=P+Q+R,
    PER=Tot/3,
    write("\nTotal marks:",Tot),
    write("\nPercentage:",PER,"%"),
    check(PER).

  check(A):-
    A>=70,
    write("\nDistinction"),!.

  check(A):-
    A>=60 and A<70,
    write("\nFirst Class"),!.

  check(A):-
    A>=40 and A<60,
    write("\nPass"),!.

  check(A):-
    A<40,
    write("\nFail try again...").
```

Program to check palindrome

Created by: Ankit Gupta - ankitg1689@gmail.com

```
Predicates
  main
  rev(integer,integer,integer)

Clauses
  main:-
    ClearWindow,
    write("\nEnter any number:"),
    readint(N),
    rev(N,0,N).

  rev(N,D,P):-
    N>0,
    C=N mod 10,
    H=D*10+C,
    X=N div 10,
    rev(X,H,P).

  rev(0,H,P):-
    P=H,
    write("\nReverse Number:",H),
    write("\nGiven Number is Palindrome").

  rev(0,H,P):-
    P<>H,
    write("\n Reverse No",H),
    write("\n Given No is not Palindrome").
```

Program to solve a quadratic equations

Created by: Ankit Gupta - ankitg1689@gmail.com

```
Predicates
  main
  quadroot(real,real,real)
  equal(real,real)
  sol(real,real,real,real)

Clauses
  main:-
    ClearWindow,
    write("\nEnter A="),
    readreal(A),
    write("\nEnter B="),
    readreal(B),
    write("\nEnter C="),
    readreal(C),
    quadroot(A,B,C),
    write("\nDo you want to continue(Y/N)"),
    readchar(CH),
    CH='Y',
    main,
    CH='N',
    exit.

  quadroot(A,B,C):-
    D=(B*B)-(4*A*C),
    sol(A,B,C,D),!.

  sol(_,_,_,D):-
    D<0,
    write("\nRoot are Imaginary"),!.

  sol(A,B,_,D):-
    X1=(-B+sqrt(D))/2*A,
    X2=(-B-sqrt(D))/2*A,
    write("\nX1=",X1),
    write("\nX2=",X2),!.

  equal(X1,X2):-
    X1=X2,
    write("\nRoots are equal"),!.

  equal(X1,X2):-
    X1<>X2,
    write("\nRoots are real").
```

Program to find the sum of digits

Created by: Ankit Gupta - ankitg1689@gmail.com

```
Predicates
  main
  SumofDgt(integer,integer)

Clauses
  main:-
    Clear Window,
    write("\nEnter any number"),
    readint(N),
    SumofDgt(N,0),
    write("\nDo you want to continue(Y/N)"),
    readchar(CH),
    CH='Y',
    main,
    CH='N',
    exit.

  SumofDgt(N,S):-
    N>0,
    R=N mod 10,
    Y=S+R,
    X=N div 10,
    SumofDgt(X,Y),!.

  SumofDgt(0,Y):-
    write("\nSum of Digits is:",Y).
```

Program to find the sum of natural numbers
Created by: Ankit Gupta - ankitg1689@gmail.com

```
Predicates
    main
    sum(integer)

Clauses
main:-
   ClearWindow,
   write("\n Enter last number:"),
   readint(N),
   sum(N).

  sum(N):-
   X=((N*(N-1))/2.0),
   write("The sum is:",X).
```

Program to find the sum of cubes
Created by: Ankit Gupta - ankitg1689@gmail.com

```
Predicates
  main
  sum(integer,integer)

Clauses
  main:-
    ClearWindow,
    write(" \n Enter the  number:"),
    readint(N),
    sum(N,0),
    write(" \n Do you want to continue: (Y/N)" ),
    readchar(CH),
    CH='Y',
    main,
    CH='N',
    exit.

  sum(Y,D):-
    Y<>0,
    C=Y*Y*Y,
    E=D+C,
    F=Y-1,
    sum(F,E),!.

  sum(_,E):-
    write("\n  Sum of series:",E).
```

Program for temperature Conversion

Created by: Ankit Gupta - ankitg1689@gmail.com

```
Predicates
  main
  action(integer)
  convertF(real)
  convertC(real)

Clauses
  main:-
    clearwindow,
    write("\n1.Convert Celcius to Farenheit"),
    write("\n2.Convert Farenheit to Celcius"),
    write("\n3.Quit"),
    write("\nEnter your choice:"),
    readint(X),
    action(X).

  action(1):-
    write("\nRead the temperature in Celcius"),
    readreal(C),
    convertF(C),!.

  action(2):-
    write("\nRead the temperature in Farenheit"),
    readreal(F),
    convertC(F),!.

  action(3):-
    exit.

  action(X):-
    X<>1,
    X<>2,
    X<>3,
    write("\nWrong Choice"),!.

  convertC(F):-
    C=5*(F-32)/9,
    write("\nCelcius is:",C),!.

  convertF(C):-
    F=C*9/5+32,
    write("\nFarenheit is:",F),!.
```

Ankit Gupta
ankitg1689@gmail.com