**Loop related problems (total 20 questions)**

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| **SL** | **Problem statement** | **Difficulty levels** |
|  | Write a program (WAP) that will print following series upto Nth terms.  1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, …….   |  |  | | --- | --- | | ***Sample input*** | ***Sample output*** | | 2 | 1, 2 | | 5 | 1, 2, 3, 4, 5 | | 11 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 |   #include <stdio.h>  int main(){  int n,i;  printf("Enter nth number ");  scanf("%d",&n);  for(i=1;i<=n;i++)  printf("%d,",i);  return 0;  } | **\*** |
|  | Write a program (WAP) that will print following series upto Nth terms.  1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31 …….   |  |  | | --- | --- | | ***Sample input*** | ***Sample output*** | | 2 | 1, 3 | | 5 | 1, 3, 5, 7, 9 | | 11 | 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21 |   **#include <stdio.h>**  **int main(){**  **int n,i;**  **printf("Enter nth number ");**  **scanf("%d",&n);**  **for(i=1;i<=n;i=i+2)**  **printf("%d,",i);**  **return 0;**  **}** | **\*** |
|  | Write a program (WAP) that will print following series upto Nth terms.  1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, …….   |  |  | | --- | --- | | ***Sample input*** | ***Sample output*** | | 1 | 1 | | 2 | 1, 0 | | 3 | 1, 0, 1 | | 4 | 1, 0, 1, 0 | | 7 | 1, 0, 1, 0, 1, 0, 1 | | 13 | 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1 |   **#include <stdio.h>**  **int main(){**  **int n,i;**  **printf("Enter nth number ");**  **scanf("%d",&n);**  **for(i=1;i<=n;i++){**  **if (i%2==0){**  **printf("0,");**  **}**  **else{**  **printf("1,");**  **}**  **}**  **return 0;**  **}** | **\*\*** |
|  | Write a program (WAP) that will take **N** numbers as inputs and compute their average.  (**Restriction:** Without using any array)  #include <stdio.h>  int main(){  int i,n,num;  float sum=0,avg;  printf("enter nth number\n");  scanf("%d",&n);  printf("Enter the numbers\n ");  for(i=0;i<n;i++){  scanf("%d",&num);  sum=sum+num;  }  avg=(float)sum/n;  printf("avg of %d input: %.5f",n,avg);  return 0;  }   |  |  | | --- | --- | | ***Sample input*** | ***Sample output*** | | 3  10 20 30.5 | AVG of 3 inputs: 20.166667 | | 2  22.4 11.1 | AVG of 2 inputs: 16.750000 | |  |  | |  |  | | **\*** |
|  | Write a program (WAP) that will take two numbers **X** and **Y** as inputs. Then it willprint the square of **X** and increment (**if X<Y**) or decrement (**if X>Y**) **X** by 1, until **X** reaches **Y.** If and when **X** is equal to **Y**, the program prints “Reached!”   |  |  | | --- | --- | | ***Sample input(X,Y)*** | ***Sample output*** | | 10 5 | 100, 81, 64, 49, 36, Reached! | | 5 10 | 25, 36, 49, 64, 81, Reached! | | 10 10 | Reached! |   #include <stdio.h>  int main(){  int x,y;  printf("enter two number\n");  scanf("%d %d",&x,&y);  if(x<y){  for(x=x;x<y;x++){  printf("%d,",x\*x);  }  printf("reached!");  }  else if(x>y){  for(x=x;x>y;x--){  printf("%d,",x\*x);  }  printf("reached!");  }  else{  printf("Reached!");  }  return 0;  } | **\*** |
|  | Write a program (WAP) for the described scenario:  Player-1 picks a number **X** and Player-2 has to guess that number within **N** tries. For each wrong guess by Player-2, the program prints “Wrong, **N-1** Choice(s) Left!” If Player-2 at any time successfully guesses the number, the program prints “Right, Player-2 wins!” and terminates right away. Otherwise after the completion of **N** wrong tries, the program prints “Player-1 wins!” and halts.  (**Hint:** Use break/continue)   |  |  | | --- | --- | | ***Sample input***  ***(X,N,n1, n2,..,nN)*** | ***Sample output*** | | 5  3  12 8 5 | Wrong, 2 Choice(s) Left!  Wrong, 1 Choice(s) Left!  Right, Player-2 wins! | | 100  5  50 100 | Wrong, 4 Choice(s) Left!  Right, Player-2 wins! | | 20  3  12 8 5 | Wrong, 2 Choice(s) Left!  Wrong, 1 Choice(s) Left!  Wrong, 0 Choice(s) Left!  Player-1 wins! |   #include <stdio.h>  int main()  {  int tries,num,a,i;  srand (time(0));  printf("guess the number\n")  printf("how many chances do you want?\n");  scanf("%d",&tries);  num=rand()%10+1;  for(i=tries;i>=1;i--){  printf("guess the number: ");  scanf("%d",&a);  if(num==a){  printf("player 2 wins!");}  else {  if(a>num){  printf("Wrong %d chance left\n",i-1);    }  else {  printf("Wrong %d chance left\n",i-1);  }  }  }  printf("player 1 wins!");  return 0;  } | **\*\*** |
|  | Write a program (WAP) that will run and show keyboard inputs until the user types an ’A’at the keyboard.   |  |  | | --- | --- | | ***Sample input*** | ***Sample output*** | | X  1  a  A | Input 1: X  Input 2: 1  Input 3: a |   #include <stdio.h>  int main()  {  char ch;  int i;  for (i=1;;i++)  {  scanf("%c",&ch);  if(ch=='A')  {  printf(" ");  break ;  }  else  {  printf("\nInput:%c",ch);  }  }  return 0;  } | **\*** |
|  | Write a program (WAP) that will reverse the digits of an input integer.   |  |  | | --- | --- | | ***Sample input*** | ***Sample output*** | | 13579 | 97531 | | 4321 | 1234 |   #include<stdio.h >  int main() {  int n, rev;  printf("Please enter a number: ");  scanf("%d", & n);  for (rev = 0; n > 0; n=n/ 10) {  rev=rev \* 10;  rev=rev + n% 10;  }  printf("Reversed number is = %d", rev);  return 0;  } | **\*\*** |
|  | Write a program (WAP) that will find the grade of **N** students. For each student, it will take the marks of his/her the attendance (on 5 marks), assignment (on 10 marks), class test (on 15 marks), midterm (on 50 marks), term final (on 100 marks). Then based on the tables shown below, the program will output his grade.   |  |  | | --- | --- | | Attendance (A) | 5% | | Assignments (HW) | 10% | | Class Tests (CT) | 15% | | Midterm (MT) | 30% | | Final (TF) | 40% |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Marks | Letter Grade | Marks | Letter Grade | Marks | Letter Grade | | 90-100 | A | 70-73 | C+ | Less than 55 | F | | 86-89 | A- | 66-69 | C |  |  | | 82-85 | B+ | 62-65 | C- |  |  | | 78-81 | B | 58-61 | D+ |  |  | | 74-77 | B- | 55-57 | D |  |  |  |  |  | | --- | --- | | **Sample input (A,HW,CT,MT,TF)** | **Sample output** | | 2  5 10 15 44.5 92.5  0 7.5 5 20 55.5 | Student 1 : A  Student 2 : F | | **\*** |
|  | Write a program (WAP) that will give the sum of first Nth terms for the following series.  1, -2, 3, -4, 5, -6, 7, -8, 9, -10, 11, -12, 13, -14, …….   |  |  | | --- | --- | | ***Sample input*** | ***Sample output*** | | 2 | Result: -1 | | 3 | Result: 2 | | 4 | Result: -2 |   **#include<stdio.h >**  **int main() {**  **int n,i,sum=0;**  **printf("Enter Nth terms: ");**  **scanf("%d", &n);**  **for (i=1;i<=n;i++) {**  **if (i%2==0){**  **sum=sum-i;**  **}**  **else{**  **sum=sum+i;**  **}**  **}**  **printf("Result= %d",sum);**  **return 0;**  **}#include<stdio.h >**  **int main() {**  **int n,i,sum=0;**  **printf("Enter Nth terms: ");**  **scanf("%d", &n);**  **for (i=1;i<=n;i++) {**  **if (i%2==0){**  **sum=sum-i;**  **}**  **else{**  **sum=sum+i;**  **}**  **}**  **printf("Result= %d",sum);**  **return 0;**  **}** | **\*\*** |
|  | Write a program (WAP) that will calculate the result for the first Nth terms of the following series. [In that series sum, dot sign (.) means multiplication]  12.2 + 22.3 + 32.4 + 42.5 + …….   |  |  | | --- | --- | | ***Sample input*** | ***Sample output*** | | 2 | Result: 14 | | 3 | Result: 50 | | 4 | Result: 130 | | 7 | Result: 924 |   **#include<stdio.h >**  **int main() {**  **int n,i,sum=0;**  **printf("Enter Nth terms: ");**  **scanf("%d", &n);**  **for (i=1;i<=n;i++) {**  **sum=sum+i\*i\*(i+1);**  **}**  **printf("Result= %d",sum);**  **return 0;**  **}** | **\*\*** |
|  | Write a program (WAP) that will print Fibonacci series upto Nth terms.  1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, …….   |  |  | | --- | --- | | ***Sample input*** | ***Sample output*** | | 1 | 1 | | 2 | 1, 1 | | 4 | 1, 1, 2, 3 | | 7 | 1, 1, 2, 3, 5, 8, 13 |   **#include<stdio.h >**  **int main() {**  **int n,i,t1=1,t2=1,t3;**  **printf("Fibonacci series upto Nth terms:\n");**  **scanf("%d",&n);**  **printf("%d,%d,",t1,t2);**  **for (i=2;i<n;i++) {**  **t3=t1+t2;**  **printf("%d,",t3);**  **t1=t2;**  **t2=t3;**  **}**  **return 0;**  **}** | **\*\*** |
|  | Write a program (WAP) that will print the factorial (**N!)** of a given number **N**. Please see the sample input output.   |  |  | | --- | --- | | **Sample input** | **Sample output** | | 1 | 1! = 1 = 1 | | 2 | 2! = 2 X 1 = 2 | | 3 | 3! = 3 X 2 X 1 = 6 | | 4 | 4! = 4 X 3 X 2 X 1 = 24 |   #include <stdio.h>  int main()  {  int n,i,fact=1;  printf ("get the number for the factorial: ");  scanf("%d",&n);  for (i=1;i<=n;i++){  fact= fact \* i;  }  printf("%d!=%d",n,fact);  return 0;  } | \*\* |
|  | Write a program (WAP) that will find **nCr** where **n >= r**; **n** and **r** are integers.   |  |  | | --- | --- | | ***Sample input*** | ***Sample output*** | | 5 2 | 10 | | 10 3 | 120 | | 7 7 | 1 | | 6 1 | 6 |   **#include <stdio.h>**  **int factorial (int n){**  **int i,fact=1;**  **for(i=1;i<=n;i++){**  **fact=fact\*i;**  **}**  **return(fact);**  **}**  **int main()**  **{**  **int n,r,nCr;**  **printf("Enter two numbers: ");**  **scanf("%d %d",&n,&r);**  **nCr=factorial(n) / (factorial(r)\* factorial(n-r));**  **printf("nCr=%d",nCr);**  **return 0;**  **}** | **\*\*** |
|  | Write a program (WAP) that will find xy (x to the power y) where x, y are positive integers.   |  |  | | --- | --- | | ***Sample input(x,y)*** | ***Sample output*** | | 5 2 | 25 | | 2 0 | 1 | | 6 1 | 6 | | 0 5 | 0 |   **#include<stdio.h>**  **#include<math.h>**  **int main()**  **{**  **int x,y,res;**  **printf("Enter two number:\n");**  **scanf("%d %d", &x,&y);**  **if(x>=0 && y>=0){**  **res=pow(x,y);**  **printf("%d",res);**  **}**  **else{**  **printf("");**  **}**  **return 0;**  **}** | **\*** |
|  | WAP that will find the GCD (greatest common divisor) and LCM (least common multiple) of two positive integers.   |  |  | | --- | --- | | ***Sample input*** | ***Sample output*** | | 5 7 | GCD: 1  LCM: 35 | | 12 12 | GCD: 12  LCM: 12 | | 12 32 | GCD: 4  LCM: 96 |   #include <stdio.h>  int main()  {  int n1,n2,rem,GCD,LCM,num1,num2;  printf("Enter two numbers: ");  scanf("%d %d",&num1,&num2);  n1=num1;  n2=num2;  while(n2!=0){  rem=n1%n2;  n1=n2;  n2=rem;  GCD=n1;  }  printf("GCD:%d\n",GCD);  LCM=(num1\*num2)/GCD;  printf("LCM:%d\n",LCM);  return 0;  } | **\*\*** |
|  | WAP that will determine whether a number is prime or not.   |  |  | | --- | --- | | ***Sample input*** | ***Sample output*** | | 1 | Not prime | | 2 | Prime | | 11 | Prime | | 39 | Not prime | | 101 | Prime |   #include <stdio.h>  int main()  {  int n, i, flag = 0;  printf("Enter a positive integer: ");  scanf("%d", &n);  if (n==0 || n==1)  flag = 1;  for (i=2;i<= n/2;i++)  {  if (n%i==0) {  flag = 1;  break;  }  }  if (flag==0)  printf("prime");  else  printf("Not prime");  return 0;  } | **\*\*** |
|  | WAP that will determine whether an integer is palindrome number or not.   |  |  | | --- | --- | | ***Sample input*** | ***Sample output*** | | 9 | Yes | | 91 | No | | 222 | Yes | | 12321 | Yes | | 110 | No |   **#include<stdio.h>**  **int main()**  **{**  **int n, i, rev;**  **printf("Enter any number: ");**  **scanf("%d", &n);**  **rev = n;**  **for(i=0; n>0; n=n/10)**  **{**  **i = i \* 10;**  **i = i + (n%10);**  **}**  **if(rev==i){**  **printf("Yes");**  **}**  **else{**  **printf("No");**  **}**  **return 0;**  **}** | **\*\*** |
|  | WAP that will calculate following mathematical function for the input of x. Use only the series to solve the problem.     |  |  | | --- | --- | | ***Sample input*** | ***Sample output*** | | 1 | 0.841 | | 2 | 0.909 | | 3 | 0.141 |   **#include <stdio.h>**  **#include<math.h>**  **unsigned long factorial(unsigned long f);**  **int main()**  **{**  **int i;**  **float x,sum=0, presum = 0;**  **printf("Input the value: ");**  **scanf("%f",&x);**  **i=0;**  **while(1)**  **{**  **sum = sum +(pow(-1,i)\*pow(x,(2\*i+1)))/factorial(2\*i+1);**  **float a =(sum -presum);**  **printf("%f\n",a);**  **if((a <0.0001)&&(a>0)){**  **break;**  **}**  **presum = sum;**  **i=i+1;**  **}**  **printf("\n\n%f\n",sum);**  **return 0;**  **}**  **unsigned long factorial(unsigned long f)**  **{**  **if ( f == 0 )**  **return 1;**  **return(f \* factorial(f - 1));**  **}** | **\*\*\*** |
|  | Write a program that takes an integer number n as input and find out the sum of the following series up to n terms.  1 + 12 + 123 + 1234 + …….   |  |  | | --- | --- | | ***Sample input*** | ***Sample output*** | | 1 | 1 | | 2 | 13 | | 3 | 136 | | 4 | 1370 |   **#include <stdio.h>**  **int main(){**  **int i,n,sum=0,term=0;**  **printf("Enter Nth termse: ");**  **scanf("%d",&n);**  **for(i=1;i<=n;i++){**  **term=(term\*10)+i;**  **sum=sum+term;**  **}**  **printf("sum:%d",sum);**  **}** | **\*\*** |