**Condition Related Problems**

**(Total 15 questions)**

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| **SL** | **Problem statement** | **Difficulty levels** |
|  | Program that will decide whether a number is positive or not.   |  |  | | --- | --- | | **Sample input** | **Sample output** | | 100 | Positive | | -11.11 | Negative | | 0 | Positive |   #include <stdio.h>  int main(){  int a;  printf("Enter the number ");  scanf("%d",&a);  if(a>=0) {  printf("positive");  }  else {  printf("Negative");  }  return 0;  } | \* |
|  | Program that will decide whether a number is even or odd.   |  |  | | --- | --- | | **Sample input** | **Sample output** | | 50 | Even | | -77 | Odd | | 0 | Even |   #include <stdio.h>  int main(){  int a;  printf("Enter the number ");  scanf("%d",&a);  if(a%2==0) {  printf("Even");  }  else {  printf("Odd");  }  return 0;  } | \* |
|  | Program that will take an integer of length one from the terminal and then display the digit in English.   |  |  | | --- | --- | | **Sample input** | **Sample output** | | 9 | nine | | 0 | zero |   #include <stdio.h>  int main(){  int a;  printf("Enter the number ");  scanf("%d",&a);  if(a==1) {  printf("One");  }  else if(a==2){  printf("Two");  }  else if(a==3){  printf("Three");  }  else if(a==4){  printf("Four");  }  else if(a==5){  printf("Five");  }  else if(a==6){  printf("Six");  }  else if(a==7){  printf("Seven");  }  else if(a==8){  printf("Eight");  }  else if(a==9){  printf("Nine");  }  else {  printf("Zero");  }  return 0;  } | \* |
|  | Program that will check whether a triangle is valid or not, when the three angles (angle value should be such that, 0 < value < 180) of the triangle are entered through the keyboard.  [**Hint:** A triangle is valid if the sum of all the three angles is equal to 180 degrees.]   |  |  | | --- | --- | | **Sample input** | **Sample output** | | 90 45 45 | Yes | | 30 110 40 | Yes | | 160 20 30 | No | | 0 180 0 | No |   #include <stdio.h>  int main(){  int a,b,c;  printf("Enter three angles ");  scanf("%d %d %d",&a,&b,&c);  if(a+b+c<180) {  printf("Yes");  }  else {  printf("no");  }  return 0;  } | \* |
|  | Program that will read from the console a random positive nonzero number and determine if it is a power of 2.   |  |  | | --- | --- | | **Sample input** | **Sample output** | | 1 | Yes | | 512 | Yes | | 1022 | No |   #include <stdio.h>  int main(){  int a;  float x;  printf("Enter the number ");  scanf("%d",&a);  x=log (a)/log (2);  if(ceil(x)==floor(x)) {  printf("Yes");  }  else {  printf("no");  }  return 0;  } | \*\* |
|  | Program that will read from the console a random number and check if it is a nonzero positive number. If the check is yes, it will determine if the number is a power of 2.  If the check fails the program will check for two more cases. If the number is zero, the program will print “Zero is not a valid input”. Else it will print “Negative input is not valid”.   |  |  | | --- | --- | | **Sample input** | **Sample output** | | 0 | Zero is not a valid input | | 1 | Yes | | 512 | Yes | | 1022 | No | | -512 | Negative input is not valid |   #include <stdio.h>  int main(){  int a;  float x;  printf("Enter the number ");  scanf("%d",&a);  x=log (a)/log (2);  if(a==0){  printf ("Zero is not a valid input");  }  else if(a<0){  printf ("Negative input is not valid");  }  else if(ceil(x)==floor(x)){  printf("Yes");  }  else {  printf("no");  }  return 0;  } | \*\*\* |
|  | Program that will take two numbers **X** & **Y** as inputs and decide whether **X** is greater than/less than/equal to **Y.**   |  |  | | --- | --- | | **Sample input (X,Y)** | **Sample output** | | 5 -10 | 5 is greater than -10 | | 5 10 | 5 is less than 10 | | 5 5 | 5 is equal to 5 | | #include <stdio.h>  int main(){  int x,y;  printf("Enter two number ");  scanf("%d %d",&x,&y);  if(x>y){  printf ("%d is greater than %d",x,y);  }  else if (x<y){  printf("%d is less than %d",x,y);  }  else if (x==y){  printf ("%d is equal to %d",x,y);  }  return 0;  } |  | | \* |
|  | Program that will decide whether a year is leap year or not.  Yes, if ( Year % 4 == 0 && year % 100 != 0 ) || ( Year % 400 ==0 )   |  |  | | --- | --- | | **Sample input** | **Sample output** | | 2000 | Yes | | 2004 | Yes | | 2014 | No |   #include <stdio.h>  int main(){  int x;  printf("Enter a year ");  scanf("%d",&x);  if((x%4==0 && x%100!=0) || (x%400==0)){  printf ("Yes");  }  else {  printf("No");  }  return 0;  } | \* |
|  | Program that will categorize a single character that is entered at the terminal, whether it is an alphabet, a digit or a special character.  (**Restriction:** Without math.h)   |  |  | | --- | --- | | **Sample input** | **Sample output** | | z | Alphabet | | A | Alphabet | | 8 | Digit | | \* | Special |   #include <stdio.h>  int main(){  char ch;  printf("Enter any charecter ");  scanf("%c",&ch);  if(ch>='0'&&ch<='9'){  printf ("Digit");  }  else if ((ch>='a'&&ch<='z')||(ch>='A'&&ch<='Z')){  printf("Alphabet");  }  else {  printf("Special");  }  return 0;  } | \* |
|  | Program that will evaluate simple expressions of the form-  <number1> <operator> <number2>  ; where operators are (+, - , \*, /)  And if the operator is “/”, then check if <number2> nonzero or not.   |  |  | | --- | --- | | **Sample input** | **Sample output** | | 100 \* 55.5 | Multiplication: 5550 | | 100 / -5.5 | Division: -18.181818 | | 100 / 0 | Division: Zero as divisor is not valid! |   #include <stdio.h>  #include <math.h>  int main(){  double num1,num2,result;  char op;  scanf("%lf %c %lf",&num1,&op,&num2);  if(op=='+'){  result=num1+num2;  printf("Addition= %lf",result);  }  else if(op=='-'){  result=num1-num2;  printf("Divition= %lf",result);  }  else if(op=='\*'){  result=num1\*num2;  printf("Multiplication= %lf",result);  }  else if(op=='/'){  if(num2==0){  printf("Zero as divisor is not valid!");  }  else {  result=num1/num2;  printf("Divition= %lf",result);  }  }  return 0;  } | \*\* |
|  | Program that will take the final score of a student in a particular subject as input and find his/her grade.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 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** | **Sample output** | | 91.5 | Grade: A | | 50 | Grade: F |   #include <stdio.h>  int main(){  float mark;  printf("Enter the marks ");  scanf("%f",&mark);  if(90<=mark && mark<=100) {  printf("Grade:A");  }  else if(86<=mark && mark<=89){  printf("Grade:A-");  }  else if(82<=mark && mark<=85){  printf("Grade:B");  }  else if(78<=mark && mark<=81){  printf("Grade:B+");  }  else if(74<=mark && mark<=77){  printf("Grade:B-");  }  else if(70<=mark && mark<=73){  printf("Grade:C+");  }  else if(66<=mark && mark<=69){  printf("Grade:C");  }  else if(62<=mark && mark<=65){  printf("Grade:C-");  }  else if(58<=mark && mark<=61){  printf("Grade:D+");  }  else if(55<=mark && mark<=57){  printf("Grade:D");  }  else if(55>=mark){  printf("Geade:F");  }  else{  printf("Grade:F");  }  return 0;  } | \* |
|  | Program that will construct a menu for performing arithmetic operations. The user will give two real numbers **(a, b)** on which the arithmetic operations will be performed and an integer number (1 <= Choice<= 4)as a choice. Choice-1, 2, 3, 4 are for performing addition, subtraction, multiplication, division (quotient) respectively.   |  |  | | --- | --- | | **Sample input (a, b, Choice)** | **Sample output** | | 5 10  3 | Multiplication: 50 | | -5 10.5  4 | Quotient: 0 |   #include <stdio.h>  int main(){  float a,b;  int choice;  printf("Enter two number ");  scanf("%f %f",&a,&b);  printf("Do choice from 1 to 4: ");  scanf("%d",&choice);  if(choice==1){  printf("Addition= %f",a+b);  }  else if(choice==2){  printf("Subtraction: &f",a-b);  }  else if(choice==3){  printf("Multiplication: &f",a\*b);  }  else if(choice==4){  printf("Divitiom: &f",a/b);  }  else{  printf("invalid");  }  return 0;  } | \* |
|  | Program that will construct a menu for performing arithmetic operations. The user will give two real numbers **(a, b)** on which the arithmetic operations will be performed and an integer number (1 <= **Choice** <= 4)as a choice. Choice-1, 2, 3, 4 are for performing addition, subtraction, multiplication, division respectively.  If Choice-4 is selected, again the program will ask for another choice (1 <= **Case** <=2), where Case-1, 2 evaluate quotient and reminder respectively.   |  |  | | --- | --- | | **Sample input** | **Sample output** | | 5 10  3 | Multiplication: 50 | | -5 10.5  4  1 | Quotient: 0 | | -5 10.5  4  2 | Reminder: -48 |   #include <stdio.h>  int main(){  float a,b;  int choice;  printf("Enter two number ");  scanf("%f %f",&a,&b);  printf("Do choice from 1 to 4: ");  scanf("%d",&choice);  if(choice==1){  printf("Addition= %f ",a+b);  }  else if(choice==2){  printf("Subtraction: %f",a-b);  }  else if(choice==3){  printf("Multiplication: %f",a\*b);  }  else if(choice==4){  printf("Do choice 1 or 2: ");  scanf("%d",&choice);  if(choice==1){  printf("Divition: %f",a/b);  }  else if(choice==2){  int a,b;  int res=(int)a%(int)b;  printf("Reminder: %d ",res);  }  }  else{  printf("invalid");  }  return 0;  } | \*\* |
|  | Program that will construct a menu for performing arithmetic operations. The user will give two real numbers **(a, b)** on which the arithmetic operations will be performed and an integer number (1 <= **Choice** <= 4)as a choice. Choice-1, 2, 3, 4 are for performing addition, subtraction, multiplication, division respectively.  If Choice-4 is selected, the program will check if **b** is nonzero.  If the check is true, the program will ask for another choice (1 <= **Case** <=2), where Case-1, 2 evaluate quotient and reminder respectively. If the check is false, it will print an error message “Error: Divisor is zero” and halt.   |  |  | | --- | --- | | **Sample input** | **Sample output** | | 5 10  3 | Multiplication: 50 | | -5 10.5  4  2 | Reminder: -48 | | -5 0  4 | Error: Divisor is zero |   #include <stdio.h>  int main()  {  float a,b;  int choice;  printf("Enter two number ");  scanf("%f %f",&a,&b);  printf("Do choice from 1 to 4: ");  scanf("%d",&choice);  if(choice==1)  {  printf("Addition= %f ",a+b);  }  else if(choice==2)  {  printf("Subtraction: %f",a-b);  }  else if(choice==3)  {  printf("Multiplication: %f",a\*b);  }  else if(choice==4)  {  if(b!=0)  {  printf("Choose between 1 or 2: ");  scanf("%d",&choice);  if(choice==1)  {  printf("Division: %f",a/b);  }  else if(choice==2)  {  int res=(int)a%(int)b;  printf("Reminder: %d ",res);  }  }  else if (b==0)  {  printf("Divisor is zero");  }  }  return 0;  } | \*\*\* |
|  | Program for “Guessing Game”:  Player-1 picks a number **X** and Player-2 has to guess that number within **N = 3** tries. For each wrong guess by Player-2, the program prints “Wrong, **N-1** Chance(s) Left!” If Player-2 successfully guesses the number, the program prints “Right, Player-2 wins!” and stops allowing further tries (if any left). Otherwise after the completion of **N = 3** wrong tries, the program prints “Player-1 wins!” and halts.  [ **Restriction:** Without using loop/break/continue  **Hint:** Use flag ]     |  |  | | --- | --- | | ***Sample input***  ***(X, n1, n2, n3)*** | ***Sample output*** | | 5  12 8 5 | Wrong, 2 Chance(s) Left!  Wrong, 1 Chance(s) Left!  Right, Player-2 wins! | | 100  50 100 | Wrong, 2 Chance(s) Left!  Right, Player-2 wins! | | 20  12 8 5 | Wrong, 2 Chance(s) Left!  Wrong, 1 Chance(s) Left!  Wrong, 0 Chance(s) Left!  Player-1 wins! |   #include <stdio.h>  int main()  {  int X,n1,n2,n3;  scanf("%d",&X);  printf("Guess the value:\n");  scanf("%d %d %d",&n1,&n2,&n3);  if(X==n1)  {  printf("Right, player 2 wins!\n");  }  else  {  printf("Wrong! 2 chances left\n");  if(X==n2)  {  printf("Right, player 2 wins!\n");  }  else  {  printf("Wrong! 1 chances left\n");  if(X==n3)  {  printf("Right, player 2 wins!\n");  }  else  {  printf("Wrong! 0 chances left\n");  }  }  }  if(X!=n1 && X!=n2 && X!=n3)  {  printf("Player 1 wins!");  }  return 0;  } | \*\*\* |