Condition Related Problems

(Total 15 questions)

SL	Problem statement	Difficulty levels
1.	Program that will decide whether a number is positive or not. <table><tr><td>**Sample input**</td><td>**Sample output**</td></tr><tr><td>100</td><td>Positive</td></tr><tr><td>-11.11</td><td>Negative</td></tr><tr><td>0</td><td>Positive</td></tr></table>	*
2.	Program that will decide whether a number is even or odd. <table><tr><td>**Sample input**</td><td>**Sample output**</td></tr><tr><td>50</td><td>Even</td></tr><tr><td>-77</td><td>Odd</td></tr><tr><td>0</td><td>Even</td></tr></table>	*
3.	Program that will take an integer of length one from the terminal and then display the digit in English. <table><tr><td>**Sample input**</td><td>**Sample output**</td></tr><tr><td>9</td><td>nine</td></tr><tr><td>0</td><td>zero</td></tr></table>	*
4.	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.] <table><tr><td colspan="3">**Sample input**</td><td>**Sample output**</td></tr><tr><td>90</td><td>45</td><td>45</td><td>Yes</td></tr><tr><td>30</td><td>110</td><td>40</td><td>Yes</td></tr><tr><td>160</td><td>20</td><td>30</td><td>No</td></tr><tr><td>0</td><td>180</td><td>0</td><td>No</td></tr></table>	*
5.	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

6. 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".

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Sample input	Sample output
0	Zero is not a valid input
1	Yes
512	Yes
1022	No
-512	Negative input is not valid

7. Program that will take two numbers **X** & **Y** as inputs and decide whether **X** is greater than/less than/equal to **Y.**

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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

8. Program that will decide whether a year is leap year or not.

Yes, if (Year % 4 == 0 && year % 100 != 0) || (Year % 400 ==0)

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Sample input	Sample output
2000	Yes
2004	Yes
2014	No

9. 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)

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Sample input	Sample output
z	Alphabet
A	Alphabet
8	Digit
*	Special

10. 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!

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11. 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

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12. 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

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5 10 3	Multiplication: 50
-5 10.5 4	Quotient: 0

13.	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 remainder respectively.

Sample input	Sample output
5 10 3	Multiplication: 50
-5 10.5 4 1	Quotient: 0
-5 10.5 4 2	Remainder: -48

1. Addition
2. Subtraction
3. Multiplication
4. Division

   1. Quotient
   2. Remainder

14.	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

| **15.** | 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 <u>stops allowing further tries (if any left)</u>. 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!