

# 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><th>Sample input</th><th>Sample output</th></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>		Sample input	Sample output	100	Positive	-11.11	Negative	0	Positive		
	Sample input		Sample output									
	100		Positive									
	-11.11		Negative									
0	Positive											
2.	Program that will decide whether a number is even or odd.	*										
	<table><tr><th>Sample input</th><th>Sample output</th></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>		Sample input	Sample output	50	Even	-77	Odd	0	Even		
	Sample input		Sample output									
	50		Even									
	-77		Odd									
0	Even											
3.	Program that will take an integer of length one from the terminal and then display the digit in English.	*										
	<table><tr><th>Sample input</th><th>Sample output</th></tr><tr><td>9</td><td>nine</td></tr><tr><td>0</td><td>zero</td></tr></table>		Sample input	Sample output	9	nine	0	zero				
	Sample input		Sample output									
	9		nine									
	0		zero									
4.	Program that will check whether a triangle is valid or not, when the three angles (angle value should be such that, $0 < \text{value} < 180$ ) 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><th>Sample input</th><th>Sample output</th></tr><tr><td>90    45    45</td><td>Yes</td></tr><tr><td>30    110    40</td><td>Yes</td></tr><tr><td>160    20    30</td><td>No</td></tr><tr><td>0    180    0</td><td>No</td></tr></table>		Sample input	Sample output	90    45    45	Yes	30    110    40	Yes	160    20    30	No	0    180    0	No
	Sample input		Sample output									
	90    45    45		Yes									
	30    110    40		Yes									
	160    20    30		No									
	0    180    0		No									

5.	<p>Program that will read from the console a random positive nonzero number and determine if it is a power of 2.</p> <table><tr><th>Sample input</th><th>Sample output</th></tr><tr><td>1</td><td>Yes</td></tr><tr><td>512</td><td>Yes</td></tr><tr><td>1022</td><td>No</td></tr></table>	Sample input	Sample output	1	Yes	512	Yes	1022	No	**				
Sample input	Sample output													
1	Yes													
512	Yes													
1022	No													
6.	<p>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.</p> <p>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”.</p> <table><tr><th>Sample input</th><th>Sample output</th></tr><tr><td>0</td><td>Zero is not a valid input</td></tr><tr><td>1</td><td>Yes</td></tr><tr><td>512</td><td>Yes</td></tr><tr><td>1022</td><td>No</td></tr><tr><td>-512</td><td>Negative input is not valid</td></tr></table>	Sample input	Sample output	0	Zero is not a valid input	1	Yes	512	Yes	1022	No	-512	Negative input is not valid	***
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0	Zero is not a valid input													
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512	Yes													
1022	No													
-512	Negative input is not valid													
7.	<p>Program that will take two numbers <b>X</b> &amp; <b>Y</b> as inputs and decide whether <b>X</b> is greater than/less than/equal to <b>Y</b>.</p> <table><tr><th>Sample input (X,Y)</th><th>Sample output</th></tr><tr><td>5 -10</td><td>5 is greater than -10</td></tr><tr><td>5 10</td><td>5 is less than 10</td></tr><tr><td>5 5</td><td>5 is equal to 5</td></tr></table>	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	*				
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.	<p>Program that will decide whether a year is leap year or not.</p> <p>Yes, if ( Year % 4 == 0 &amp;&amp; year % 100 != 0 )    ( Year % 400 ==0 )</p> <table><tr><th>Sample input</th><th>Sample output</th></tr><tr><td>2000</td><td>Yes</td></tr><tr><td>2004</td><td>Yes</td></tr><tr><td>2014</td><td>No</td></tr></table>	Sample input	Sample output	2000	Yes	2004	Yes	2014	No	*				
Sample input	Sample output													
2000	Yes													
2004	Yes													
2014	No													

9.	<p>Program that will categorize a single character that is entered at the terminal, whether it is an alphabet, a digit or a special character.</p> <p>(Restriction: Without math.h)</p> <table><tr><th>Sample input</th><th>Sample output</th></tr><tr><td>z</td><td>Alphabet</td></tr><tr><td>A</td><td>Alphabet</td></tr><tr><td>8</td><td>Digit</td></tr><tr><td>*</td><td>Special</td></tr></table>	Sample input	Sample output	z	Alphabet	A	Alphabet	8	Digit	*	Special	*																																
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z	Alphabet																																											
A	Alphabet																																											
8	Digit																																											
*	Special																																											
10.	<p>Program that will evaluate simple expressions of the form-</p> <p style="text-align: center;">&lt;number1&gt; &lt;operator&gt; &lt;number2&gt;</p> <p style="text-align: center;">; where operators are (+, - , *, /)</p> <p style="text-align: center;">And if the operator is “/”, then check if &lt;number2&gt; nonzero or not.</p> <table><tr><th>Sample input</th><th>Sample output</th></tr><tr><td>100 * 55.5</td><td>Multiplication: 5550</td></tr><tr><td>100 / -5.5</td><td>Division: -18.181818</td></tr><tr><td>100 / 0</td><td>Division: Zero as divisor is not valid!</td></tr></table>	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.	<p>Program that will take the final score of a student in a particular subject as input and find his/her grade.</p> <table><tr><td>Marks</td><td>Letter Grade</td><td>Marks</td><td>Letter Grade</td><td>Marks</td><td>Letter Grade</td></tr><tr><td>90-100</td><td>A</td><td>70-73</td><td>C+</td><td>Less than 55</td><td>F</td></tr><tr><td>86-89</td><td>A-</td><td>66-69</td><td>C</td><td></td><td></td></tr><tr><td>82-85</td><td>B+</td><td>62-65</td><td>C-</td><td></td><td></td></tr><tr><td>78-81</td><td>B</td><td>58-61</td><td>D+</td><td></td><td></td></tr><tr><td>74-77</td><td>B-</td><td>55-57</td><td>D</td><td></td><td></td></tr></table> <table><tr><th>Sample input</th><th>Sample output</th></tr><tr><td>91.5</td><td>Grade: A</td></tr><tr><td>50</td><td>Grade: F</td></tr></table>	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.	<p>Program that will construct a menu for performing arithmetic operations. The user will give two real numbers <b>(a, b)</b> on which the arithmetic operations will be performed and an integer number (<math>1 \leq \text{Choice} \leq 4</math>) as a choice. Choice-1, 2, 3, 4 are for performing addition, subtraction, multiplication, division (quotient) respectively.</p> <table><tr><th>Sample input (a, b, Choice)</th><th>Sample output</th></tr><tr><td>5 10 3</td><td>Multiplication: 50</td></tr><tr><td>-5 10.5 4</td><td>Quotient: 0</td></tr></table>	Sample input (a, b, Choice)	Sample output	5 10 3	Multiplication: 50	-5 10.5 4	Quotient: 0	*		
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Sample input	Sample output									
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14.	<p>Program that will construct a menu for performing arithmetic operations. The user will give two real numbers (<b>a, b</b>) on which the arithmetic operations will be performed and an integer number (<math>1 \leq \text{Choice} \leq 4</math>) as a choice. Choice-1, 2, 3, 4 are for performing addition, subtraction, multiplication, division respectively.</p> <p>If Choice-4 is selected, the program will check if <b>b</b> is nonzero.</p> <p>If the check is true, the program will ask for another choice (<math>1 \leq \text{Case} \leq 2</math>), where Case-1, 2 evaluate quotient and remainder respectively. If the check is false, it will print an error message "Error: Divisor is zero" and halt.</p> <table><tr><th>Sample input</th><th>Sample output</th></tr><tr><td>5 10 3</td><td>Multiplication: 50</td></tr><tr><td>-5 10.5 4 2</td><td>Reminder: -48</td></tr><tr><td>-5 0 4</td><td>Error: Divisor is zero</td></tr></table>	Sample input	Sample output	5 10 3	Multiplication: 50	-5 10.5 4 2	Reminder: -48	-5 0 4	Error: Divisor is zero	***
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-5 10.5 4 2	Reminder: -48									
-5 0 4	Error: Divisor is zero									
15.	<p>Program for "Guessing Game": Player-1 picks a number <b>X</b> and Player-2 has to guess that number within <b>N = 3</b> tries. For each wrong guess by Player-2, the program prints "Wrong, <b>N-1</b> 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 <b>N = 3</b> wrong tries, the program prints "Player-1 wins!" and halts.</p> <p>[ <b>Restriction:</b> Without using loop/break/continue <b>Hint:</b> Use flag ]</p> <table><tr><th>Sample input (X, n1, n2, n3)</th><th>Sample output</th></tr><tr><td>5 12 8 5</td><td>Wrong, 2 Chance(s) Left! Wrong, 1 Chance(s) Left! Right, Player-2 wins!</td></tr><tr><td>100 50 100</td><td>Wrong, 2 Chance(s) Left! Right, Player-2 wins!</td></tr><tr><td>20</td><td>Wrong, 2 Chance(s) Left!</td></tr></table>	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	Wrong, 2 Chance(s) Left!	***
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	Wrong, 2 Chance(s) Left!									

	12 8 5	Wrong, 1 Chance(s) Left! Wrong, 0 Chance(s) Left! Player-1 wins!		