**Operator Related Problems**

**(Total 15 questions)**

| **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 | | \* |
|  | Program that will decide whether a number is even or odd.   | **Sample input** | **Sample output** | | --- | --- | | 50 | Even | | -77 | Odd | | 0 | Even | | \* |
|  | 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 | | \* |
|  | 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 | | \* |
|  | 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 | | \*\* |
|  | 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 | | \*\*\* |
|  | 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 | | \* |
|  | 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 | | \* |
|  | 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 | | \* |
|  | 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! | | \*\* |
|  | 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 | | \* |
|  | 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 | | \* |
|  | 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 | | \*\* |
|  | 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 | | \*\*\* |
|  | 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! | | \*\*\* |