1. Write a function getCube() to find cube of any float number and call the function from main() to display the value.

2. Write a function to minOfThree() to find the minimum of three integers and return to the main() where it is printed.

3. Write a C program to input amount from user and print minimum number of notes (Rs. 2000, 500, 200,100, 50, 20, 10, 5, 2, 1) required for the amount.
   Input: 2511
   Output: 4
   Input: 12344
   Output: 12

4. During the winter, the United States meteorological office often includes with its weather forecasts an index known as wind chill factor. This reflects how cold the air feels when the wind is blowing, based on the actual coolness of the air and the wind speed. As you probably are aware, the stronger the wind cooler it feels. The wind chill temperature may be calculated by means of the following formula:

   \[ W = 33 - \frac{(10\sqrt{v} - v + 10.5)(33 - t)}{23.1} \]

   Where,
   \( v \) = wind velocity in meters per second
   \( t \) = outside temperature in degree celsius
   \( W \) = wind chill temperature in degree celsius

   Write a function that returns the wind chill temperature given the temperature and the wind velocity. The function accepts the temperature in Farhenheit, converts to Celsius. The temperature should not be more than 10 degrees Celsius.

5. Morse code is a character encoding scheme used in telecommunication that encodes text characters as sequences of two different signal durations represented by dots and dashes. Each Morse code symbol is formed by a sequence of dots and dashes. The figure below shows the Morse codes for
different characters. Write a morse code for sequence of length three of capital letters: from A, B.. J entered by the user. Do not consider the letters beyond L (M-Z).

<table>
<thead>
<tr>
<th>Character</th>
<th>Morse Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>.</td>
</tr>
<tr>
<td>B</td>
<td>-</td>
</tr>
<tr>
<td>C</td>
<td>- -</td>
</tr>
<tr>
<td>D</td>
<td>- - -</td>
</tr>
<tr>
<td>E</td>
<td>.</td>
</tr>
<tr>
<td>F</td>
<td>- -</td>
</tr>
<tr>
<td>G</td>
<td>- -</td>
</tr>
<tr>
<td>H</td>
<td>...</td>
</tr>
<tr>
<td>I</td>
<td>..</td>
</tr>
<tr>
<td>J</td>
<td>---</td>
</tr>
<tr>
<td>K</td>
<td>- - -</td>
</tr>
<tr>
<td>L</td>
<td>- - -</td>
</tr>
<tr>
<td>M</td>
<td>-</td>
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<tr>
<td>N</td>
<td>-</td>
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<tr>
<td>O</td>
<td>---</td>
</tr>
<tr>
<td>P</td>
<td>- -</td>
</tr>
<tr>
<td>Q</td>
<td>---</td>
</tr>
<tr>
<td>R</td>
<td>- -</td>
</tr>
<tr>
<td>S</td>
<td>...</td>
</tr>
<tr>
<td>T</td>
<td>-</td>
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<tr>
<td>U</td>
<td>- -</td>
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<tr>
<td>V</td>
<td>...</td>
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<tr>
<td>W</td>
<td>- -</td>
</tr>
<tr>
<td>X</td>
<td>- - -</td>
</tr>
<tr>
<td>Y</td>
<td>---</td>
</tr>
<tr>
<td>Z</td>
<td>--</td>
</tr>
</tbody>
</table>

Example: HEA: ........-

6. Write a program which accepts a number n and then finds the sum of the integers from 1 to 2, then from 1 to 3, then 1 to 4 and so forth until it displays the sum of the integers from 1 to n. For example, if the input is 5, the output will be: 1 3 6 10 15.

7. Write a function printStrong() to print all Strong numbers between 1 to n. *Strong number* is a special number whose sum of factorial of digits is equal to the original number. For example: 145 is strong number. Since, \(1! + 4! + 5! = 145\).

8. Write a function getFactorial() to find factorial of any integer number using recursion.

9. Write a function getSumofDigits() to calculate sum of digits of a positive number n using recursion.

Write a function getGCD() to compute the greatest common divisor given by Euclid’s algorithm (Refer to the Lecture folder) using recursion, exemplified for J=1980 and K = 1617 as follows:

\[
\begin{align*}
1980/1617 &= 1 \quad 1980 - 1\times1617 = 363 \\
1617/363 &= 4 \quad 1617 - 4\times363 = 165 \\
363/165 &= 2 \quad 363 - 2\times165 = 33 \\
5/33 &= 5 \quad 165 - 5\times33 = 0
\end{align*}
\]

Thus the greatest common divisor is 33.

10. Write a function getReverse() to find reverse of any number using recursion.
Batch 2

1. Write a function min() to find the minimum of two float numbers and call it from main() and print the value.

2. Write a function printSigmoid() to print the values of the sigmoid function for x ranging from –n to n where n is the number input by the user. Sigmoid function is defined as \( f(x) = \frac{1}{1+e^{-x}} \). Print the value of this function for x ranging from –n to n having a step size of 2. Take n as input.

3. Write a function getYearWeekDay() to input number of days from user and convert it to years, weeks and days. Consider 365 days in a year.

4. Write a function printAngle() that prints the third angle of the triangle based on the two angles entered by the user. Also, print “error” if the entered angles cannot form a triangle.

5. Write a function calculate() which is called from main(), to create a menu driven calculator that performs basic arithmetic operations (add, subtract, multiply and divide, modular division) using switch-case-default. The function should input two numbers and an operator from user.
   Example:
   Input : 1+2
   Output:3
   Test cases: 4 / 2, 1 + 9, 10 - 9, 4 *0, 1 / 0, 3%2

6. Write a program which accepts a number n and then finds the sum of the integers from 1 to 2, then from 1 to 3, then 1 to 4 and so forth until it displays the sum of the integers from 1 to n. For example, if the input is 5, the output will be: 1 3 6 10 15.

7. Amicable numbers are two different numbers so related that the sum of the proper divisors of each is equal to the other number. (A proper divisor of a number is a positive factor of that number other than the number itself. The proper divisors of 6 are 1, 2, and 3). The numbers 220 and 284 are amicable numbers. Since the sum of proper divisors of 220 is equal to 284, and the sum of proper divisors of 284 is equal to 220. Write a function isAmicable() to check whether the entered numbers are amicable numbers or not.
8. Write a function getFactorial() to find factorial of any integer number using recursion.

9. A positive number is entered through the keyboard, write a function to calculate sum of digits of the number using recursion.

10. Write a function getGCD() to compute the greatest common divisor given by Euclid’s algorithm using recursion, exemplified for J=1980 and K = 1617 as follows:

\[
\begin{align*}
1980/1617 & = 1 & 1980 - 1 \times 1617 & = 363 \\
1617/363 & = 4 & 1617 - 4 \times 363 & = 165 \\
363/165 & = 2 & 363 - 2 \times 165 & = 33 \\
5/33 & = 5 & 165 - 5 \times 33 & = 0 \\
\end{align*}
\]

Thus the greatest common divisor is 33.

11. Write a function printBinary() to find the binary equivalent of a given decimal integer using recursion and print it.
Test cases:
   i) Input: 50
      Output: 110010
   ii) Input: 5
      Output: 101
   iii) Input: 100
       Output: 1100100
Batch 3

1. Write a function getCube() to find cube of any float number and call the function from main() to display the value.

2. ASCII code is a code for representing 128 English characters as numbers, with each letter assigned a number from 0 to 127. For example, the ASCII code for uppercase M is 77. Most computers use ASCII codes to represent text, which makes it possible to transfer data from one computer to another. Write a function printText() to take ascii values as input from the user and print the corresponding text.

3. Write a function printDay() for a given date.
   i) Input: 21 9 2019
       Output: saturday
   ii) input : 26 1 2001
       Output: Friday

4. Write a C program to input electricity unit charge and calculate the total electricity bill according to the given condition:
   For first 50 units Rs. 0.50/unit
   For next 100 units Rs. 0.75/unit
   For next 100 units Rs. 1.20/unit
   For unit above 250 Rs. 1.50/unit
   An additional surcharge of 20% is added to the bill.
   (The output to be specified to the precision of two digits after decimal point.)
   (i)Input:150
   Output:Electricity Bill = Rs. 120.00
   (ii)Input:60
   Output:Electricity Bill = Rs. 39.00
   (iii)Input:400
   Output:Electricity Bill = Rs. 534.00
   (iv)Input:413
   Output:Electricity Bill = Rs. 557.40
   (v)Input:256
   Output:Electricity Bill = Rs. 274.80
5. Write a C program to compute total bill at a supermarket using switch case. 
   Input item number and quantity from user and add it to the total amount. 
   Continue the process until user presses 4. Print total bill amount as output. 
   
   Item1 - bread - price : 15 Rs. 
   Item2 - butter - price : 40 Rs. 
   Item3 - Milk - price: 20 Rs. 
   i) Input: 1 2 1 3 1 4 
      Output: 90 
   ii) Input: 2 1 2 1 1 3 1 4 
        Output: 115 
   iii) Input: 3 4 4 
        Output: 80 

6. Write a C program to compute the factorial of a positive number using loop. 
   Print error message “Error! factorial of negative number not possible” in 
   case of negative number” 
   i) Input: 5 
      Output: 120 
   ii) Input: 0 
      Output: 1 
   iii) Input : -50 
        Output :Error! factorial of negative number not possible 
   iv) Input: 10 
      Output: 3628800 

7. Write a program that allows any positive integer to be typed in. Write a 
   function count2million() that counts how many times the number has to be 
   doubled before it is greater than or equal to 10 lakh (10,00,000). 

8. Write a function getFactorial() to find factorial of any integer number using 
   recursion. 

9. Write a recursive function which calculates multiplication of two numbers 
   you are not allowed to use multiplication (*) operator in that function. 
   i) input : 2 3 
      Output : 6 

10.Write a function getGCD() to compute the greatest common divisor given by 
    Euclid’s algorithm using recursion, exemplified for J=1980 and K = 1617 as 
    follows:
\[
\begin{align*}
1980/1617 &= 1 \quad 1980 - 1 \times 1617 = 363 \\
1617/363 &= 4 \quad 1617 - 4 \times 363 = 165 \\
363/165 &= 2 \quad 363 - 2 \times 165 = 33 \\
5/33 &= 5 \quad 165 - 5 \times 33 = 0
\end{align*}
\]
Thus the greatest common divisor is 33.

11. Write a function printOctal() to find the octal equivalent of a given decimal integer using recursion and print it.
1. Write a function `max()` to find the minimum of two float numbers and call it from `main()` and print the value.

2. A popular method of message encryption involves replacing each letter of the message by the one that follows it in the alphabet. For example, the word HAL becomes IBM, since I follows H, B follows A and M follows L. Since no letter follows Z, it is replaced with A, so that ZAP becomes ABQ. Write a function `encrypt(char, char, char)` to encrypt three letter words where each character is read individually.

3. Write a temperature conversion function. The function should take two arguments, the first being temperature and the second being a letter indicating whether the temperature is in Celsius or Fahrenheit. If the temperature is in Fahrenheit, the function should calculate and return the Celsius equivalent. Similarly, if a Celsius temperature is entered your program should be converted to Fahrenheit.

4. You are a person in ChocoLand. Here, people eat chocolates daily instead of normal food. There is only one shop near your home; this shop is closed on Sunday, but open on all other days of the week. You may buy at most one box of N chocolates from this shop on each day when it is open. Currently, it's Monday, and you need to survive for the next S days (including the current day). You have to eat K chocolates everyday (including the current day) to survive. Do note that you are allowed to buy a chocolate box and start eating from the same day itself. Also note that you don’t have any chocolates as of today. Compute the minimum number of days on which you need to buy from the shop so that you can survive the next S days, or determine that it isn’t possible to survive. Write a C program using a function `survive_in_chocoland( int N, int K, int S)` that takes the values of the size of a chocolate box (N), number of days to survive (S) and number of chocolates to be eaten everyday (K) from `main` and returns the minimum number of days on which you need to buy the chocolate box and -1 if survival is not possible. Test cases: 16 2 10 answer:2, 50 48 7 answer: -1, 7 1 7 answer: 1;input format: N K S

5. Write a C program to read the month of the year (in numeric format) as input and then display the number of days in the given month using switch
case. (Do not consider the case of leap year. You can consider 28 days for the month of February).

Test Case
(i) Input: 4
   Output: The number of days in the given month is 30.
(ii) Input: 2
    Output: The number of days in the given month is 28.
(iii) Input: 7
    Output: The number of days in the given month is 31.
(iv) Input: 8
    Output: The number of days in the given month is 31.

6. Write a C function which counts how many numbers are prime between 1 to N (both are exclusive). Input will be integer N.
   i) Input: 100  Output: 25
   ii) Input: 50  Output: 15

7. Write a program that reads in a single number, then reads every single digit and determines whether the first number contains the digit. If it does, the program should display how many times that digit occurs in the number.

8. Write a function getFactorial() to find factorial of any integer number using recursion.

9. Write a recursive function getSum() to obtain the sum of first n natural numbers.

10. Write a function getGCD() to compute the greatest common divisor given by Euclid’s algorithm using recursion, exemplified for J=1980 and K = 1617 as follows:
   \[
   \begin{align*}
   1980 / 1617 &= 1 \\
   1980 - 1 \times 1617 &= 363 \\
   1617 / 363 &= 4 \\
   1617 - 4 \times 363 &= 165 \\
   363 / 165 &= 2 \\
   363 - 2 \times 165 &= 33 \\
   5 / 33 &= 5 \\
   165 - 5 \times 33 &= 0 
   \end{align*}
   \]
   Thus the greatest common divisor is 33.

11. Write a function printHexadecimal() to find the hexadecimal equivalent of a given decimal integer using recursion and print it.
1. Write a function max() to find the minimum of two float numbers and call it from main() and print the value.

2. Write a C program to check whether a number is divisible by 5 and 11 or not using if else statements.

3. C program to calculate tax, given the following conditions
   I. if income is less than, 1,50,000 then no tax
   II. if taxable income is in the range 1,50,001-300,000 then charge 10% tax
   III. if taxable income is in the range 3,00,001-500,000 then charge 20% tax

4. Write a C program to input marks of five subjects Physics, Chemistry, Biology, Mathematics and Computer, calculate percentage and grade according to given conditions: marks are out of 100

   If percentage >= 90% : Grade A
   If percentage >= 80% : Grade B
   If percentage >= 70% : Grade C
   If percentage >= 60% : Grade D
   If percentage >= 40% : Grade E
   If percentage < 40% : Grade F
   i) input: 90 95 85 88 92
   ii) output: 90.00% Grade A

5. Write a C program using a function frequency (int number) which receives an integer from main(), and displays the number of frequency of digits in the number.
   Example:
   Input:
   123
   Output:
   Frequency of 1 = 1
   Frequency of 2 = 1
   Frequency of 3 = 1
   Test cases: 10, 5678, 34, 192
6. Write a C program which takes integer n as input and returns number of digits it contains.
   Input: 12456
   Output: 5
   Input: 0
   Output: 1
   Input: -12566
   Output: 5

7. Amicable numbers are two different numbers so related that the sum of the proper divisors of each is equal to the other number. (A proper divisor of a number is a positive factor of that number other than the number itself. The proper divisors of 6 are 1, 2, and 3). The numbers 220 and 284 are amicable numbers. Since the sum of proper divisors of 220 is equal to 284, and the sum of proper divisors of 284 is equal to 220. Write a function isAmicable() to check whether the entered numbers are amicable numbers or not.

8. Write a function getFactorial() to find factorial of any integer number using recursion.

9. A positive number is entered through the keyboard, write a function to calculate sum of digits of the number using recursion.

10. The Fibonacci numbers are the numbers in the following integer sequence.
    0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, .......
    Write a function printFibonacci() to print first N terms of Fibonacci series using recursion.
    (For N >2)
    i) Input: 5
       Output: 0 1 1 2 3
    ii) Input: 10
        Output: 0 1 1 2 3 5 8 13 21 34

11. Write a function getGCD() to compute the greatest common divisor given by Euclid’s algorithm using recursion, exemplified for J=1980 and K = 1617 as follows:
    1980/1617 = 1  1980 -1*1617 = 363
    1617/363 = 4  1617-4*363 = 165
    363/165=2  363-2*165=3
    5/33 = 5  165-5*33 = 0