Rules for assignment:

1. You must write down **explanation** with example of each solution code in paper. Also attach the screenshot of code with input output.
2. In each output you must first print your **Department, Name and ID**. Then the program output should be followed.
3. In written document you must write **your ID and page number** in upper right corner.
4. Attach all the pages sequentially and submit the file in **.pdf** format.
5. Your file name should be **your ID**.
6. Submit your assignment in this form:

   https://forms.gle/TTKAh66TZQ45TMhAA

7. Submission Deadline: **Friday (29-04-2022) 11:59 PM**.
8. You can submit your file **only once.**

1. Write a C program that takes number of units consumed by the customer and returns calculated Electricity Bill as per following conditions:
    - First 100 Units will be charged at $1/unit.
    - Next 100 Units will be charged at $2/unit.
    - Next 100 Units will be charged at $3/unit.
    - Next 200 Units will be charged at $4/unit.
    - Next Units will be charged at $5/unit.
    - 10% tax to be added in the final amount.
    - Extra $15 to be added for Meter Charge.

Sample Input: 100	Sample Output: 125 // 100 + 10 + 15=125
Sample Input: 225	Sample Output: 427.50 // 100+200+75+37.5+15=427.50
Sample Input: 300	Sample Output: 675 // 100+200+300+60+15=675

2. Write a C program that takes three dimensions of a brick: height(a), width(b) and depth(c) and outputs true if this brick can fit into a hole with the width(w) and height(h).
    - You can turn the brick with any side towards the hole.
    - We assume that the brick fits if its sizes equal the ones of the hole (i.e. brick size should be less than or equal to the size of the hole, not strictly less).
    - You can't put a brick in at a non-orthogonal angle.

Sample Input: 1,1,1,1,1	Sample Output: True
Sample Input: 1, 2, 1, 1, 1	Sample Output: True
Sample Input: 1, 2, 2, 1, 1	Sample Output: False

3. An employee working at a very bizarre company earns one dollar on their first day. However, for every day that passes, their base amount doubles, so they earn two dollars on the second day and four dollars on the third day (totalling 7 dollars). Given a number of days, print how many dollars the employee accumulates.

Sample Input: 1	Sample Output: 1
Sample Input: 2	Sample Output: 3
Sample Input: 3	Sample Output: 7

4. Write a program that takes the month and year (as integers) and returns the number of days in that month.

Sample Input: 2, 2020	Sample Output: 29
Sample Input: 4, 654	Sample Output: 30
Sample Input: 2, 1000	Sample Output: 28

5. Imagine you work in a toy car workshop, and your job is to build toy cars from a collection of parts. Each toy car needs 4 wheels, 1 car body, and 2 figures of people to be placed inside. Given the total number of wheels, car bodies and figures available, how many complete toy cars can you make?

Sample Input: 2, 48, 76 // 2 wheels, 48 car bodies and 76 figures	Sample Output: 0
Sample Input: 43, 15, 87 // 43 wheels, 15 car bodies and 87 figures	Sample Output: 10
Sample Input: 88, 37, 17 // 88 wheels, 37 car bodies and 17 figures	Sample Output: 8

6. In Mathematics Primorial denoted by '#' is a function from natural number to natural number similar to factorial function, but rather than successively multiplying positive integers, the function only multiplies prime numbers.
   Now, write a C program that takes a number as input and outputs its primorial.

Sample Input: 1	Sample Output: 2 //First prime number=2
Sample Input: 2	Sample Output: 6 //Product of first two prime numbers 2*3=6
Sample Input: 6	Sample Output: 30030

7. Write a C program that takes three numbers — the width and height of a rectangle, and the radius of a circle — and prints true if the rectangle can fit inside the circle, false if it can't.

Sample Input: 8, 6, 5	Sample Output: True
Sample Input: 5, 9, 5	Sample Output: False

Sample Input: 4, 7, 4	Sample Output: False

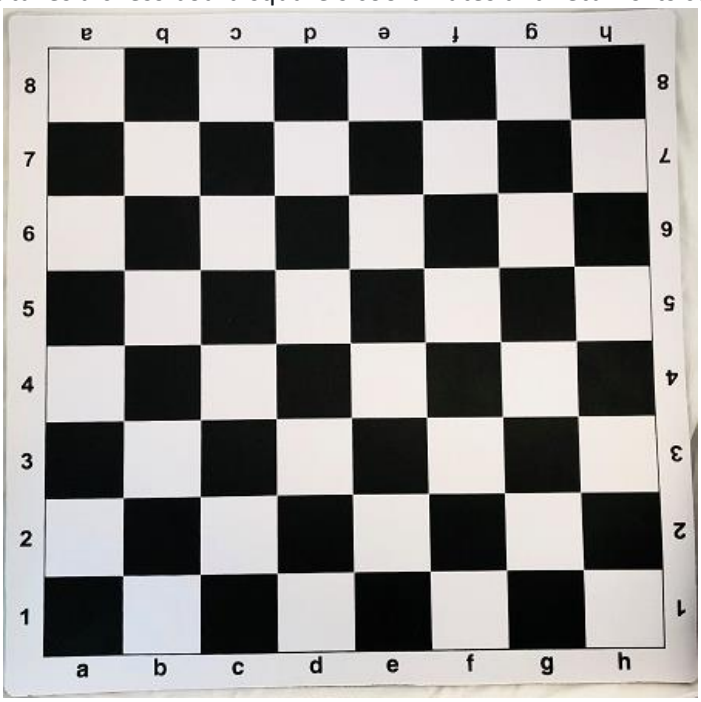
8. This problem is called FizzBuzz problem where you have to write a C program in such a way so that it prints sequence of numbers upto N terms and for multiples of 3 it should print “Fizz” and for multiples of 5 it should print “Buzz” instead of the number. And for numbers which are multiples of both 3 and 5 it should print “FizzBuzz” instead of the number.

Sample Input: N=10	Sample Output: 1 2 Fizz 4 Buzz Fizz 7 8 Fizz Buzz
Sample Input: N=15	Sample Output: 1 2 Fizz 4 Buzz Fizz 7 8 Fizz Buzz 11 Fizz 13 14 FizzBuzz

9. For this problem you need to calculate the weekly salary of a worker for his working hours. This program takes a list of hours worked each day. A worker earns $10 for the first 8 hours. For overtime hours he earns $15. On weekends the employer pays double the usual rate. For example 10 hours worked on a weekday would pay 80+30=$110 but on weekend it would be 160+60=220

Sample Input: 8 8 8 8 8 0 0	Sample Output: 400
Sample Input: 10 10 10 0 8 0 0	Sample Output: 410
Sample Input: 0 0 0 0 0 12 0	Sample Output: 280

10. Write a C program that takes a chess board square’s coordinates and returns its color.



Sample Input: a 1	Sample Output: black
Sample Input: e 5	Sample Output: black
Sample Input: d 1	Sample Output: white

11. Write a C program to check whether a number is magic or not. (A number is said to be a magic number if the sum of its digits are calculated till a single digit and this single digit comes out to be 1)

Sample Input: 50113 //5+0+1+1+3=10 //1+0=1	Sample Input: 1234 //1+2+3+4=10 //1+0=1	Sample Input: 12345 //1+2+3+4+5=15 //1+5=6
Sample Output: This is a magic number	Sample Output: This is a magic number	Sample Output: This is not a magic number

12. Mr. X is interested to know about his zodiac sign and he asks you for help. Write a program that takes birth date as input and returns the corresponding zodiac sign with personality prediction message.

Zodiac sign	Date	personality
Capricorn	December 22 – January 19	Clever
Aquarius	January 20 – February 17	Sincere
Pisces	February 18 – March 19	Creative
Aries	March 20 – April 19	Bright
Taurus	April 20 – May 20	Strong
Gemini	May 21 – June 20	Witty
Cancer	June 21 – July 22	Compassionate
Leo	July 23 – August 22	Proud
Virgo	August 23 -September 22	Kind
Libra	September 23 – October 22	Peaceful
Scorpio	October 23 – November 21	Bold
Sagittarius	November 22 – December 21	Honest

Your input must be in DDMMYY form for example if someone born in 29 October 2012 then the input value will be 291012.

Sample Input: 291012	Sample Output: “Scorpio” “You are bold”
Sample Input: 170396	Sample Output: “Pisces” “You are creative”
Sample Input: 270905	Sample Output: “Libra” “You are peaceful”

13. Write a program in C to display the sum of the series [1+x+x^2/2!+x^3/3!+....] up to a specific number of terms.

Sample Input: x=3 Number of terms=5	Sample Output: 16.375
Sample Input: x=1 Number of terms=10	Sample Output: 2.718282
Sample Input: x=5 Number of terms=8	Sample Output: 128.619064

14. Write a program that prints the following diamond pattern based on number of row input.

If number of row is 3	If number of row is 4

<pre> *
 ***
*****
 ***
  *</pre>
	<pre> *
	  ***
	 *****
	*******
	 *****
	  ***
	   *</pre>

15. Write a program that prints right arrow pattern based on input.

If input is 3	If input is 5

<pre>***
  **
   *
  **
***</pre>
	<pre>*****
	 ****
	  ***
	   **
	    *
	   **
	  ***
	 ****
	*****</pre>