Submission Guidelines – Please carefully read the following instructions for submission of the assignment.

- ✓ Please submit the assignment before the deadline. It should be clear that submission after due date would not be considered.
- ✓ In case plagiarism strict actions will be taken. You are advised to not copied solution from any other student.
- ✓ If you find any confusion in assignment (Question statement), please consult with the course teacher before the deadline. After the deadline no queries will be entertained in this regard.
- ✓ **Submission:** Submission will only be accepted through GOOGLE CLASSROOM. If you are asked to write programs, then submit the source files. If you are asked to draw flow chart or write pseudo codes, then scan or take pictures of all your paper work and submit a single pdf file of the paper work. Before submission, rename your pdf file with your roll number.

1. [CLO2] Given two numbers A and B (entered by a user), write a program to check if A and B are in the golden ratio. Golden Ratio: Two numbers are said to be in the golden ratio if their ratio is the same as the ratio of the sum of the two numbers to the larger number.

$$\frac{A+B}{A} = \frac{A}{B} = 1.618,$$

   Where A > B > 0.
2. [CLO2] A famous restaurant in town offers the year's biggest sale on its entire menu, but with certain conditions. The 25% discount offer is valid for every bill exceeding Rs: 1500/- for lunch and 20% for dinner. An additional 10% for take away at lunch and 5% at dinner and 15% for mid-night. The restaurant also announced a special happy hour deal any time in a given day, where 50% discount is offer straight away but not exceeding Rs: 2500/-. Note: No discount is offered if the payment is made using Credit / Debit card. Write a program to calculate the customer bill for the given order.
3. [CLO2] Imagine you are hired by an agency to encode the message comprising of digits. Your task is to write a 'C-program' that would work on any generic input. The key factors of the encoding scheme are listed below:

Sample Input 1: 24531 **Sample Output 1:** 15	**Sample Input 2:** 4532 **Sample Output 2:** 52

   a) Each digit in the input would be considered in the range 1-9 only.
   b) Each digit in the input would occur only once.
   c) If the input number has an even number of digits, then the encoding message would contain the maximum number from input as its first digit and the minimum number from input as its second digit.
   d) If the input number has an odd number of digits, then the encoding message would contain the minimum number from input as its first digit and the maximum number from input as its second digit.
4. [CLO2] Write a 'C' program that takes start and end time from the user in an analog format and your challenge is to design a digital clock that will display Hours, Minutes and Seconds on a console from user provided start and end time. The program sample input/output will be as follows:
   Enter Small Needle: 10
   Enter large Needle: 12
   Enter largest Needle: 07
   Digital Clock: 10: 00: 35
   Hint: You may use sleep( ) function in order to wait for a current thread for a specified time.
5. [CLO1] Write pseudo code and draw flowchart for a program that reads a 4 digit (or fewer) positive integer and determines how many digits in the integer are equal to the last digit of your Roll number, and prints the result on the screen. If a user enters a negative integer or an integer greater than 4 digits, print a message on the screen: “Invalid input, Enter a valid integer.”
6. [CLO1] Calculate the value of π by using the following infinite series.

$$\pi = 4 - \frac{4}{3} + \frac{4}{5} - \frac{4}{7} + \frac{4}{9} - \frac{4}{11} + \cdots$$

   Print a table that shows the value of π approximated by one term, by two terms, by three terms, and so on, of this series. How many terms of this series do you have to use to get 3.14?
7. [CLO1] A palindrome is a number or a text phrase that reads the same backward as forward. For example, each of the following five-digit integers is a palindrome: 12321, 55555, 45554 and 11611. Draw flowchart and write pseudo code for a program that reads a five-digit integer and determines whether or not it is a palindrome. Also, the program prints error if the number of digits is greater than 5.

8. [CLO1] Identify and correct the errors in each of the following statements:

a. scanf("d", value);
b. printf("The product of %d and %d is %d"\n, x, y);
c. firstNumber + secondNumber = sumOfNumbers
d. if (number => largest)
   largest == number;
e. */ Program to determine the largest of three integers /*
f. Scanf("%d", anInteger);
g. printf("Remainder of %d divided by %d is\n", x, y, x % y);
h. if (x = y);
   printf(%d is equal to %d\n", x, y);
i. print("The sum is %d\n," x + y);
j. Printf("The value you entered is: %d\n, &value);
k. int x = 1, total;
   while (x <= 10) {
   total += x;
   ++x; }
l. While (x <= 100)
   total += x;
   ++x;
m. while (y > 0) {
   printf("%d\n", y);
   ++y; }
n. For (x = 100, x >= 1, ++x)
   printf("%d\n", x);
o. The following code should print whether a given integer is odd or even:
   switch (value % 2) {
   case 0:
   puts("Even integer");
   case 1:
   puts("Odd integer"); }
p. The following code should input an integer and a character and print them. Assume the
   user types as input 100 A.
   scanf("%d", &intVal);
   charVal = getchar();
   printf("Integer: %d\nCharacter: %c\n", intVal, charVal);
q. for (x = .000001; x == .0001; x += .000001) {
   printf("%.7f\n", x); }
r. The following code should output the odd integers from 999 to 1:
   for (x = 999; x >= 1; x += 2) {
   printf("%d\n", x); }
s. The following code should output the even integers from 2 to 100:
   counter = 2;
   Do {
   if (counter % 2 == 0) {
   printf("%u\n", counter); }
   counter += 2;
   } While (counter < 100);
t. The following code should sum the integers from 100 to 150 (assume total is initialized to 0):
   for (x = 100; x <= 150; ++x); {
   total += x;
   }