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**INF212**

**ALGORITHMS AND PROGRAMMING**

**PROJECT-1**

**Printing Numbers to an LCD Screen**

**The deadline is Wednesday, April 3, 2024, at 00:00.**

**Projects that are not delivered on time are not accepted.**

**Upload the project to the Project 1 assignment section of the INF212 class.**

**The questions can be asked to course lecturer Doç. Dr. Tuba GÖZEL and teaching assistant Ahmet Erdem YILMAZ, Muhammed Faruk KARABAY and Dr. Mert Bekir ATSEVER.**

**Upload your files as followings:**

* **After uploading your report and source files, you must use TURN IN button (GÖNDER butonu) in the system, otherwise it will be a draft of your version and will not be accepted.**
* **MS Teams “**INF212**” class is the directory for your files.**
* **Do not create a folder or RAR or whatever, just UPLOAD your source codes.**
* **Report (\*.docx) and source files (ardunio code, \*.ino; all code as C file \*.c ) must be named as “INF212\_P1\_IDXXX”.**

**PROJECT 1**

1. Create the Ardunio circuit with LCD from Tinkercad.   
   (i.e., <https://www.tinkercad.com/projects/Create-a-Choice-based-Text-Adventure-Game-With-Tin> )
2. Compose the Arduino code to sequentially flash on an LCD screen the hexadecimal equivalents of the first 2 and last 2 digits of your student number and the result of the area calculation. (50 Points)
3. The relevant codes should be loaded onto an Arduino circuit established using Tinkercad (https://www.tinkercad.com/), and the codes should be tested and presented by you through Tinkercad to the teaching asistants. (40 points)
4. Prepare a report that includes the ardunio circuit, codes and LCD outputs by using INF212\_Project\_Report\_Template.docx. (10 points)

For the area calculation:

First, determine the function f(x) =a\*x^2 + b\*x +c by calculating the coeffiencies a, b, c with your student number (ID).   
a= ID\_first\_two\_number, b= ID\_last\_third\_forth\_number, c= ID\_last\_two\_number

(i.e. ID=241024029 f(x)=24\*X^2 + 40\*X + 29 )

Second, calculate the area of f(x) between **x0** and **x1** with the interval **step** that **x0** is the minimum number of ID, **x1** is the maximum number of ID and **step** is the percentage of ID average numbers. (i.e., ID=241024029, x0=0, x1=9, step=(2+4+1+0+2+4+0+2+9)/9/100 )

1. Create and use the following functions to carry out the above tasks:

* To obtain the coefficiencies a, b, c;  
  int takenumber (int ID, int flag, int initial, int number)

For a, b, c you can call function as   
a=takenumber(ID, 0, 1, 2);

b=takenumber(ID, 1, 4, 2);

c=takenumber(ID, 1, 2,2);

* To obtain x0, x1 and step;

int minnumber (int ID);

int maxnumber (int ID);

float average (int ID);

* To calculate the area of function;

float area( int a, int b, int c, int x0, int x1, float step);

1. Convert the first two and last number of your student number to hexadecimal number. (i.e. (24)10 = (18)16 , (29)10 = (1D)16 )

* To convert the decimal to hexadecimal;

char dec2hexa ( int number, int flag )

For first two number you can call function twice as follows;

firsthexa = dec2hexa(24, 0); -🡪 firsthexa=’1’

secondhexa = dec2hexa(24,1); -🡪 secondhexa=’8’