PROGRAMMING AND PROBLEM SOLVING (SE 1105) MIDTERM	A	Grading				
		Q1	Q2	Q3	Q4	Σ

Instructors	ID #	Name-Surname	Time allowed	Date/Room #
Dr. Dindar ÖZ Dr. Faegheh YEGANLI			80 mins.	October 26, 2022 (18:40-20:00) Y-011, Y107, Y111

Notes: If you believe that necessary data or assumptions are missing from the problem statement, make your own assumption(s) and write them clearly.

QUESTIONS

1. **(30 pts.)** Write the outputs of the following programs.

a) (15pts)

```
#include "stdio.h"

void main()
{
    int nums[] = {0,1,2,3,4,5};
    int sums[6];
    sums[0]= nums[0];

    printf("{");

    for(int i=1;i<6;i++)
    {
        if (i%2==0)
            sums[i] = sums[i-1]+nums[i];
        else
            sums[i] = sums[i-1]-nums[i];

        printf("%d,",sums[i]);
    }

    printf("}");
}
```

b) (15pts)

```
#include "stdio.h"

int func2(int a,int b)
{
    printf("%d %d\n",a+4,b-5);
    a = a+b;
    b = b-1;
    return a+b;
}

int func1(int a[], int b)
{
    printf("%d %d %d\n",a[b], b, a[a[0]]);
    b=b+1;
    a[1]= func2(a[b],b);
    printf("%d %d %d\n",a[b], b, a[a[0]]);
    return a[1]+b;
}

int main() {
    int a[]= {1,2,3,4,5};
    a[3]=func1(a,0);
    for(int i=1; i<5;i+=2)
        printf("%d-",a[i]);
    return 0;
}
```

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2. **(20 pts.)** Write a function that takes an integer parameter n and calculates and returns the following:

$$\big|\,|2 \times n - 7| - |3 \times n - 5|\,\big|$$

(| x | means the absolute value of x)

Note: You can not call any functions unless you implement that function here yourself.

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3. **(25 pts.) The neighbor sum** of an element in an array is the sum of the elements that are adjacent to that element (i.e., the Neighbor sum of a[i] = a[i-1]+ a[i+1] if those indices exist). Write a function that takes an array of real numbers (`double`) and its size as parameters. The function should return the element that has the maximum neighbor sum.
   (**Example-1:** If the array= `{ 1.0, 9.1, -2.1, 3.5, 7.8, 8.0, -3.1, 10.0 }` Then the element `-3.1` has the maximum neighbor sum: `8.0 + 10.0` so function returns `-3.1`)
   (**Example-2:** If the array= `{ 0.5, 6.3, -2.1, -3.5, 1.8, -8.0, 2.1 }` Then the element `0.5` has the maximum neighbor sum: `6.3` so function returns `0.5`)

Note: You can assume that the size of the array will be at least 2, and all elements have different neighbor sums.

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4. **(25 pts**.) A rabbit jumps ***m*** times on the first day of the year. After that, each day, it makes ***n*** jumps more than the previous day. If the rabbit ever makes more than 50 jumps in one day, it gets tired and rests for the next day (makes 0 jumps) and continues jumping the same way after the next day.
   Write a function that takes m and n as parameters and prints the number of jumps the rabbit is making on each day line by line until the day that the rabbit makes its 1000^{th} jump of the year. (including that day)

Good luck…