Istanbul Atlas University
FACULTY OF ENGINEERING AND NATURAL SCIENCES
2024-2025 Fall Semester

Course title & Code	Programming I (1400111009)			
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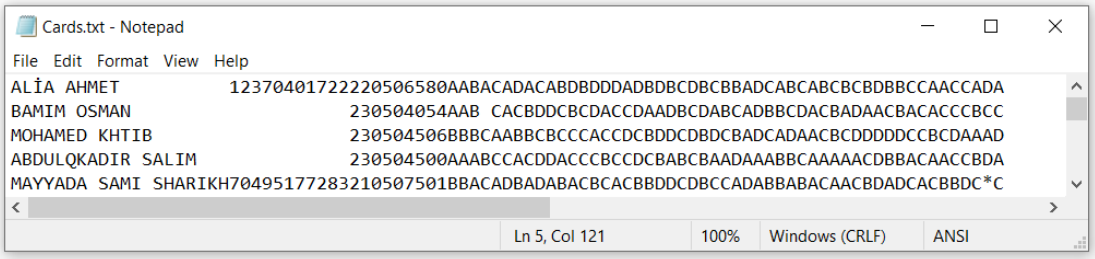
Section*	1	2	3	4	5	6

Assignment	Description	Weight	Grade
HW1	Write a C program to print 3 lines on the console window: the first line is your ID and full name, the second line is the number of your course section, and the last line is the name of your lab teaching assistant.	2	
LAB1	Verify the code introduced in the second tutorial slides and modify it so that the user enters the length and width variables using the keyboard and scanf () function. Late submission will be allowed during next week lab sessions	2	
HW2	You are asked to write a simple program to writes a large letter I on the screen using instructions you learned at class. Hint: Refer to exercise 9 page 62 in your text book. Simplify the program by avoiding the usage of statements not introduced at our class	2	
LAB2	Write a program to enter the GPA out of 4.0 and display it as a percentage on the screen.	2	
HW3	Write a C program to display a clock type timer on the screen starting from 00:00:00 till 23:59:59 and then restart from beginning. You may use the sleep (1) function to cause a 1 second delay in the loop.	2	
LAB3	Write a program to enter 10 integer numbers and store them in an array. The find and print the maximum number and the minimum number. OR Write C Code to calculate the area of a rectangle. Ask the user to enter the length and width of the rectangle, then calculate the area and print it to the screen. (Use scanf)	2	
HW4	Write a C program that ciphers and deciphers a user-provided string using the Caesar cipher technique. The program will prompt the user to enter a string and then to enter a key. Based on the key, the program will display the modified string as follows: • If the key is zero, the string will be printed unchanged. • If the key is positive, the string will be encrypted by adding the key value to the ASCII code of each character in the string. • If the key is negative, the string will be decrypted by subtracting the absolute value of the key from the ASCII code of each character in the string. We assume that the user will input a string without any whitespace and provide a reasonable value for the key.	2	
LAB4	Write a program to enter 10 random numbers ranging from 0 to 100, then calculate and display their maximum value, minimum value, and average value.	2	
Exam Rules OR LAB5	Attached is a sample cover page for the midterm exam along with some multiple-choice questions (MCQs). Please read the rules carefully, prepare for the exam, and respond to the following question: Do you understand the exam rules? Alternatively, Create a file named "example.txt" (Check if the file exists and is opened.), takes input from the user, writes that input to the file, and then reads and prints the content of the file.	1	
TPPR	Write a short report (approximately 2 pages in PDF format) detailing your progress on the term project by Week 11. At least, you are expected to decompose the program to three functions, one function to read the Cards file into a set of arrays. The second function to calculate the Grads array. The third function to write the grads file. At this stage you are expected to finish the first and third functions.	3	
Lab Report	Prepare hardcopies of your answers to the above assignments each one in a separate page with a header containing the assignment title and put them in a file and show it to your lab assistant for evaluation.	2	
TPCP	Submit the C program of your term project to the LMS system before the announced deadline. Also, include its hard copy in your lab file and submit the file to your lab assistant during Week 14.	8	
Total		30	

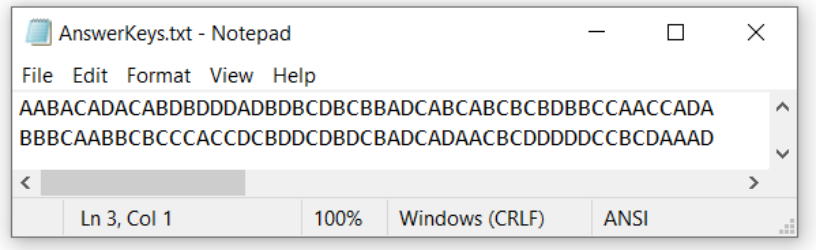
Term Project

The optical card reader machine generates a text file similar to the one shown below



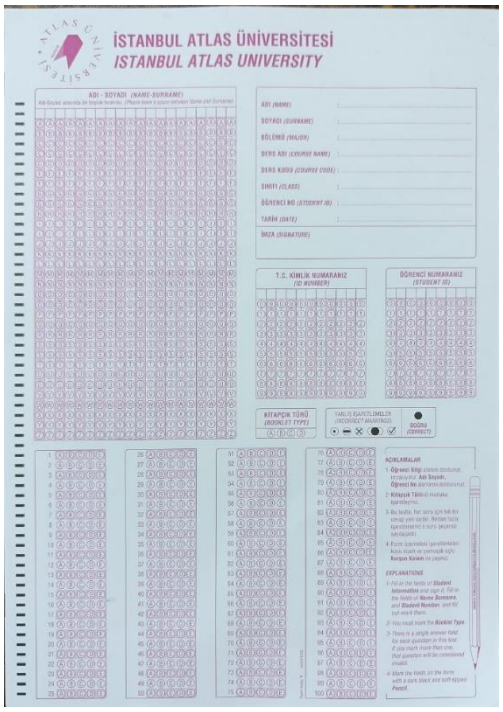
Each line in the file corresponds to the data read from one optical card. The line format is as follows:
01-20 The student's name
21-32 The student's TC number
33-41 The student's ID number
42 The booklet type
43-142 The Answers of 100 MCQs

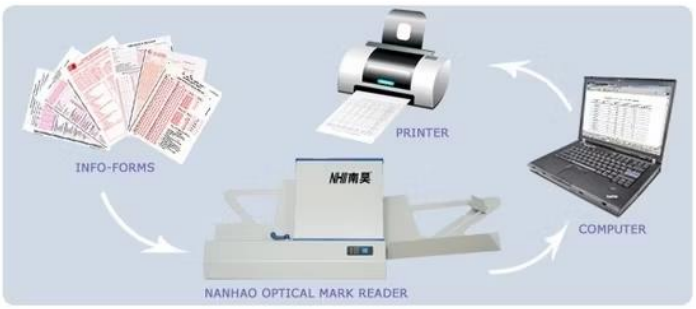
Users of the machine prepare the answer keys in another file similar to the one below:



Each line in the file corresponds to the answer key of one booklet type where the first character corresponds to the booklet type (booklet type ∈ {A, B, C, D}) and the remaining characters are the correct choices of the MCQ.

In this project, you will create a C program to read both files and generate the Grads and Statistics files. You will be guided to develop the final software progressively and demonstrate your progress to your teaching assistant during lab sessions.





The previous page describes how you will report your term project along with all your previous submittals. Use that page as a cover page for your final hard copy submittal. Don't forget to mark your section and your program (department).

By turning in what you finished you claim that this is your work so that you should be able to answer any questions. Failure to answer any of the questions your TA or I may ask will result in a failure in the project. Remember that this project should be done individually and searching/reading/studying the internet is encouraged and you can even discuss with us your implementation to get your opinion on it.

Project

In this project, our goal is to have the names and surnames of the individuals we have.TC identification number, school ID, booklet type, and the answers given to 100 questions were used to create the necessary files and code components, after which our system automatically calculates the correct and incorrect answers and generates the class average. After creating the necessary files within the text files, they were all compiled into one file and presented for your review.

Reports by Week

Week1; In the first week, we learned about the IDEs we would use for coding (Code blocks, online Gdb, Dev C++) and then wrote Hello World.

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
   printf("Hello world!\n");
   return 0;
}
```

Week 2; We printed out a large letter W.

```
#include <stdio.h>

int main()
{
   printf("W       W\n");
   printf("W   W   W\n");
   printf("W W   W W\n");
   printf("W       W\n");
   printf("W       W\n");

   return 0;
}
```

Week 3-4-5; In these weeks, we learned how to calculate time, calculate circles and rectangles, and prepare a counter.

Week 7 ; Since the midterms have started, we didn't do any special study for any week.

Week 6 ; Write a C program that asks the user to enter 10 numbers and calculates the sum of odd and even numbers separately. We learned to develop and solve such problems.

```c
int main() {
    int numbers[10];
    int evenSum = 0, oddSum = 0;

    // Prompt the user to enter 10 numbers
    printf("Enter 10 numbers:\n");
    for (int i = 0; i < 10; i++) {
        printf("%d. Enter number: ", i + 1);
        scanf("%d", &numbers[i]);
    }

    // Calculate the sum of even and odd numbers
    for (int i = 0; i < 10; i++) {
        if (numbers[i] % 2 == 0) {
            evenSum += numbers[i]; // Sum of even numbers
        } else {
            oddSum += numbers[i];  // Sum of odd numbers
        }
    }

    // Display the results
    printf("Sum of even numbers: %d\n", evenSum);
    printf("Sum of odd numbers: %d\n", oddSum);

    return 0;
}
```

Week 8 -9 ; We learned how to use do-while loops and how to limit loops. We used the sleep function to restrict infinite loops.

```c
// program to find the sum of positive numbers
// If the user enters a negative number, the loop ends
// the negative number entered is not added to the sum

#include <stdio.h>

int main() {
    int number;
    int sum = 0;

    // take input from the user5

    printf("Enter a number: ");
    scanf("%d", &number);

    while (number >= 0) {
        // add all positive numbers
        sum += number;

        // take input again if the number is positive
        printf("Enter a number: ");
        scanf("%d", &number);
    }

    // display the sum
    printf("\nThe sum is %d\n", sum);

    return 0;
}
```

```
Enter a number: 4
Enter a number: 7
Enter a number: 8
Enter a number: 8
Enter a number: 9
Enter a number: 5
Enter a number: 6
Enter a number: 8
Enter a number: 6
Enter a number: 1
Enter a number: 4
Enter a number: 6
Enter a number: 6
Enter a number: 5
Enter a number: 6
Enter a number: 6
Enter a number: 5
Enter a number: -1

The sum is 100
```

```c
#include <stdio.h>

int main() {
    int number;
    int sum = 0;

    // Take input from the user
    do {
        printf("Enter a number (negative number to end): ");
        scanf("%d", &number);

        // If the number is non-negative, add it to the sum
        if (number >= 0) {
            sum += number;
        }

    } while (number >= 0); // Continue until a negative number is entered

    // Display the sum
    printf("\nThe sum is %d\n", sum);

    return 0;
}
```

Week 10-11; In these weeks, we learned about file creation, opening and closing, and playing text files within the software we developed, which is the current topic of our project.

Explanation

Grades.txt

Ω The Grades.txt file was left empty for the processing of information with the created codes.

AnswerKeys.txt

Ω The AnswerKeys.txt file is a text file where we separate the type of booklet for the entered exam and the answers to the 100-question exam according to the booklet type.

Cards.txt

Ω The Cards.txt file contains text files that include students' first and last names, identification numbers, school IDs, booklet types, and the answers they provided to the questions, in order.