

**PROGRAMMING FUNDAMENTALS**  
**LAB**  
**ASSIGNMENT – 5**

**MASHHOOD RIAZ**

**24K – 0530**

**FAST NUCES KCI**

## SECTION 1; Q1)

```
File    Edit    View

#include <stdio.h>

int main() {
    int age;

    printf("Enter your age: ");
    scanf("%d", &age);

    if (age < 0) {
        printf("Invalid age. Please enter a non-negative integer.");
    } else if (age <= 12) {
        printf("You are a Child.");
    } else if (age <= 19) {
        printf("You are a Teenager.");
    } else if (age <= 64) {
        printf("You are an Adult.");
    } else {
        printf("You are a Senior.");
    }

    return 0;
}
```

```
C:\Windows\System32\cmd.e  X  +  v

Microsoft Windows [Version 10.0.22631.4169]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Hp\Documents\24k-0530 pflab5>gcc s1q1.c -o s1q1.exe

C:\Users\Hp\Documents\24k-0530 pflab5>s1q1.exe
Enter your age: 2
You are a Child.
C:\Users\Hp\Documents\24k-0530 pflab5>s1q1.exe
Enter your age: 19
You are a Teenager.
C:\Users\Hp\Documents\24k-0530 pflab5>s1q1.exe
Enter your age: 52
You are an Adult.
C:\Users\Hp\Documents\24k-0530 pflab5>s1q1.exe
Enter your age: 69
You are a Senior.
C:\Users\Hp\Documents\24k-0530 pflab5>
```

## SECTION 1; Q2)

File Edit View

```
#include <stdio.h>

int main() {
    int num;

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

    if (num == 0) {
        printf("You entered zero.");
    } else {
        if (num > 0) {
            if (num % 2 == 0) {
                printf("%d is a positive even number.", num);
            } else {
                printf("%d is a positive odd number.", num);
            }
        } else {
            printf("%d is a negative number.", num);
        }
    }

    return 0;
}
```

```
C:\Windows\System32\cmd.e  X  +  v
Microsoft Windows [Version 10.0.22631.4169]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Hp\Documents\24k-0530 pflab5>gcc s1q2.c -o s1q2.exe

C:\Users\Hp\Documents\24k-0530 pflab5>s1q2.exe
Enter a number: 0
You entered zero.
C:\Users\Hp\Documents\24k-0530 pflab5>s1q2.exe
Enter a number: 5
5 is a positive odd number.
C:\Users\Hp\Documents\24k-0530 pflab5>s1q2.exe
Enter a number: 6
6 is a positive even number.
C:\Users\Hp\Documents\24k-0530 pflab5>s1q2.exe
Enter a number: -2
-2 is a negative number.
C:\Users\Hp\Documents\24k-0530 pflab5>|
```

## SECTION 2; Q1)

File Edit View

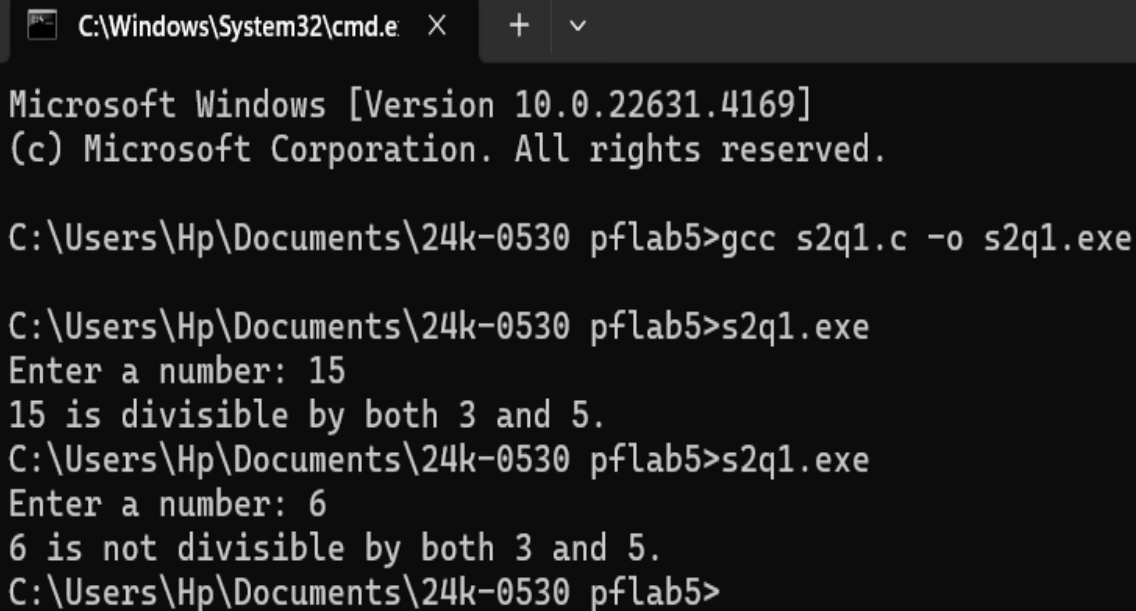
```
#include <stdio.h>

int main() {
    int num;

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

    if (num % 3 == 0 && num % 5 == 0) {
        printf("%d is divisible by both 3 and 5.", num);
    } else {
        printf("%d is not divisible by both 3 and 5.", num);
    }

    return 0;
}
```



C:\Windows\System32\cmd.e × + ▾

Microsoft Windows [Version 10.0.22631.4169]  
(c) Microsoft Corporation. All rights reserved.

C:\Users\Hp\Documents\24k-0530 pflab5>gcc s2q1.c -o s2q1.exe

C:\Users\Hp\Documents\24k-0530 pflab5>s2q1.exe  
Enter a number: 15  
15 is divisible by both 3 and 5.

C:\Users\Hp\Documents\24k-0530 pflab5>s2q1.exe  
Enter a number: 6  
6 is not divisible by both 3 and 5.

C:\Users\Hp\Documents\24k-0530 pflab5>

## SECTION 2; Q2)

File Edit View

```
#include <stdio.h>

int main() {
    int age;
    char citizenship;

    printf("Enter your age: ");
    scanf("%d", &age);

    printf("Are you a citizen? (y for yes/n for no): ");
    scanf(" %c", &citizenship);

    if (age >= 18 && citizenship == 'y') {
        printf("You are eligible to vote.");
    } else {
        printf("You are not eligible to vote.");
    }

    return 0;
}
```

```
C:\Windows\System32\cmd.e  ×  +  ▾
Microsoft Windows [Version 10.0.22631.4169]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Hp\Documents\24k-0530 pflab5>gcc s2q2.c -o s2q2.exe

C:\Users\Hp\Documents\24k-0530 pflab5>s2q2.exe
Enter your age: 21
Are you a citizen? (y for yes/n for no): y
You are eligible to vote.
C:\Users\Hp\Documents\24k-0530 pflab5>s2q2.exe
Enter your age: 23
Are you a citizen? (y for yes/n for no): n
You are not eligible to vote.
C:\Users\Hp\Documents\24k-0530 pflab5>s2q2.exe
Enter your age: 12
Are you a citizen? (y for yes/n for no): y
You are not eligible to vote.
C:\Users\Hp\Documents\24k-0530 pflab5>s2q2.exe
Enter your age: 11
Are you a citizen? (y for yes/n for no): n
You are not eligible to vote.
C:\Users\Hp\Documents\24k-0530 pflab5>
```

## SECTION 3; Q1)

File Edit View

```
#include <stdio.h>

int main() {
    int num1, num2;
    int max;

    printf("Enter first number: ");
    scanf("%d", &num1);

    printf("Enter second number: ");
    scanf("%d", &num2);

    max = (num1 > num2) ? num1 : num2;

    printf("Maximum number: %d", max);

    return 0;
}
```



C:\Windows\System32\cmd.e X



Microsoft Windows [Version 10.0.22631.4169]

(c) Microsoft Corporation. All rights reserved.

C:\Users\Hp\Documents\24k-0530 pflab5>gcc s3q1.c -o s3q1.exe

C:\Users\Hp\Documents\24k-0530 pflab5>s3q1.exe

Enter first number: 10

Enter second number: 2

Maximum number: 10

C:\Users\Hp\Documents\24k-0530 pflab5>|

## SECTION 3; Q2)

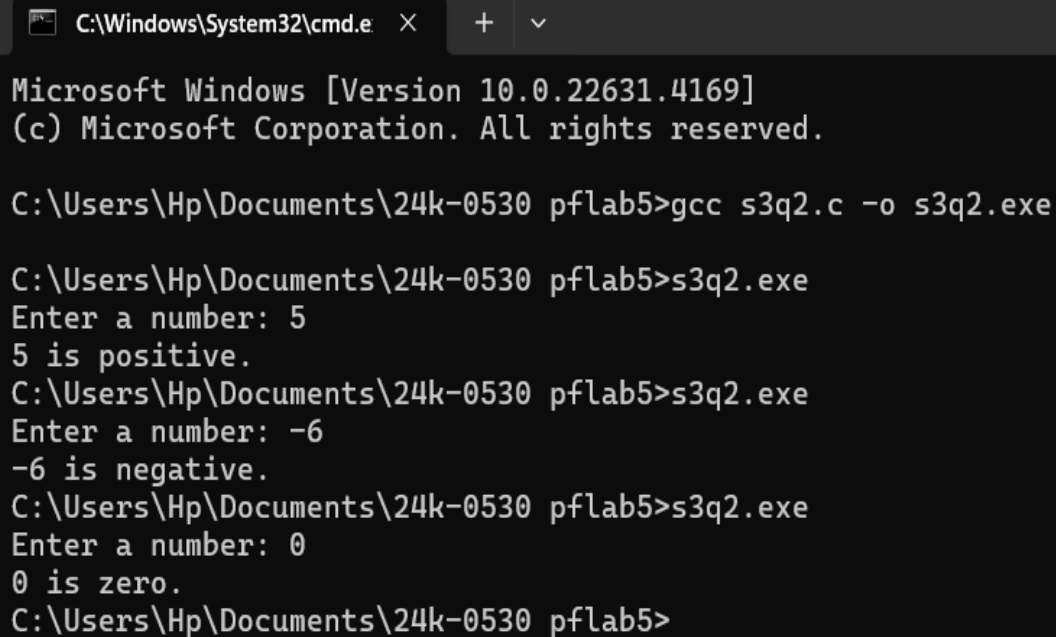
File Edit View

```
#include <stdio.h>

int main() {
    int num;

    printf("Enter a number: ");
    scanf("%d", &num);
    (num > 0) ? printf("%d is positive.", num) :
    (num < 0) ? printf("%d is negative.", num) :
    printf("%d is zero.", num);

    return 0;
}
```



C:\Windows\System32\cmd.e X + v

Microsoft Windows [Version 10.0.22631.4169]  
(c) Microsoft Corporation. All rights reserved.

C:\Users\Hp\Documents\24k-0530 pflab5>gcc s3q2.c -o s3q2.exe

C:\Users\Hp\Documents\24k-0530 pflab5>s3q2.exe  
Enter a number: 5  
5 is positive.

C:\Users\Hp\Documents\24k-0530 pflab5>s3q2.exe  
Enter a number: -6  
-6 is negative.

C:\Users\Hp\Documents\24k-0530 pflab5>s3q2.exe  
Enter a number: 0  
0 is zero.

C:\Users\Hp\Documents\24k-0530 pflab5>

## SECTION 4; Q1)

File Edit View

```
#include <stdio.h>

int main() {
    int num1, num2;

    printf("Enter first number: ");
    scanf("%d", &num1);

    printf("Enter second number: ");
    scanf("%d", &num2);

    printf("Before swapping:\n");
    printf("num1 = %d, num2 = %d\n", num1, num2);

    num1 = num1 ^ num2;
    num2 = num1 ^ num2;
    num1 = num1 ^ num2;

    printf("After swapping:\n");
    printf("num1 = %d, num2 = %d\n", num1, num2);

    return 0;
}
```

C:\Windows\System32\cmd.e X + v

Microsoft Windows [Version 10.0.22631.4169]  
(c) Microsoft Corporation. All rights reserved.

C:\Users\Hp\Documents\24k-0530 pflab5>gcc s4q1.c -o s4q1.exe

C:\Users\Hp\Documents\24k-0530 pflab5>s4q1.exe

Enter first number: 5

Enter second number: 9

Before swapping:

num1 = 5, num2 = 9

After swapping:

num1 = 9, num2 = 5

C:\Users\Hp\Documents\24k-0530 pflab5>|



## SECTION 5; Q1)

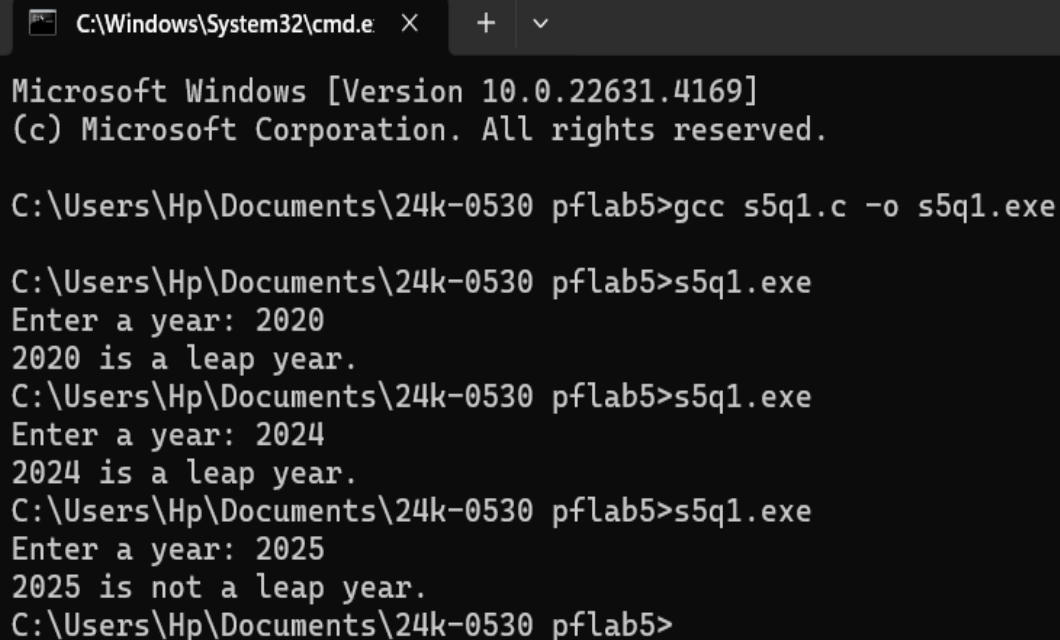
```
#include <stdio.h>

int main() {
    int year;

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

    if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
        printf("%d is a leap year.", year);
    } else {
        printf("%d is not a leap year.", year);
    }

    return 0;
}
```



The screenshot shows a Windows command prompt window with the title bar "C:\Windows\System32\cmd.e". The window displays the following text:

```
Microsoft Windows [Version 10.0.22631.4169]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Hp\Documents\24k-0530 pflab5>gcc s5q1.c -o s5q1.exe

C:\Users\Hp\Documents\24k-0530 pflab5>s5q1.exe
Enter a year: 2020
2020 is a leap year.
C:\Users\Hp\Documents\24k-0530 pflab5>s5q1.exe
Enter a year: 2024
2024 is a leap year.
C:\Users\Hp\Documents\24k-0530 pflab5>s5q1.exe
Enter a year: 2025
2025 is not a leap year.
C:\Users\Hp\Documents\24k-0530 pflab5>
```

## MORE PROBLEMS; Q1)

```
#include <stdio.h>

int main() {
    int num1, num2, num3;

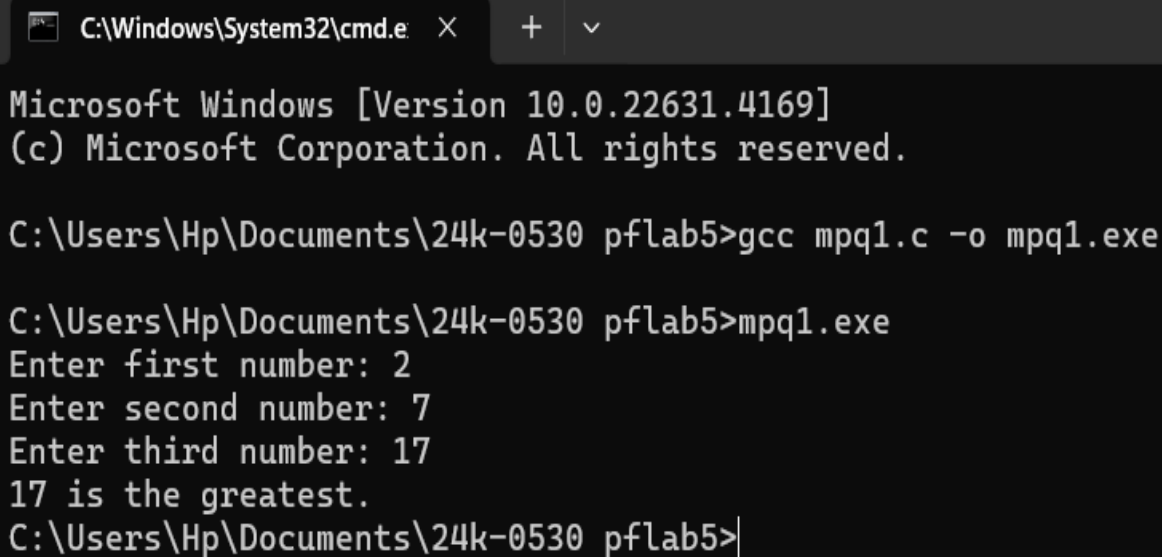
    printf("Enter first number: ");
    scanf("%d", &num1);

    printf("Enter second number: ");
    scanf("%d", &num2);

    printf("Enter third number: ");
    scanf("%d", &num3);

    if (num1 >= num2) {
        if (num1 >= num3) {
            printf("%d is the greatest.", num1);
        } else {
            printf("%d is the greatest.", num3);
        }
    } else {
        if (num2 >= num3) {
            printf("%d is the greatest.", num2);
        } else {
            printf("%d is the greatest.", num3);
        }
    }

    return 0;
}
```



The screenshot shows a Windows command prompt window with the title bar "C:\Windows\System32\cmd.e". The window displays the following text:

```
Microsoft Windows [Version 10.0.22631.4169]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Hp\Documents\24k-0530 pflab5>gcc mpq1.c -o mpq1.exe

C:\Users\Hp\Documents\24k-0530 pflab5>mpq1.exe
Enter first number: 2
Enter second number: 7
Enter third number: 17
17 is the greatest.
C:\Users\Hp\Documents\24k-0530 pflab5>
```

## MORE PROBLEMS; Q2)

```
#include <stdio.h>
int main() {

    float ATTENDANCE_WEIGHT = 0.2;
    float ASSIGNMENT_WEIGHT = 0.3;
    float EXAM_WEIGHT = 0.5;
    float attendancePercent, assignmentAverage, examScore, attendanceScore, assignmentScore, examScoreWeighted, finalGrade;
    char letterGrade;

    printf("Enter attendance percentage (0-100): ");
    scanf("%f", &attendancePercent);

    printf("Enter assignment average (0-100): ");
    scanf("%f", &assignmentAverage);

    printf("Enter exam score (0-100): ");
    scanf("%f", &examScore);

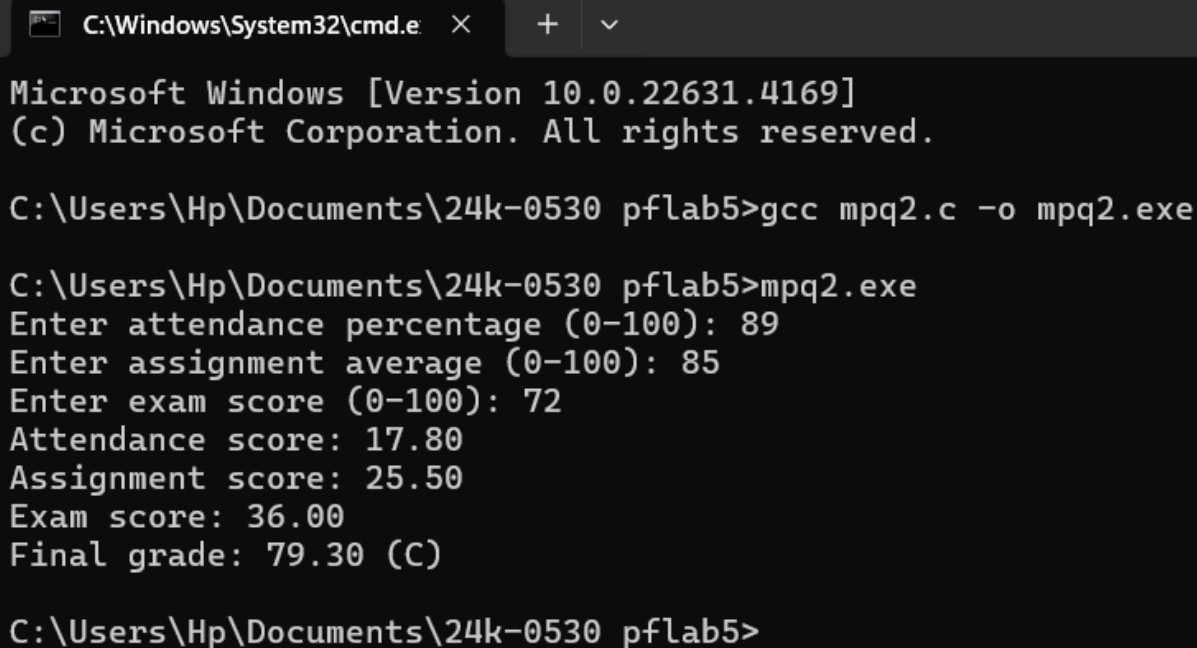
    attendanceScore = attendancePercent * ATTENDANCE_WEIGHT;
    assignmentScore = assignmentAverage * ASSIGNMENT_WEIGHT;
    examScoreWeighted = examScore * EXAM_WEIGHT;

    finalGrade = attendanceScore + assignmentScore + examScoreWeighted;

    if (finalGrade >= 90) {
        letterGrade = 'A';
    } else if (finalGrade >= 80) {
        letterGrade = 'B';
    } else if (finalGrade >= 70) {
        letterGrade = 'C';
    } else if (finalGrade >= 60) {
        letterGrade = 'D';
    } else {
        letterGrade = 'F';
    }

    printf("Attendance score: %.2f\n", attendanceScore);
    printf("Assignment score: %.2f\n", assignmentScore);
    printf("Exam score: %.2f\n", examScoreWeighted);
    printf("Final grade: %.2f (C)\n", finalGrade, letterGrade);

    return 0;
}
```



The screenshot shows a Windows command prompt window with the title bar "C:\Windows\System32\cmd.e". The window displays the following text:

```
Microsoft Windows [Version 10.0.22631.4169]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Hp\Documents\24k-0530 pflab5>gcc mpq2.c -o mpq2.exe

C:\Users\Hp\Documents\24k-0530 pflab5>mpq2.exe
Enter attendance percentage (0-100): 89
Enter assignment average (0-100): 85
Enter exam score (0-100): 72
Attendance score: 17.80
Assignment score: 25.50
Exam score: 36.00
Final grade: 79.30 (C)

C:\Users\Hp\Documents\24k-0530 pflab5>
```

## MORE PROBLEMS; Q3)

File Edit View

```
#include <stdio.h>

char encrypt(char plainText) {
    return plainText ^ 8;
}

char decrypt(char cipherText) {
    return cipherText ^ 8;
}

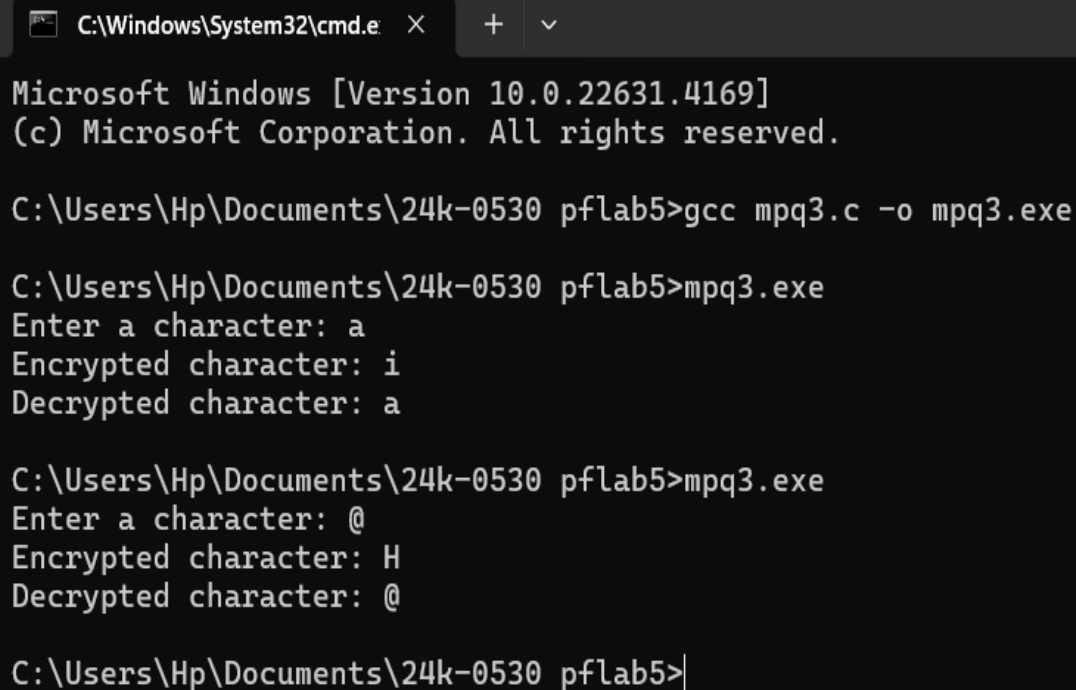
int main() {
    char plainText;

    printf("Enter a character: ");
    scanf(" %c", &plainText);

    char cipherText = encrypt(plainText);
    printf("Encrypted character: %c\n", cipherText);

    char decryptedText = decrypt(cipherText);
    printf("Decrypted character: %c\n", decryptedText);

    return 0;
}
```



The screenshot shows a Windows command prompt window with the title bar "C:\Windows\System32\cmd.e". The window displays the following text:

```
Microsoft Windows [Version 10.0.22631.4169]
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C:\Users\Hp\Documents\24k-0530 pflab5>gcc mpq3.c -o mpq3.exe

C:\Users\Hp\Documents\24k-0530 pflab5>mpq3.exe
Enter a character: a
Encrypted character: i
Decrypted character: a

C:\Users\Hp\Documents\24k-0530 pflab5>mpq3.exe
Enter a character: @
Encrypted character: H
Decrypted character: @

C:\Users\Hp\Documents\24k-0530 pflab5>
```

## MORE PROBLEMS; Q4

```
#include <stdio.h>

int main() {
    int age;
    float income;
    int creditScore;

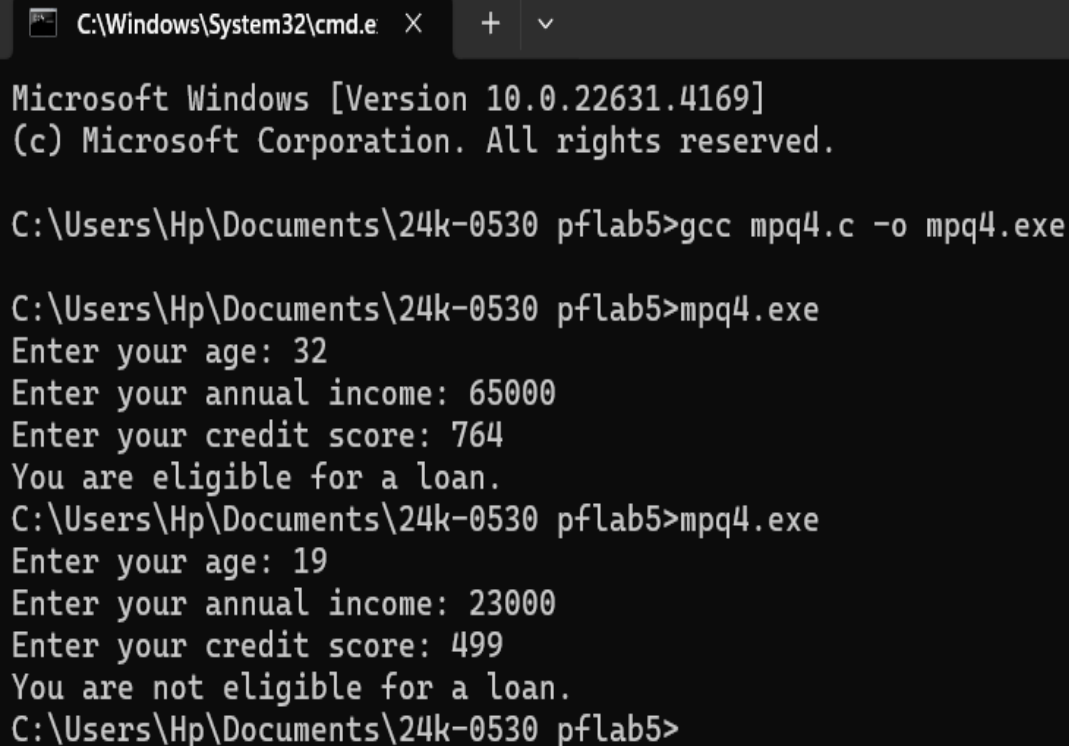
    printf("Enter your age: ");
    scanf("%d", &age);

    printf("Enter your annual income: ");
    scanf("%f", &income);

    printf("Enter your credit score: ");
    scanf("%d", &creditScore);

    if (age >= 25 && age <= 60 && income >= 50000 && creditScore >= 500) {
        printf("You are eligible for a loan.");
    }
    else {
        printf("You are not eligible for a loan.");
    }

    return 0;
}
```



The screenshot shows a Windows command prompt window with the title bar "C:\Windows\System32\cmd.e". The window content displays the following text:

```
Microsoft Windows [Version 10.0.22631.4169]
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C:\Users\Hp\Documents\24k-0530 pflab5>gcc mpq4.c -o mpq4.exe

C:\Users\Hp\Documents\24k-0530 pflab5>mpq4.exe
Enter your age: 32
Enter your annual income: 65000
Enter your credit score: 764
You are eligible for a loan.
C:\Users\Hp\Documents\24k-0530 pflab5>mpq4.exe
Enter your age: 19
Enter your annual income: 23000
Enter your credit score: 499
You are not eligible for a loan.
C:\Users\Hp\Documents\24k-0530 pflab5>
```