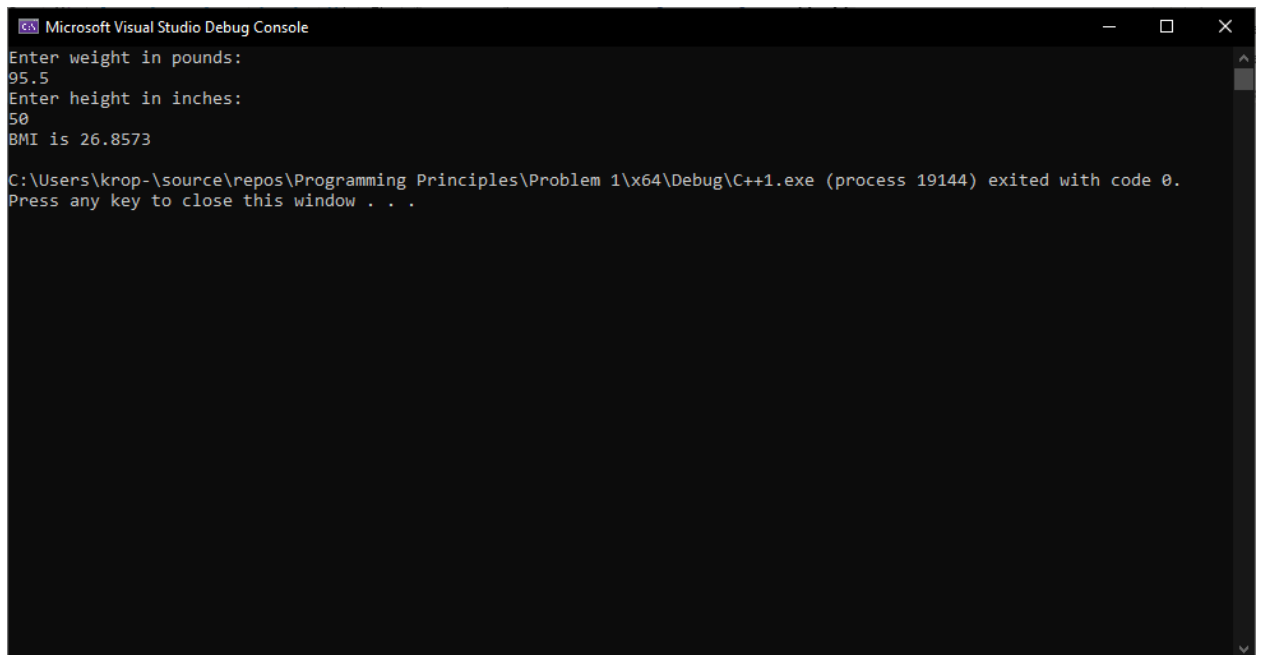Conventional Course Fall 2021

COMP-111 (Section 04) Programming Principles I

Programming Assignment 1

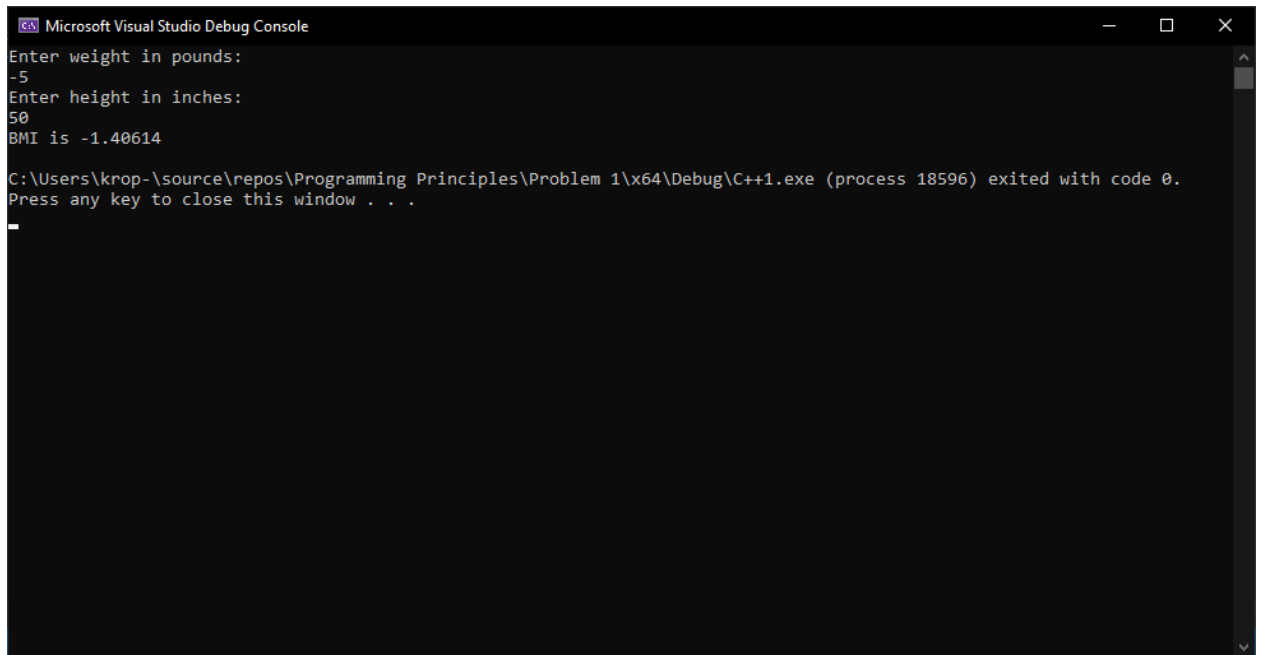Made by Ivan Kosiakov (U214N1534)

Problems

Problem 1.

Body Mass Index (BMI) is a measure of health on weight. It can be calculated by taking your weight in kilograms and dividing by the square of your height in meters. Write a program than prompts the user to enter a weight in pounds and height in inches and display the BMI. Note that 1 pound is 0.45359237 kilogram and 1 inch is 0.0254 meter. Here is a sample run:

```
Enter weight in pounds: 95.5
Enter height in inches: 50
BMI is 26.8573
```

```
Microsoft Visual Studio Debug Console                                    —   □   ×
Enter weight in pounds:
95.5
Enter height in inches:
50
BMI is 26.8573

C:\Users\krop-\source\repos\Programming Principles\Problem 1\x64\Debug\C++1.exe (process 19144) exited with code 0.
Press any key to close this window . . .
```
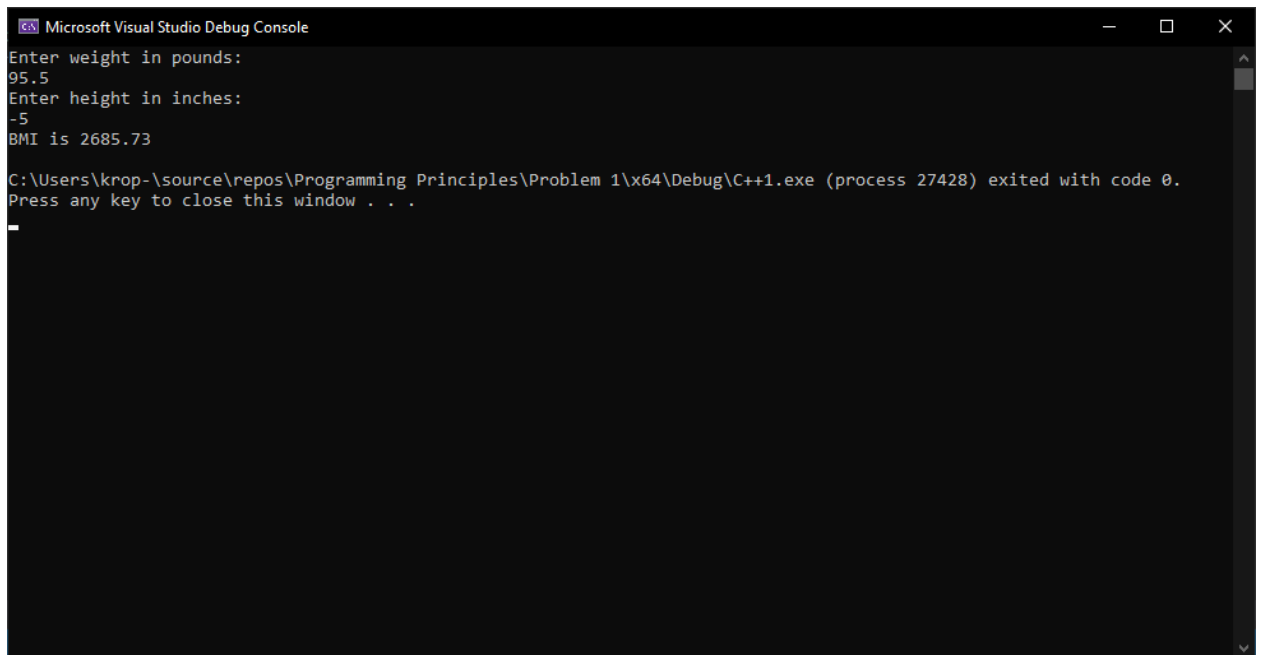
Pic. 1. Code compiled successfully;

Pic. 2. Code error if weight ≤ 0;

Pic. 3. Code error if height ≤ 0;

Problem 2.

Write a program that prompts the user to enter two points (x1,y1) and (x2,y2) and display their distance. The formula for computing the distance is shown below: x_2
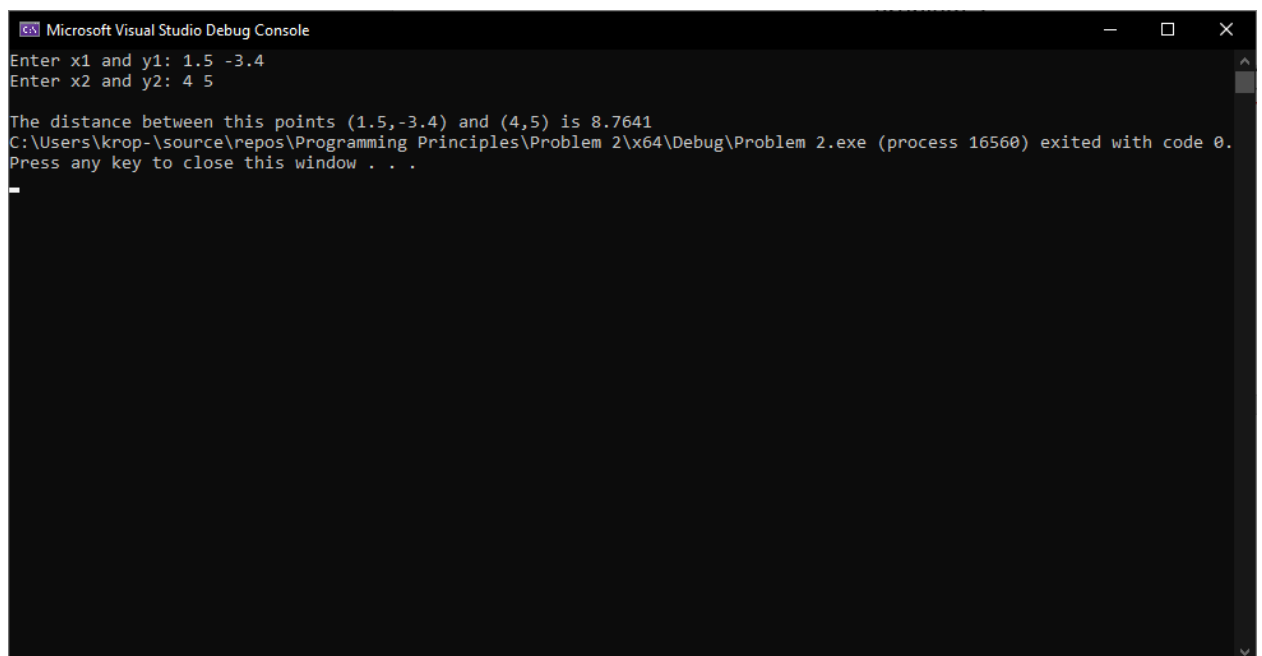
THE DISTANCE FORMULA

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Here is a sample run:

Enter x1 and y1: *1.5 -3.4*
Enter x2 and y2: *4 5*
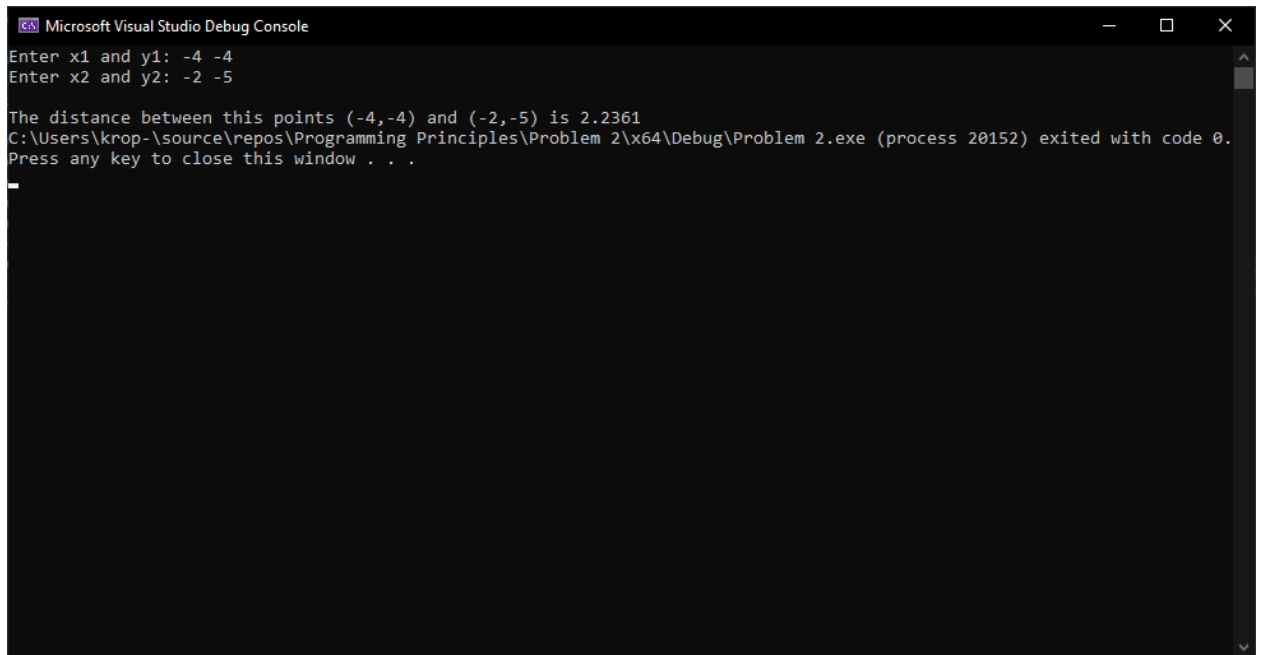
The distance between the points (1.5,-3.4) and (4,5) is 8.7641

```
Microsoft Visual Studio Debug Console                                             —    □    ✕
Enter x1 and y1: 1.5 -3.4
Enter x2 and y2: 4 5

The distance between this points (1.5,-3.4) and (4,5) is 8.7641
C:\Users\krop-\source\repos\Programming Principles\Problem 2\x64\Debug\Problem 2.exe (process 16560) exited with code 0.
Press any key to close this window . . .
```

Pic. 4. Code compiled successfully;

```
Microsoft Visual Studio Debug Console                                                    —    □    ✕
Enter x1 and y1: -4 -4
Enter x2 and y2: -2 -5

The distance between this points (-4,-4) and (-2,-5) is 2.2361
C:\Users\krop-\source\repos\Programming Principles\Problem 2\x64\Debug\Problem 2.exe (process 20152) exited with code 0.
Press any key to close this window . . .
```
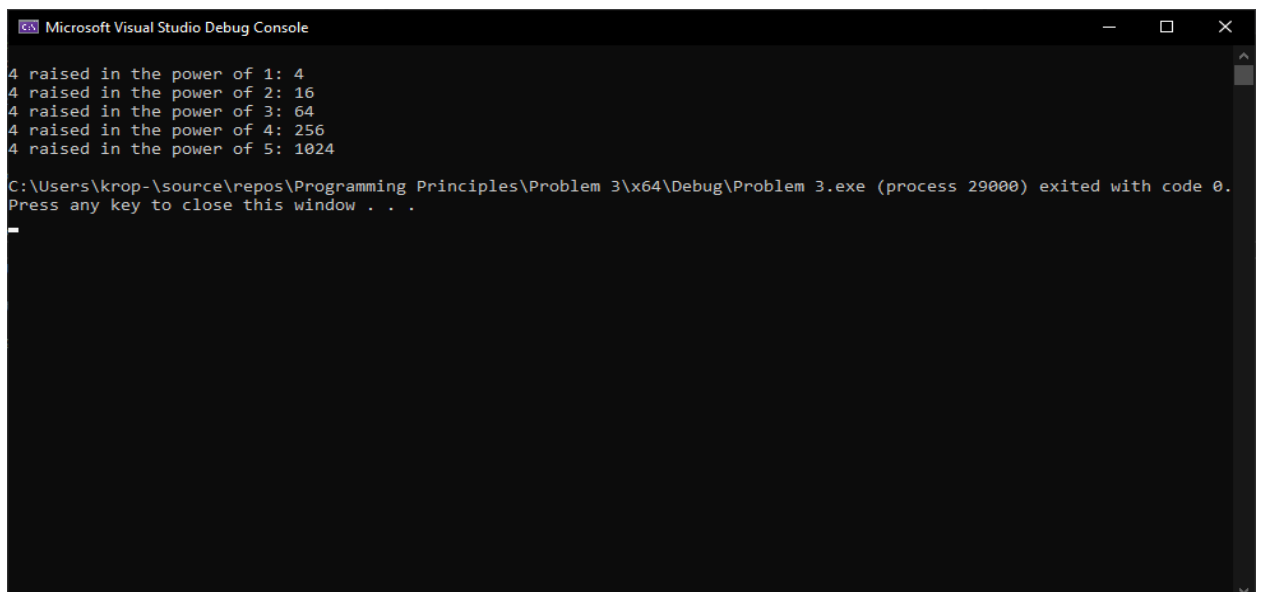
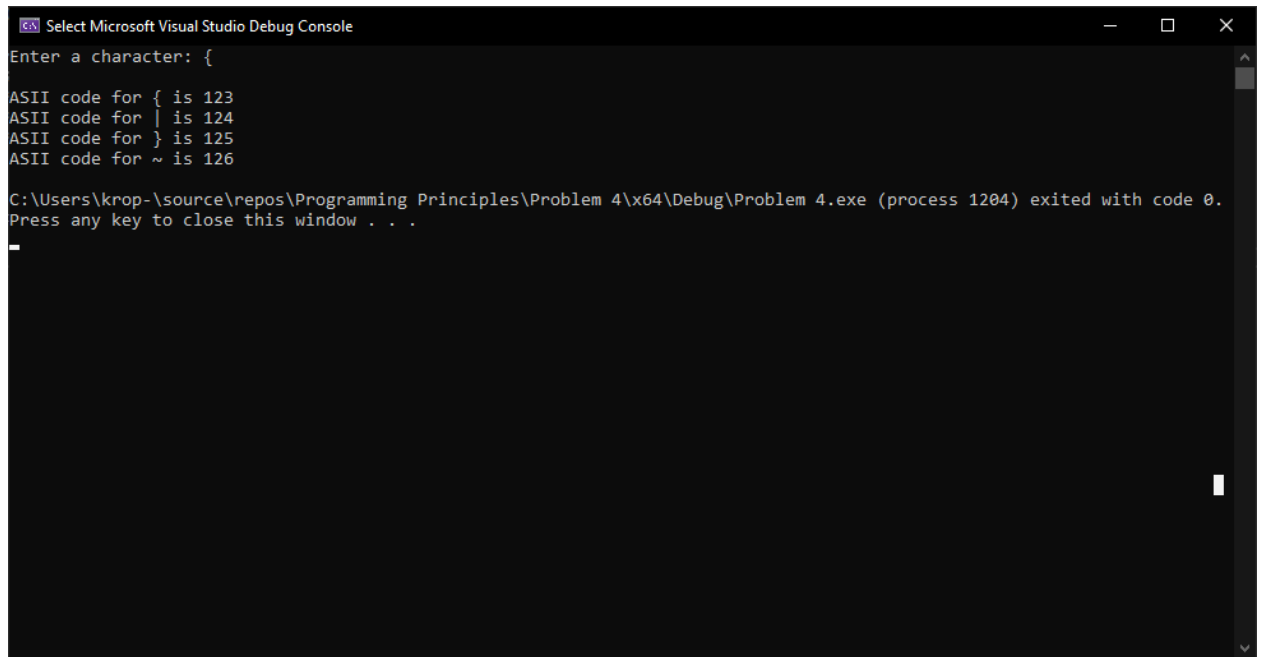Pic. 5. Code compiled successfully even with numbers that are ≤ 0;

Problem 3.

Write a program that prompts the user to enter a number n and displays n^1, n^2, n^3, n^4, n^5. Here is a sample run:

```
Enter a number: 4

4 raised in the power of 1:        4
4 raised in the power of 2:       16
4 raised in the power of 3:       64
4 raised in the power of 4:      256
4 raised in the power of 5:     1024
```

```
Microsoft Visual Studio Debug Console                                                    —    □    ✕
4 raised in the power of 1: 4
4 raised in the power of 2: 16
4 raised in the power of 3: 64
4 raised in the power of 4: 256
4 raised in the power of 5: 1024

C:\Users\krop-\source\repos\Programming Principles\Problem 3\x64\Debug\Problem 3.exe (process 29000) exited with code 0.
Press any key to close this window . . .
```

Pic. 6. Code compiled successfully;

```
Microsoft Visual Studio Debug Console                               —    □    ✕
Enter a number: -5

-5 raised in the power of 1: -5
-5 raised in the power of 2: 25
-5 raised in the power of 3: -125
-5 raised in the power of 4: 625
-5 raised in the power of 5: -3125

C:\Users\krop-\source\repos\Programming Principles\Problem 3\x64\Debug\Problem 3.exe (process 22068) exited with code 0.
Press any key to close this window . . .
```
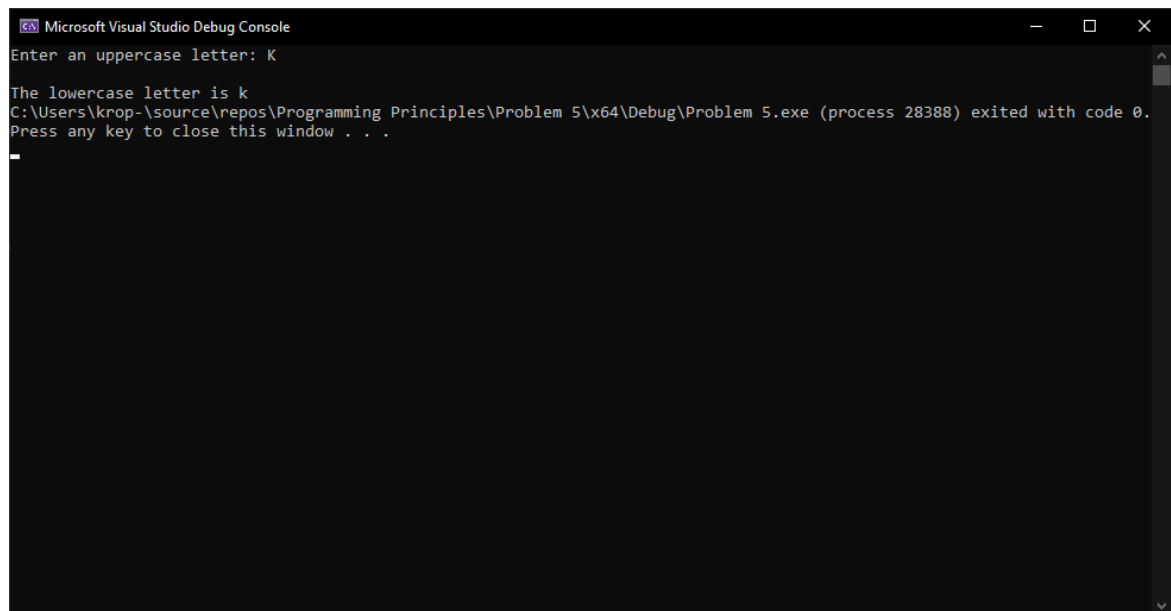
Pic.7. Code compiled successfully even with numbers that are ≤ 0;

Problem 4.

Write a program that prompts the user for a character and displays its ASCII code as well as the ASCII codes for the next 3 characters. Here is a sample run:

```
Enter a character: A

ASCII code for A is 65
ASCII code for B is 66
ASCII code for C is 67
ASCII code for D is 68
```

```
Microsoft Visual Studio Debug Console                               —    □    ✕
Enter a character: A

ASII code for A is 65
ASII code for B is 66
ASII code for C is 67
ASII code for D is 68

C:\Users\krop-\source\repos\Programming Principles\Problem 4\x64\Debug\Problem 4.exe (process 26868) exited with code 0.
Press any key to close this window . . .
```

Pic. 6. Code compiled successfully;

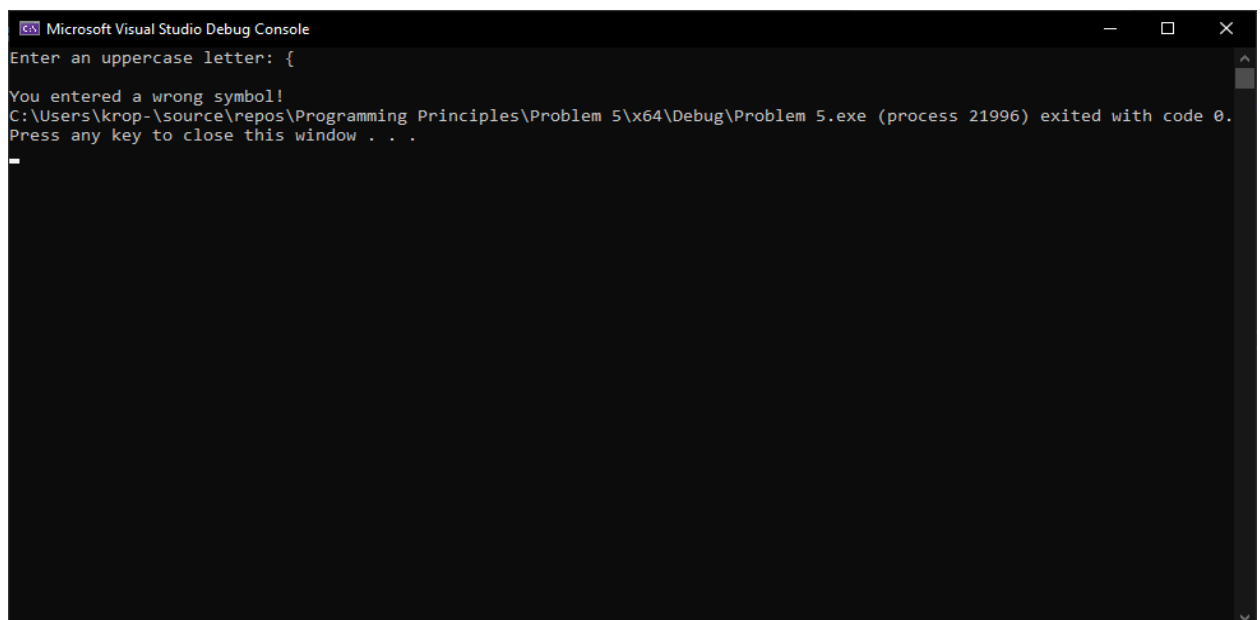Pic.7. Code compiled successfully with other example;

Problem 5.

Write a program that prompts the user to enter an uppercase letter and converts it to a lowercase letter. Hint: In the ASCII table the uppercase letters appear before the lowercase letters. The offset between any uppercase letter and its corresponding lowercase letter is the same. Here is a sample run:

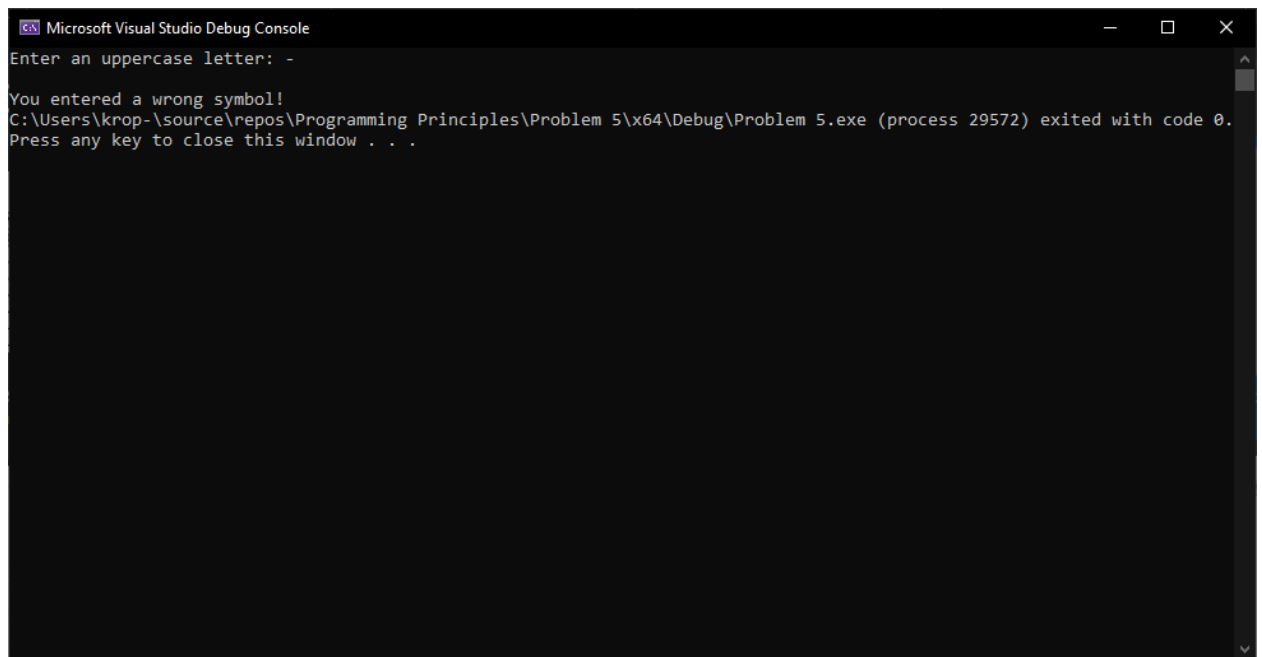Enter an uppercase letter: *K*
The lowercase letter is k

Pic. 8. Code compiled successfully;

Pic. 9. Code error if symbol ASCII code > 90;

Pic. 10. Code error if symbol ASCII code < 65;