

# Conventional Course Fall 2021

## COMP-111 (Section 04) Programming Principles I

### Programming Assignment 2

*Made by Ivan Kosiakov ( U214N1534 )*

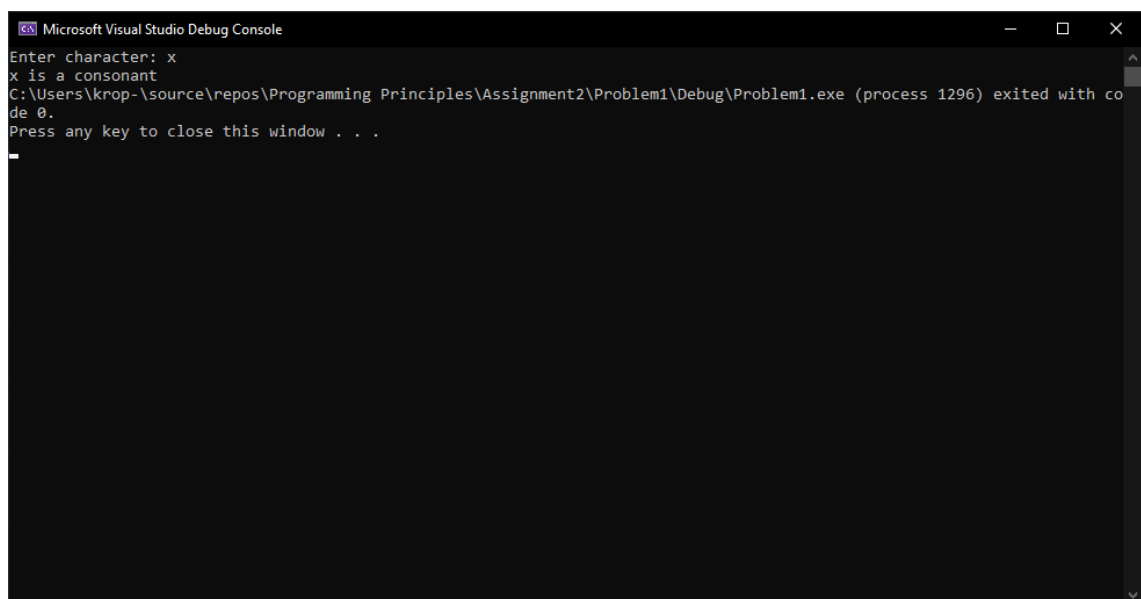
## Problems

### Problem 1

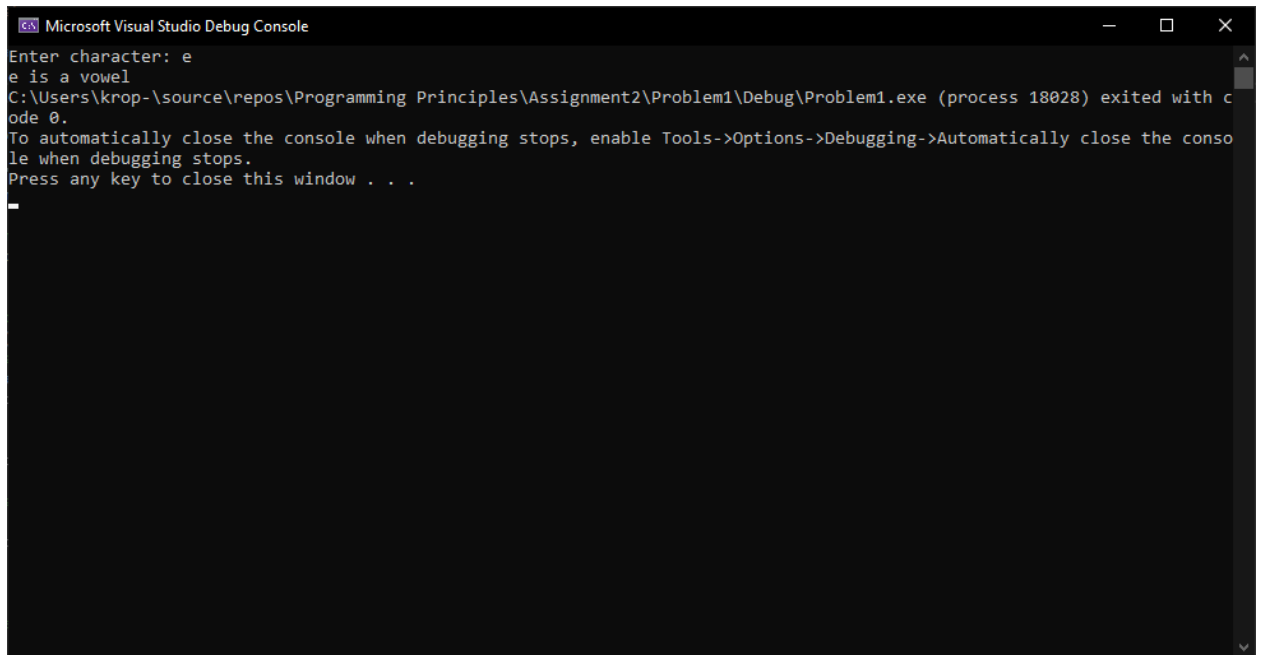
Words are built from vowels (a,e,i,o,u) and consonants (the rest letters except y). The letter y sometimes acts as a consonant and sometimes it acts as a vowel. Write a program that reads a character and returns whether or not is a vowel or consonant. If the user enters a nonalphabetic character, the program will display an error message.

Here is a sample run:

```
Enter character: x
x is a consonant
```

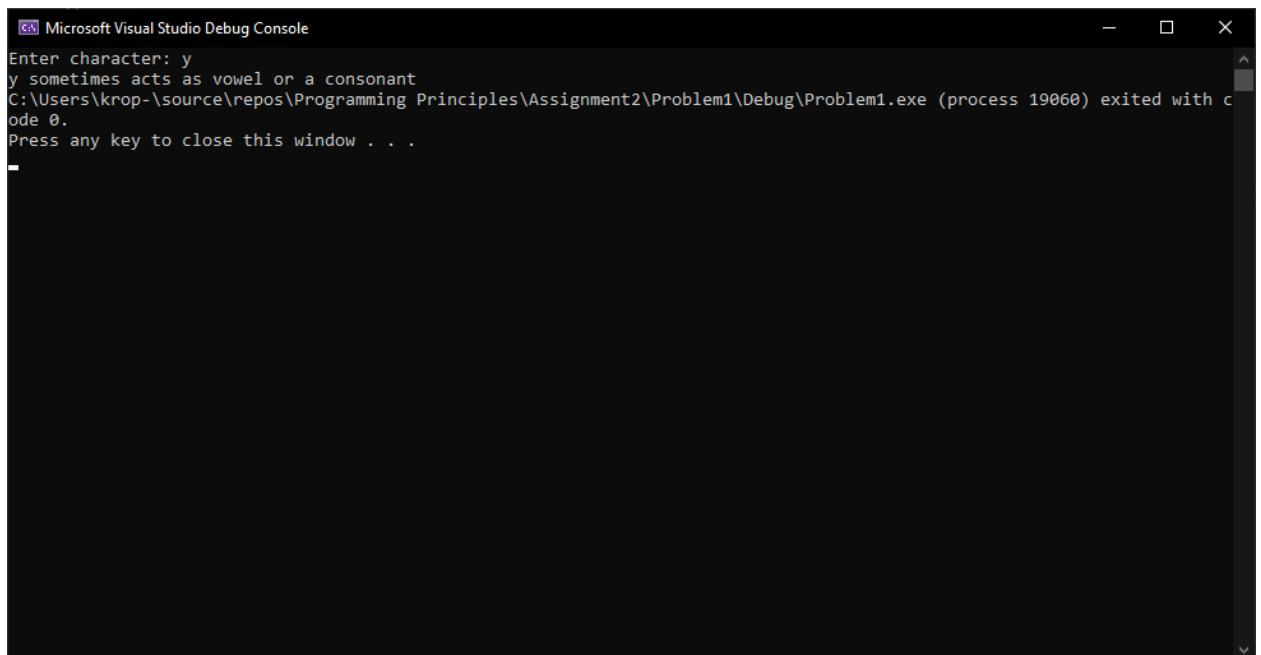


Pic. 1. Try to enter a constant. Code compiled successfully.



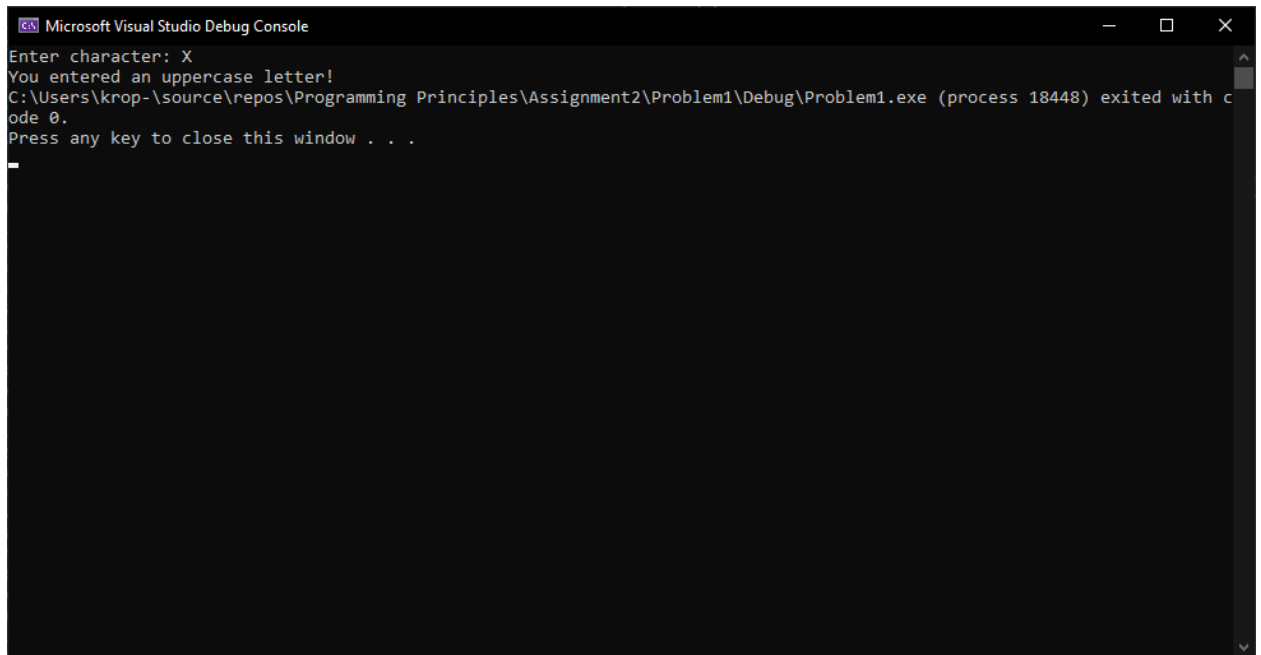
```
Microsoft Visual Studio Debug Console
Enter character: e
e is a vowel
C:\Users\krop-\source\repos\Programming Principles\Assignment2\Problem1\Debug\Problem1.exe (process 18028) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

Pic. 2. Try to enter a vowel. Code compiled successfully.



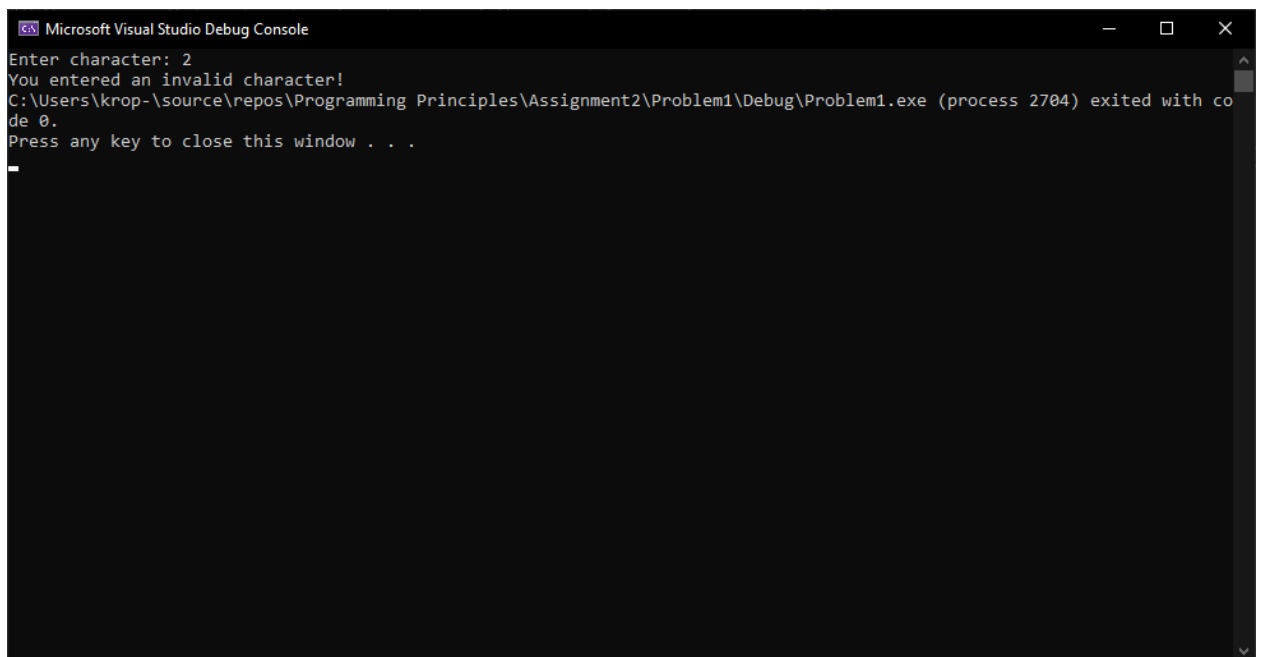
```
Microsoft Visual Studio Debug Console
Enter character: y
y sometimes acts as vowel or a consonant
C:\Users\krop-\source\repos\Programming Principles\Assignment2\Problem1\Debug\Problem1.exe (process 19060) exited with code 0.
Press any key to close this window . . .
```

Pic. 3. Try to enter an “y”. Code compiled successfully.



```
Microsoft Visual Studio Debug Console
Enter character: X
You entered an uppercase letter!
C:\Users\krop-\source\repos\Programming Principles\Assignment2\Problem1\Debug\Problem1.exe (process 18448) exited with code 0.
Press any key to close this window . . .
```

Pic. 4. Try to enter uppercase letter. Program shows an error.

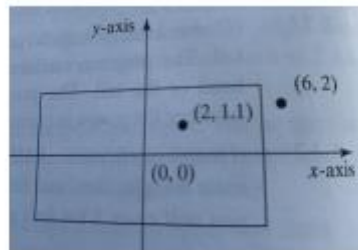


```
Microsoft Visual Studio Debug Console
Enter character: 2
You entered an invalid character!
C:\Users\krop-\source\repos\Programming Principles\Assignment2\Problem1\Debug\Problem1.exe (process 2704) exited with code 0.
Press any key to close this window . . .
```

Pic. 5. Try to enter number. Program shows an error.

## Problem 2

Write a program that prompts the user to enter the width  $w$  and height  $h$  of a rectangle, along with a point  $(x,y)$ . Your program is going to check if the point is within the rectangle centered at  $(0,0)$  with width  $w$  and height  $h$ . Hint: a point is in the rectangle if its horizontal distance to  $(0,0)$  is less or equal to  $w/2$  and its vertical distance to  $(0,0)$  is less or equal to  $h/2$ .



Here is a sample run:

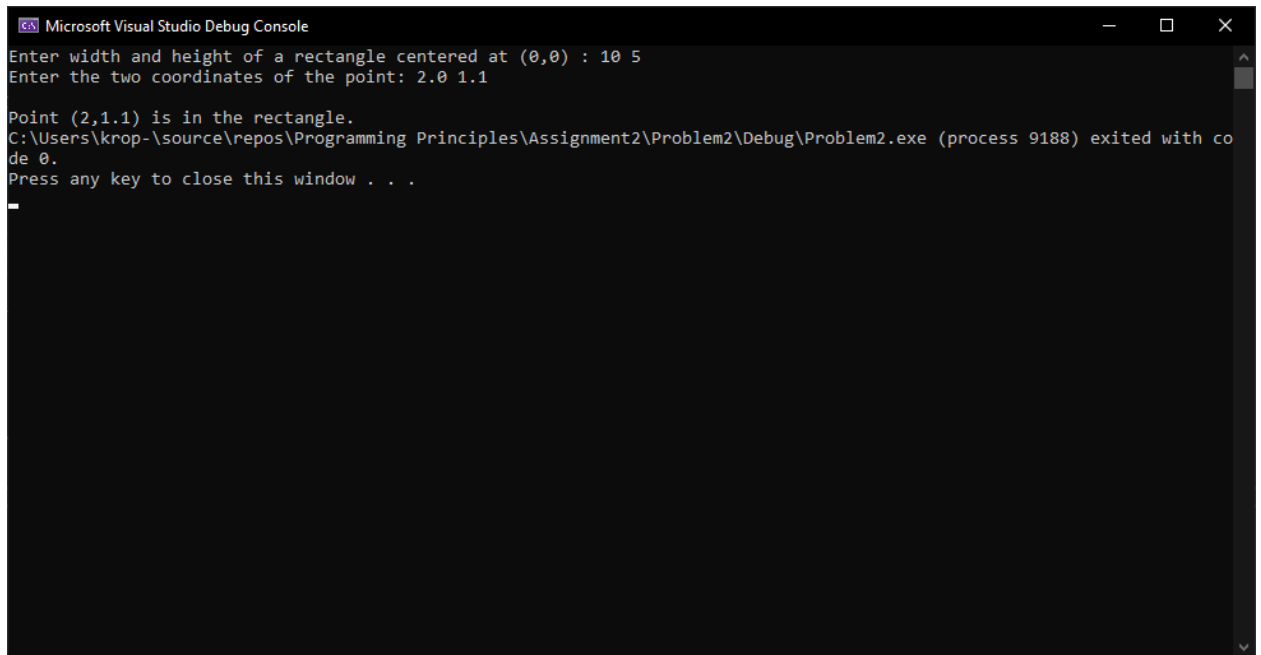
```
Enter width and height of a rectangle centered at (0,0) : 10 5
Enter the two coordinates of the point: 2.0 1.1

Point (2.0,1.1) is in the rectangle.
```

Here is another sample run:

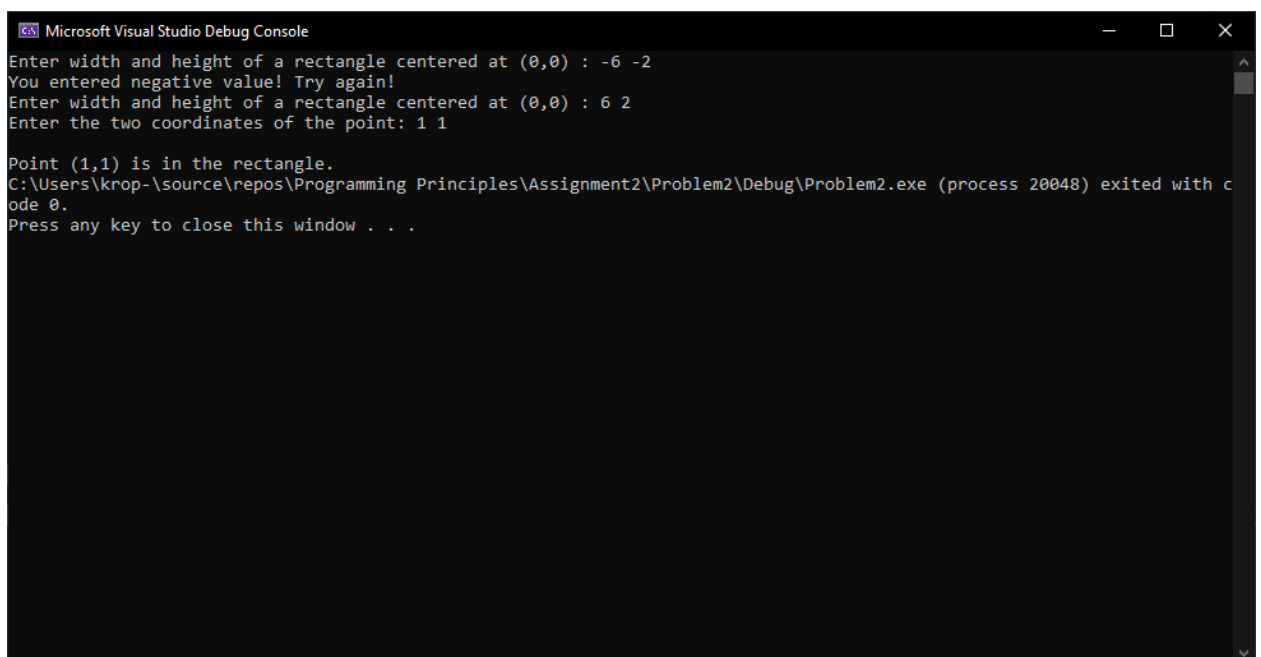
```
Enter width and height of a rectangle centered at (0,0): 10 5
Enter the two coordinates of the point: 6 2

Point (6,2) is not the rectangle.
```



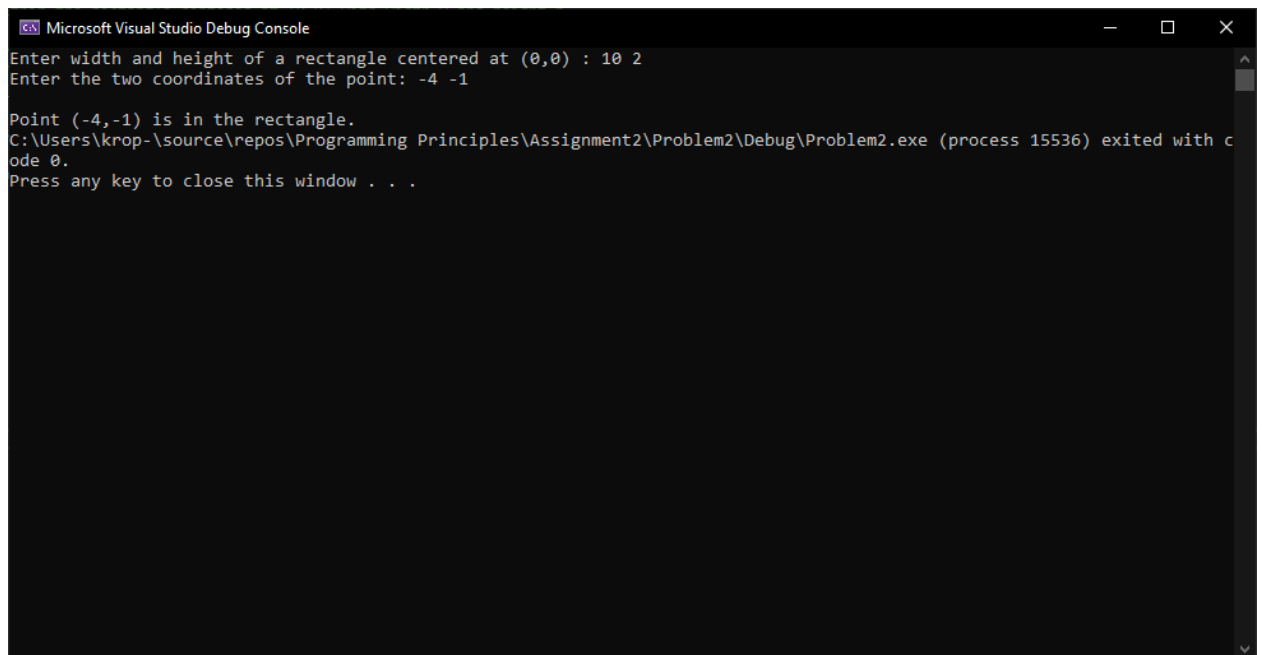
```
Microsoft Visual Studio Debug Console
Enter width and height of a rectangle centered at (0,0) : 10 5
Enter the two coordinates of the point: 2.0 1.1
Point (2,1.1) is in the rectangle.
C:\Users\krop-\source\repos\Programming Principles\Assignment2\Problem2\Debug\Problem2.exe (process 9188) exited with code 0.
Press any key to close this window . . .
```

Pic. 1. Try to enter integer numbers. Code compiled successfully.



```
Microsoft Visual Studio Debug Console
Enter width and height of a rectangle centered at (0,0) : -6 -2
You entered negative value! Try again!
Enter width and height of a rectangle centered at (0,0) : 6 2
Enter the two coordinates of the point: 1 1
Point (1,1) is in the rectangle.
C:\Users\krop-\source\repos\Programming Principles\Assignment2\Problem2\Debug\Problem2.exe (process 20048) exited with code 0.
Press any key to close this window . . .
```

Pic. 2. Try to enter negative values for rectangle. Program asks for re-entering a value. Code compiled successfully.



```
Microsoft Visual Studio Debug Console
Enter width and height of a rectangle centered at (0,0) : 10 2
Enter the two coordinates of the point: -4 -1
Point (-4,-1) is in the rectangle.
C:\Users\krop-\source\repos\Programming Principles\Assignment2\Problem2\Debug\Problem2.exe (process 15536) exited with code 0.
Press any key to close this window . . .
```

Pic. 3. Try to enter negative values for coordinates of point. Code compiled successfully.

### Problem 3

Write a program that prompts the user to enter three numbers and displays them in an ascending order and also in a descending order. Here is a sample run:

Enter 3 numbers: 4 -2 3

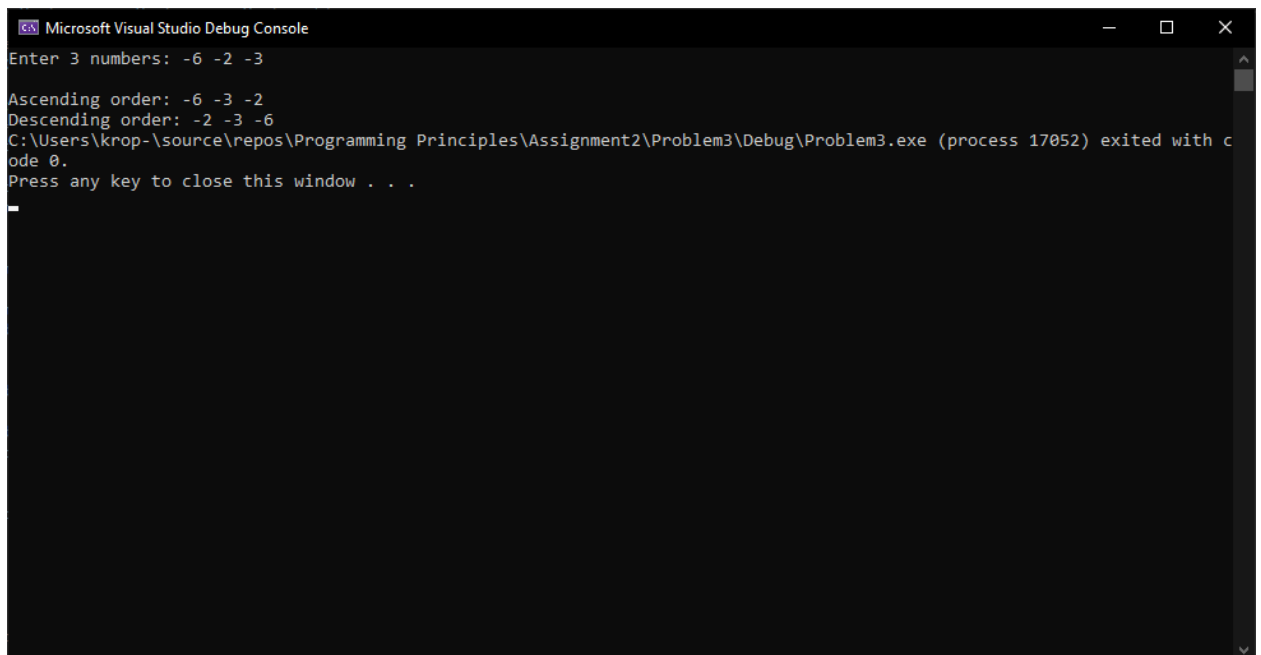
Ascending order: -2 3 4

Descending order: 4 3 -2



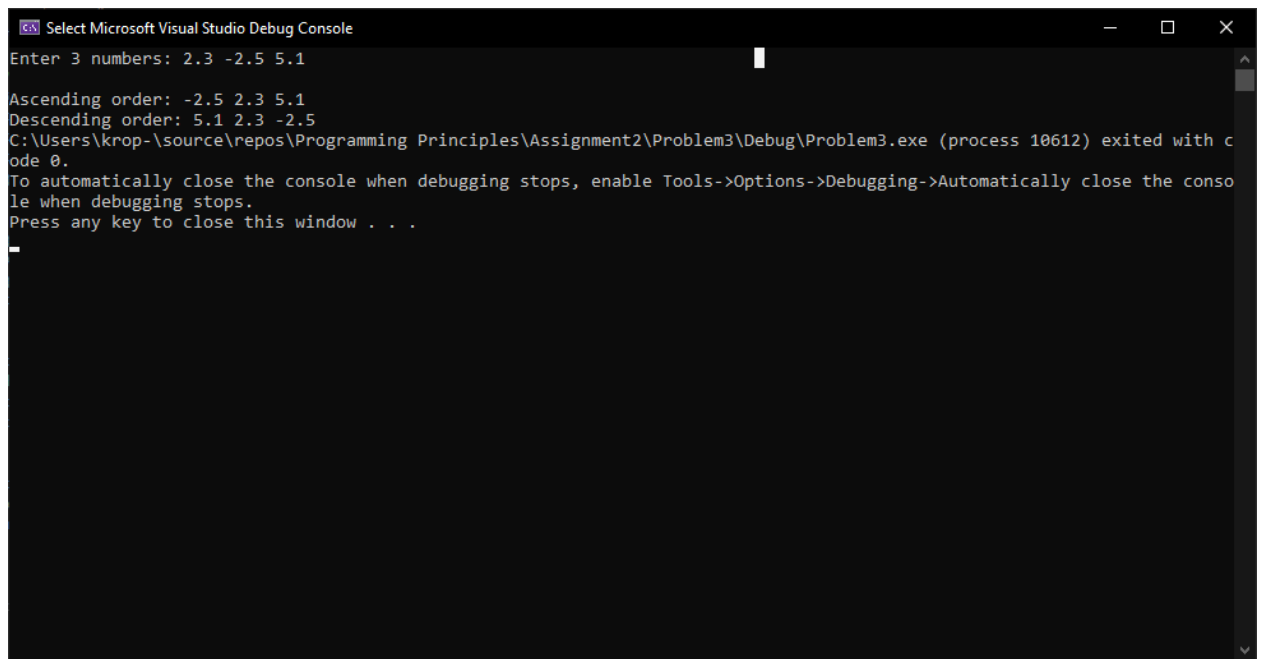
```
Select Microsoft Visual Studio Debug Console
Enter 3 numbers: 4 2 3
Ascending order: 2 3 4
Descending order: 4 3 2
C:\Users\krop-\source\repos\Programming Principles\Assignment2\Problem3\Debug\Problem3.exe (process 13844) exited with code 0.
Press any key to close this window . . .
```

Pic. 1. Try to enter integer numbers. Code compiled successfully.



```
Microsoft Visual Studio Debug Console
Enter 3 numbers: -6 -2 -3
Ascending order: -6 -3 -2
Descending order: -2 -3 -6
C:\Users\krop-\source\repos\Programming Principles\Assignment2\Problem3\Debug\Problem3.exe (process 17052) exited with code 0.
Press any key to close this window . . .
```

Pic. 2. Try to enter negative numbers. Code compiled successfully.

A screenshot of a Visual Studio Debug Console window. The title bar reads "Select Microsoft Visual Studio Debug Console". The console output shows: "Enter 3 numbers: 2.3 -2.5 5.1", "Ascending order: -2.5 2.3 5.1", "Descending order: 5.1 2.3 -2.5", and a message that the program exited successfully. It also includes instructions on how to automatically close the console when debugging stops.

```
Select Microsoft Visual Studio Debug Console
Enter 3 numbers: 2.3 -2.5 5.1
Ascending order: -2.5 2.3 5.1
Descending order: 5.1 2.3 -2.5
C:\Users\krop-\source\repos\Programming Principles\Assignment2\Problem3\Debug\Problem3.exe (process 10612) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

Pic. 3. Try to enter double numbers. Code compiled successfully.

## Problem 4

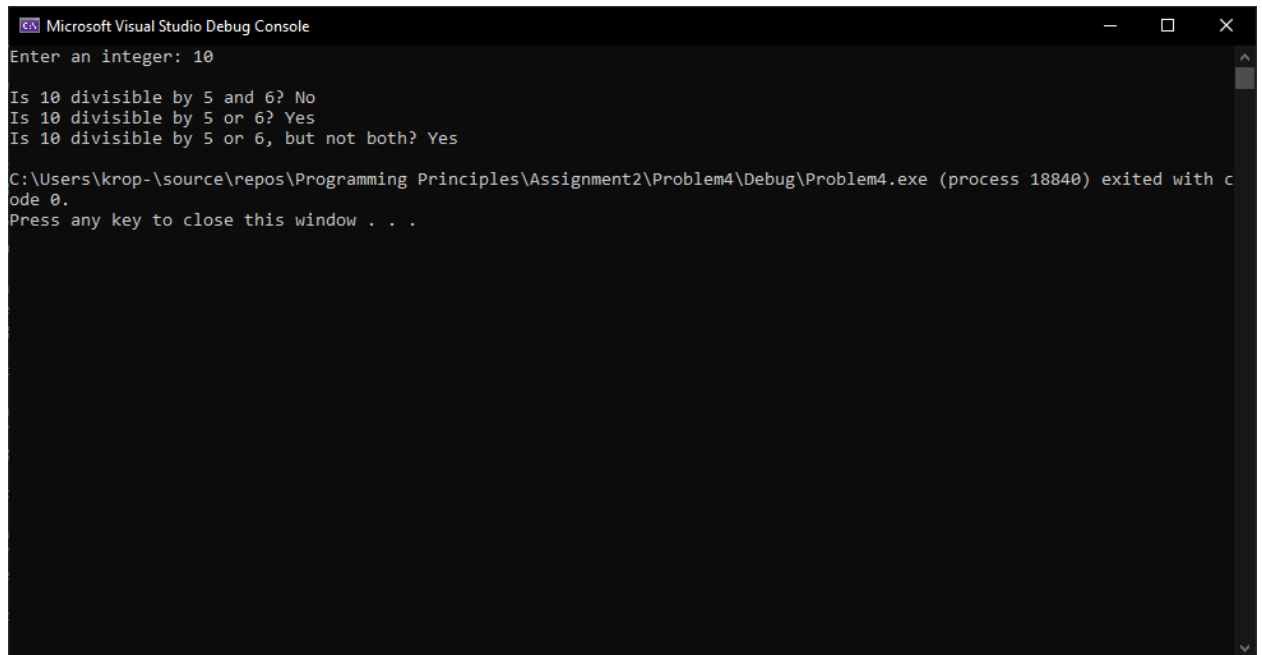
Write a program that prompts the user to enter an integer and determines whether or not it is divisible by 5 and 6, whether it is divisible by 5 or 6, and whether it is divisible by 5 or 6 but not both.

Here is a sample run:

```
Enter an integer: 10

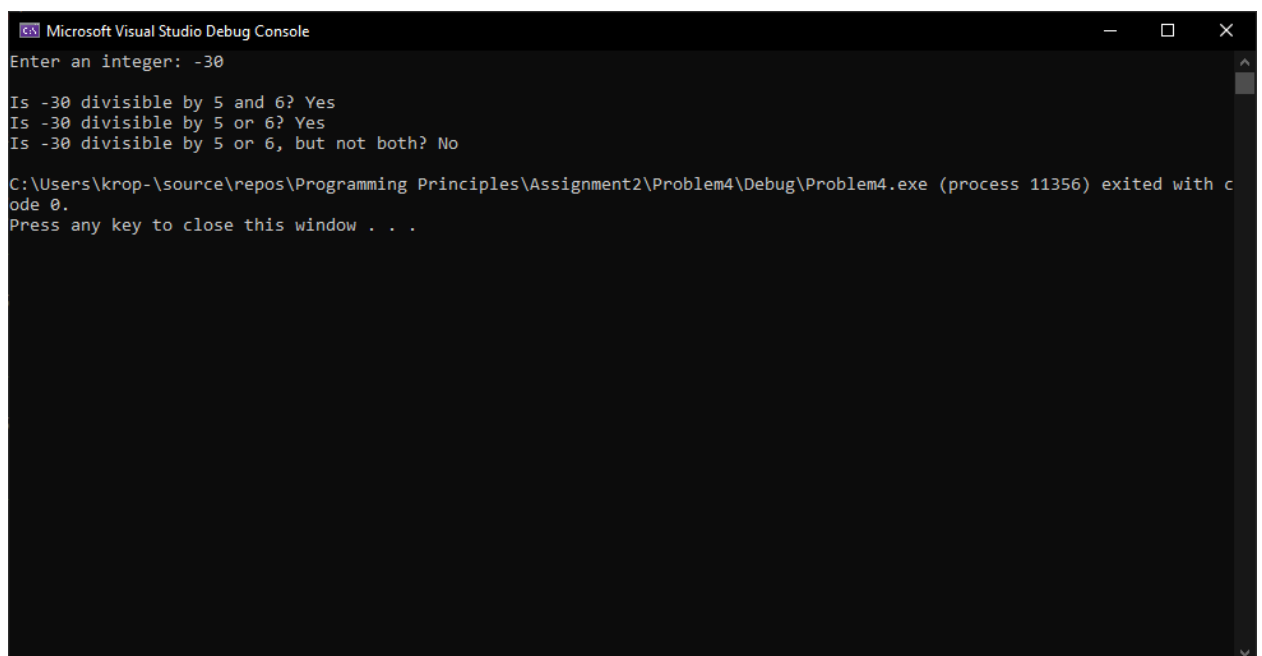
Is 10 divisible by 5 and 6? No
Is 10 divisible by 5 or 6? Yes
Is 10 divisible by 5 or 6, but not both? Yes
```





```
Microsoft Visual Studio Debug Console
Enter an integer: 10
Is 10 divisible by 5 and 6? No
Is 10 divisible by 5 or 6? Yes
Is 10 divisible by 5 or 6, but not both? Yes
C:\Users\krop-\source\repos\Programming Principles\Assignment2\Problem4\Debug\Problem4.exe (process 18840) exited with code 0.
Press any key to close this window . . .
```

Pic. 1. Try to enter integer number. Code compiled successfully.



```
Microsoft Visual Studio Debug Console
Enter an integer: -30
Is -30 divisible by 5 and 6? Yes
Is -30 divisible by 5 or 6? Yes
Is -30 divisible by 5 or 6, but not both? No
C:\Users\krop-\source\repos\Programming Principles\Assignment2\Problem4\Debug\Problem4.exe (process 11356) exited with code 0.
Press any key to close this window . . .
```

Pic. 2. Try to enter negative number. Code compiled successfully.

## Problem 5

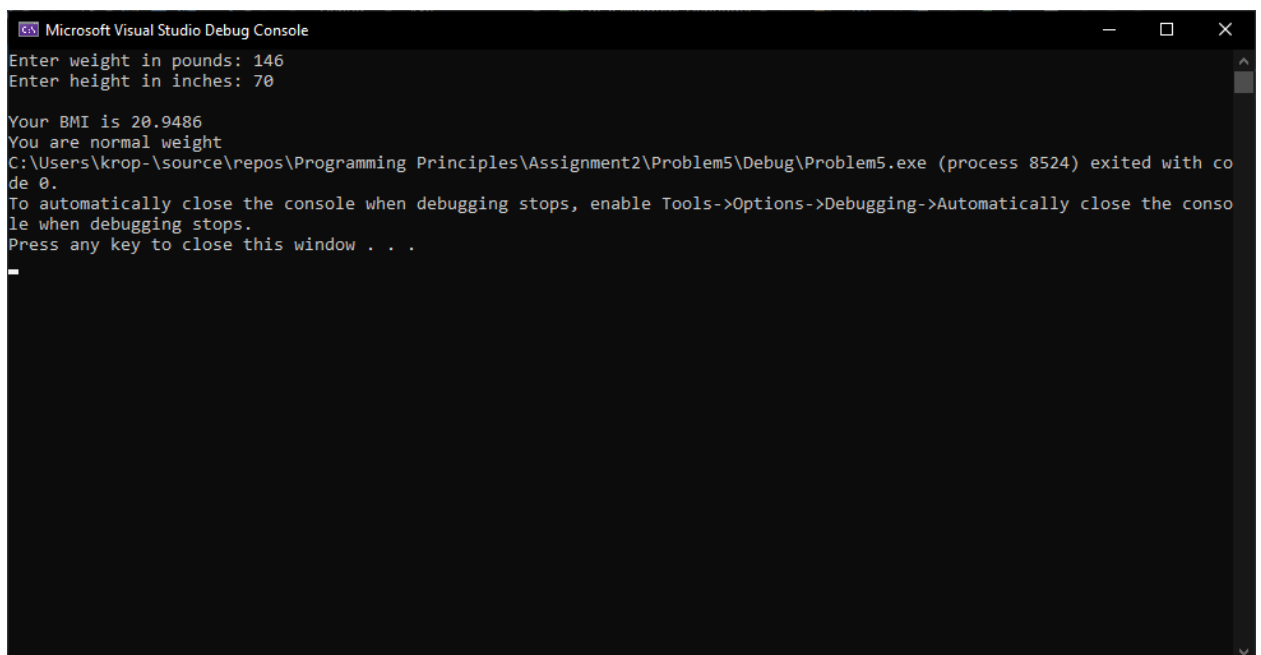
Rewrite the Body Mass Index problem from Programming Assignment 1 so that it will also display the interpretation of the calculated BMI as follows:

BMI	Weight Status
Below 18.5	Underweight
18.5 – 24.9	Normal
25.0 – 29.9	Overweight
30.0 and Above	Obese

Here is a sample run:

```
Enter weight in pounds: 146
Enter height in inches: 70

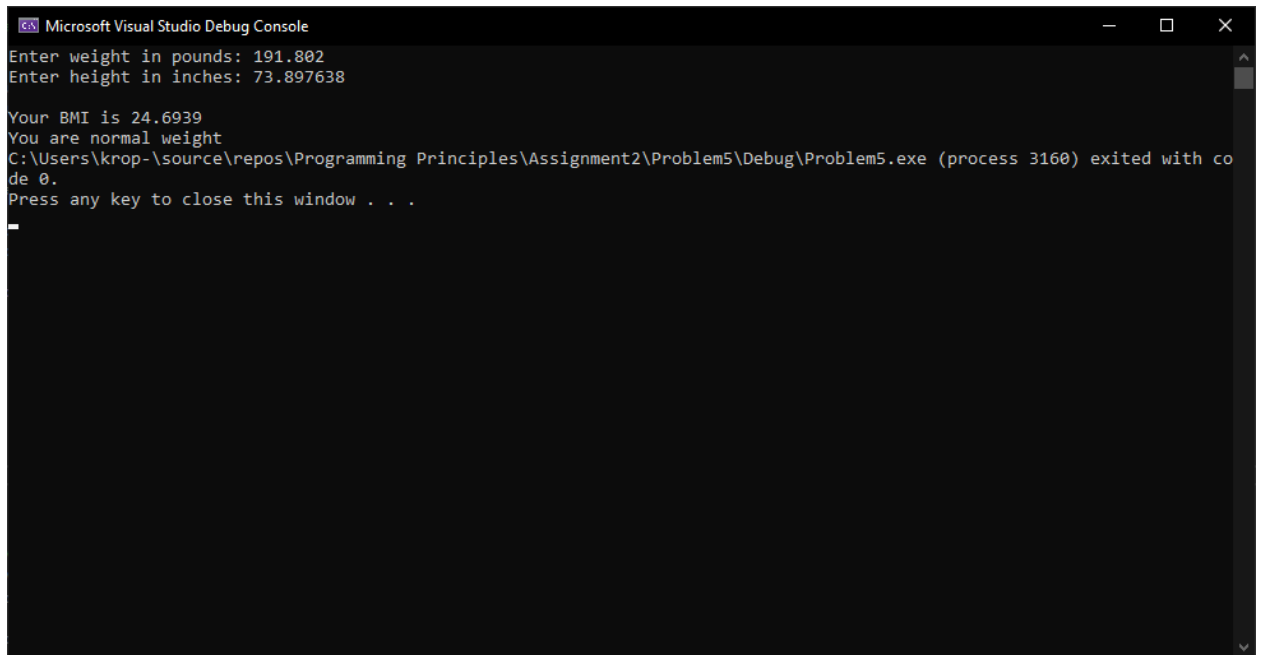
Your BMI is 20.9486
You are normal weight
```



```
Microsoft Visual Studio Debug Console
Enter weight in pounds: 146
Enter height in inches: 70

Your BMI is 20.9486
You are normal weight
C:\Users\krop-\source\repos\Programming Principles\Assignment2\Problem5\Debug\Problem5.exe (process 8524) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

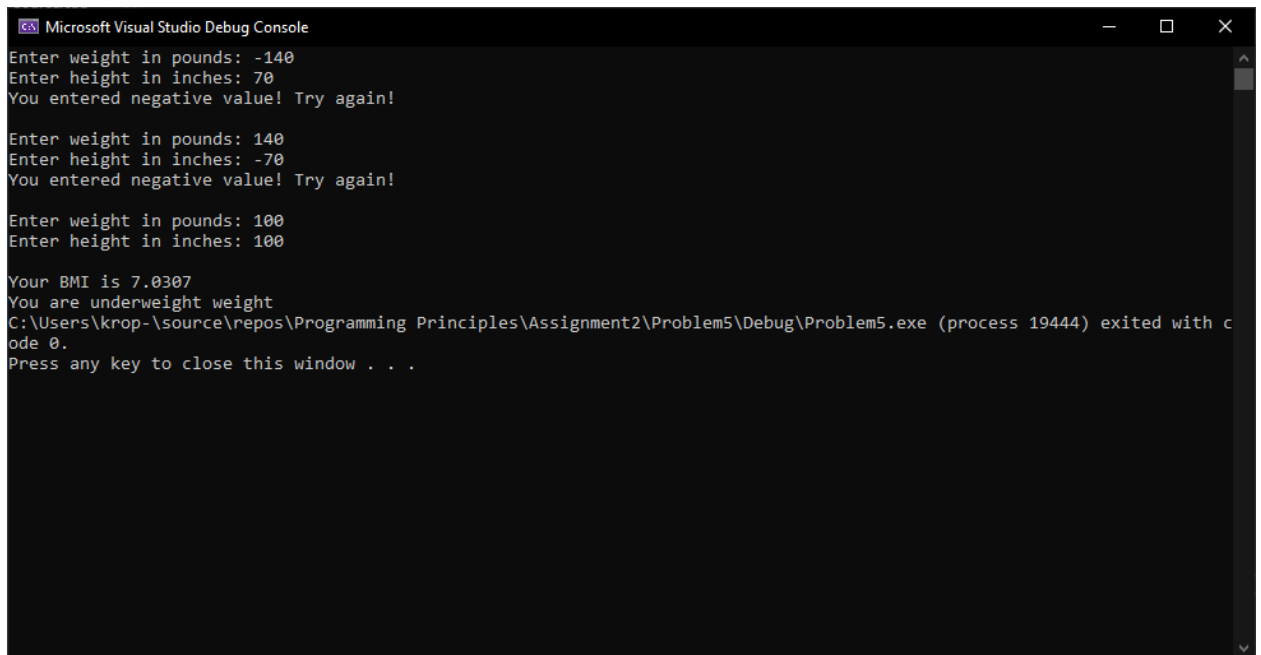
Pic. 1. Try to enter integer numbers. Code compiled successfully.



```
Microsoft Visual Studio Debug Console
Enter weight in pounds: 191.802
Enter height in inches: 73.897638

Your BMI is 24.6939
You are normal weight
C:\Users\krop-\source\repos\Programming Principles\Assignment2\Problem5\Debug\Problem5.exe (process 3160) exited with code 0.
Press any key to close this window . . .
```

Pic. 2. Try to enter double numbers. Code compiled successfully.



```
Microsoft Visual Studio Debug Console
Enter weight in pounds: -140
Enter height in inches: 70
You entered negative value! Try again!

Enter weight in pounds: 140
Enter height in inches: -70
You entered negative value! Try again!

Enter weight in pounds: 100
Enter height in inches: 100

Your BMI is 7.0307
You are underweight weight
C:\Users\krop-\source\repos\Programming Principles\Assignment2\Problem5\Debug\Problem5.exe (process 19444) exited with code 0.
Press any key to close this window . . .
```

Pic. 3. Try to enter negative numbers. Program asks for re-entering a value. Code compiled successfully.