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IAG0581 Programming I

Function y = f(x)
Homework I

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Decleration

I hereby certify that I am the sole author of this report and that no part of this report has been published or submitted for publication. All works and major viewpoints of the other authors, data from other sources of literature and elsewhere used for writing this paper have been referenced.

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Task, Function Graphic

In this task we tried to give input to a function and see the output. The function I had to deal with can be seen below in the Figure 1.

$$y = \frac{1}{\sqrt{x^2 - \frac{1}{x}}} - \frac{2}{3\sqrt{5 - x^2}}$$

Figure 1: Function

In my function x cannot b “0” because a number cannot be divided into “0”. Also inside a square root shouldn’t be minus since it will give a result as a complex number. And when it gives a complex number I should display “**Complex**” or when it gives infinite, I should display “**Infinite**”.

The function graphic can be seen below in the Figure 2.

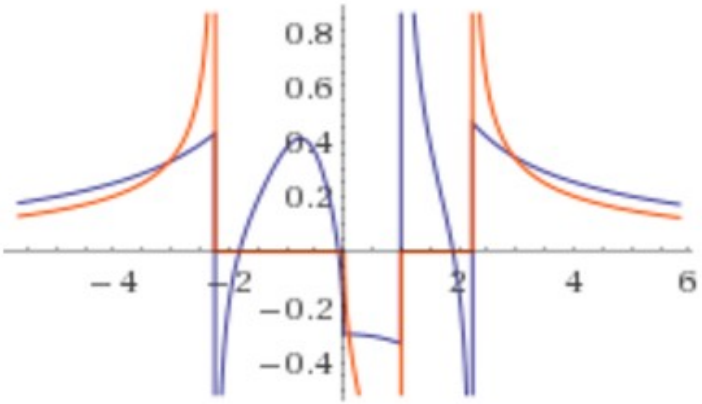


Figure 2: Function’s graphic

According to the graphics and the calculation x should be between 1 and 2. When it is bigger than 2 it will always give a complex number. Since H and C have to be bigger than 0, it almost every time gives a complex number. So there is nothing to see if I chose x between 1.2 after the second step.

Program Explanation

When I was writing my code I used Ubuntu OS and I did my coding using VIM. Also compiled it using gcc compiler. And I also declared some restrictions for the input numbers. N is not allowed to be bigger than 15 and it cannot be 0 or minus 0. Also C has to be bigger than or equal to 1 and H has to be bigger than 0.

I had to use while and for loops to print out the outputs and also restrict the user to not to input the values we don’t want to. I had to include math.h library to use pow and also sqrt functions.

Screenshots

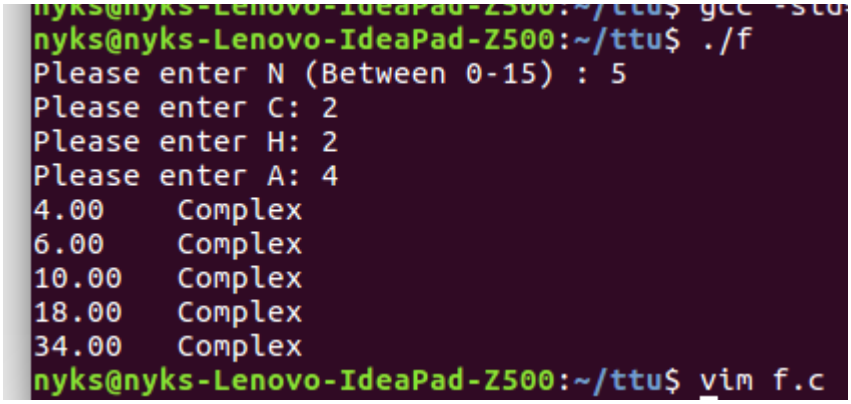


Figure 3: Program input and outputs

When A is 4 there is no way it could show us a not a real number. Giving A the value of 4 will give us the output as a complex number all the time. This can be seen in Figure 3.

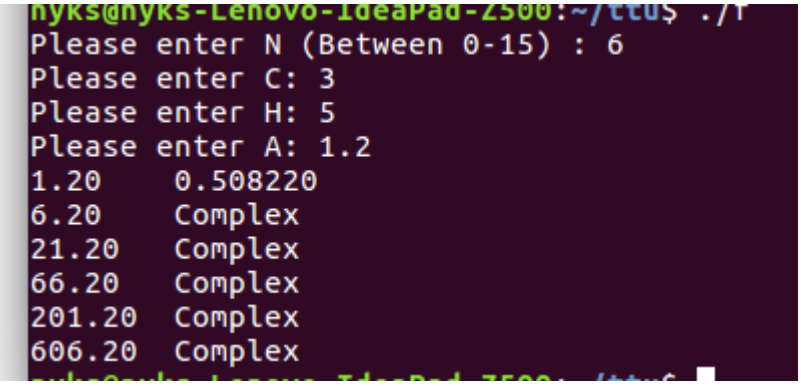
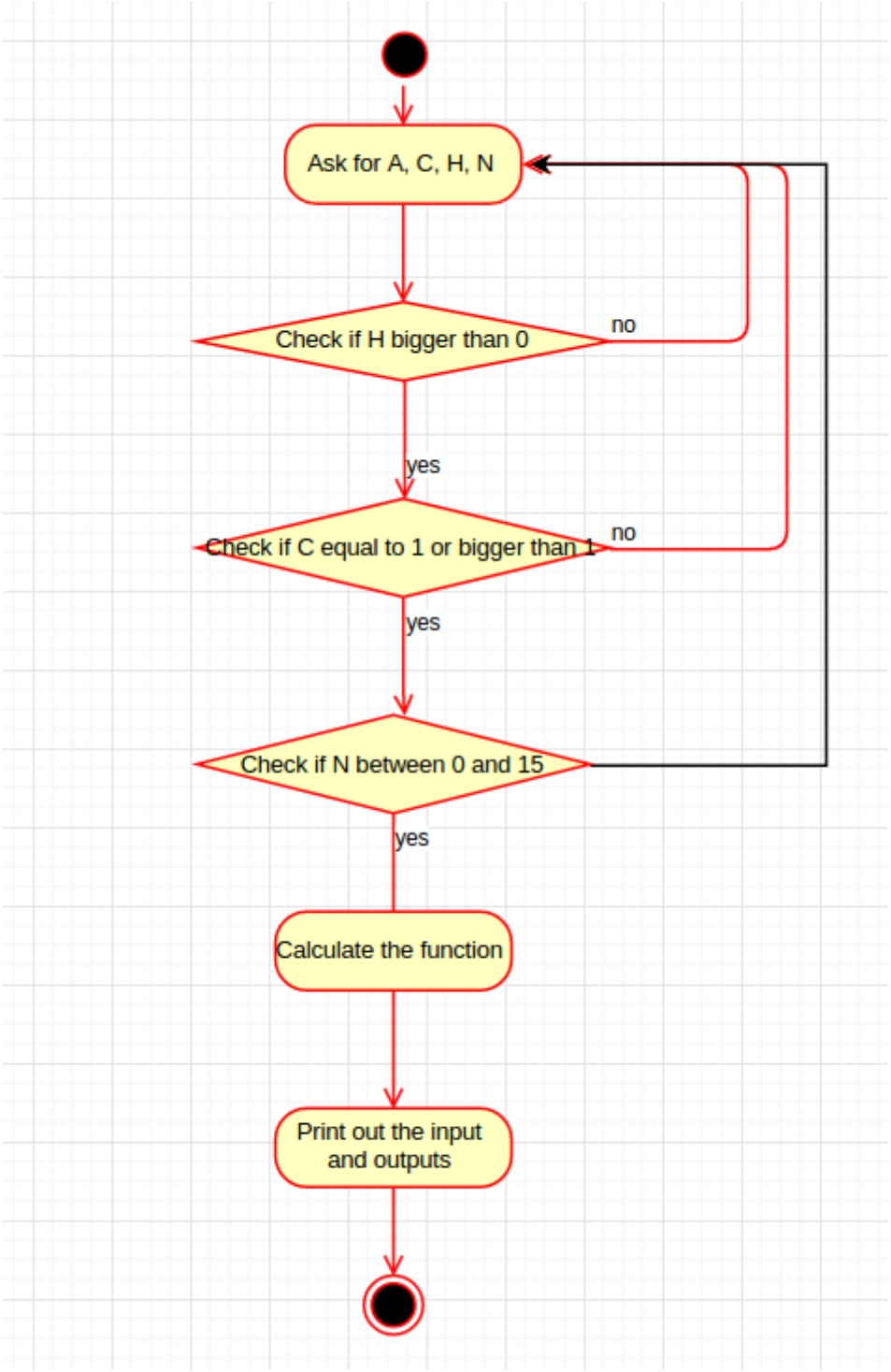


Figure 4: Program input and outputs

When we give 1.2 to A, only on the first step we can see a value, because it won't be bigger than 2. On the other steps it is always bigger than 2, so it will again give us a complex number.

Algorithm


Ask for A, C, H, N
Check if H bigger than 0
no
yes
Check if C equal to 1 or bigger than 1
no
yes
Check if N between 0 and 15
yes
Calculate the function
Print out the input and outputs