TALLINN UNIVERSITY OF TECHNOLOGY

SCHOOL OF INFORMATION TECHNOLOGIES

Faculty of Computer Systems

223662MVEB

IAX0583 Programmeerimine I

**FUNCTION TABULATION**

Homework no.1

Supervisor: Associate Professor Vladimir Viies

Tallinn 2022

**Copyright declaration**

**I have prepared this work independently. All the work of other authors used in the preparation of the work, important points of view, data from literary sources, and the seller are cited.**

**Rostyslav Boichuk 223662MVEB**

**Signature:**

**Contents**

**Statement of the task ...........................................................................4**

**Exploring the function ........................................................................5**

**Algorithm .............................................................................................6**

**Program code .......................................................................................7**

**Explanation of the program.................................................................9**

**Setting up the task**

The task of homework is to create an algorithm and its corresponding program in C language. It is necessary to format the results in the form of a table, where one column contains x values and the other - y values.

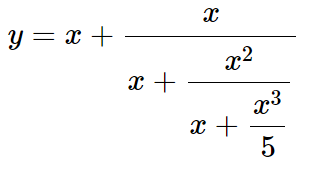
|  |  |
| --- | --- |
| **Argument** | **Function** |
| 1 | 1.54 |
| 2 | 2.64 |
| 3 | 3.73 |
| 4 | 4.8 |

The initial values A and B of the argument x and the number of steps N are taken form imput.

Step size is calculated by the following formula H = (B-A)/(N-1).

The value of the function y is calculated at the points: A, A+H, A+2H, …, A+(N-1)\*H.

Function to be solved:



**Exploring the function**

Given a function:

A picture containing white, dirty, day, tiled

Description automatically generated

Function definition range: (-∞;0), (0;-∞)

Range of function: all real numbers.

# **Algorithm**

**Diagram

Description automatically generated**

**Program code**

*#include* <stdio.h>

*#include* <math.h>

float getY(float);

int main(void)

{

*// declare all the required variables*

    float A, B, N;

    float x;

    float H;

    float y;

*// input values*

    printf("Enter A: ");

    scanf("%f", &A);

    printf("Enter B: ");

    scanf("%f", &B);

    printf("Enter N: ");

    scanf("%f", &N);

    H = (B - A) / (N - 1); *// calculate the step size*

*for* (int i = 0; i < N && i < 15; i++)

    {

        x = A + i \* H; *// calculate the x value for ecah step*

*if* (x == 0) *// exclde the case of x = 0, as the value of y is undefined*

        {

            printf("%f\t", x);

            printf("not avilable\n");

        }

*else*

        {

            printf("%f\t", x);

            printf("%f\n", getY(x));

        }

    }

*return* 0;

}

float getY(float x){

    float y;

    y = x + (x / (x + (pow(x, 2) / (x + ((pow(x, 3)) / 5)))));

*return* y;

}

**Program explanation**

1. Calculating the function is the program's main goal. The specified function is examined and its determination region is identified for this purpose. The algorithm and the C program that runs it are then compiled.

There are several parts of the program:

* declare all the required variables
* input required values
* Calculation of step size(H).
* Calculating x value for each step
* exclude the case of x = 0, as the value of y is undefined
* Return y.
* Print the result.