KAMRAN BALAYEV 17011904

Summary of C code of Basic Iteration Method:

First of all, i have included math.h library in order to use trigonometric functions.

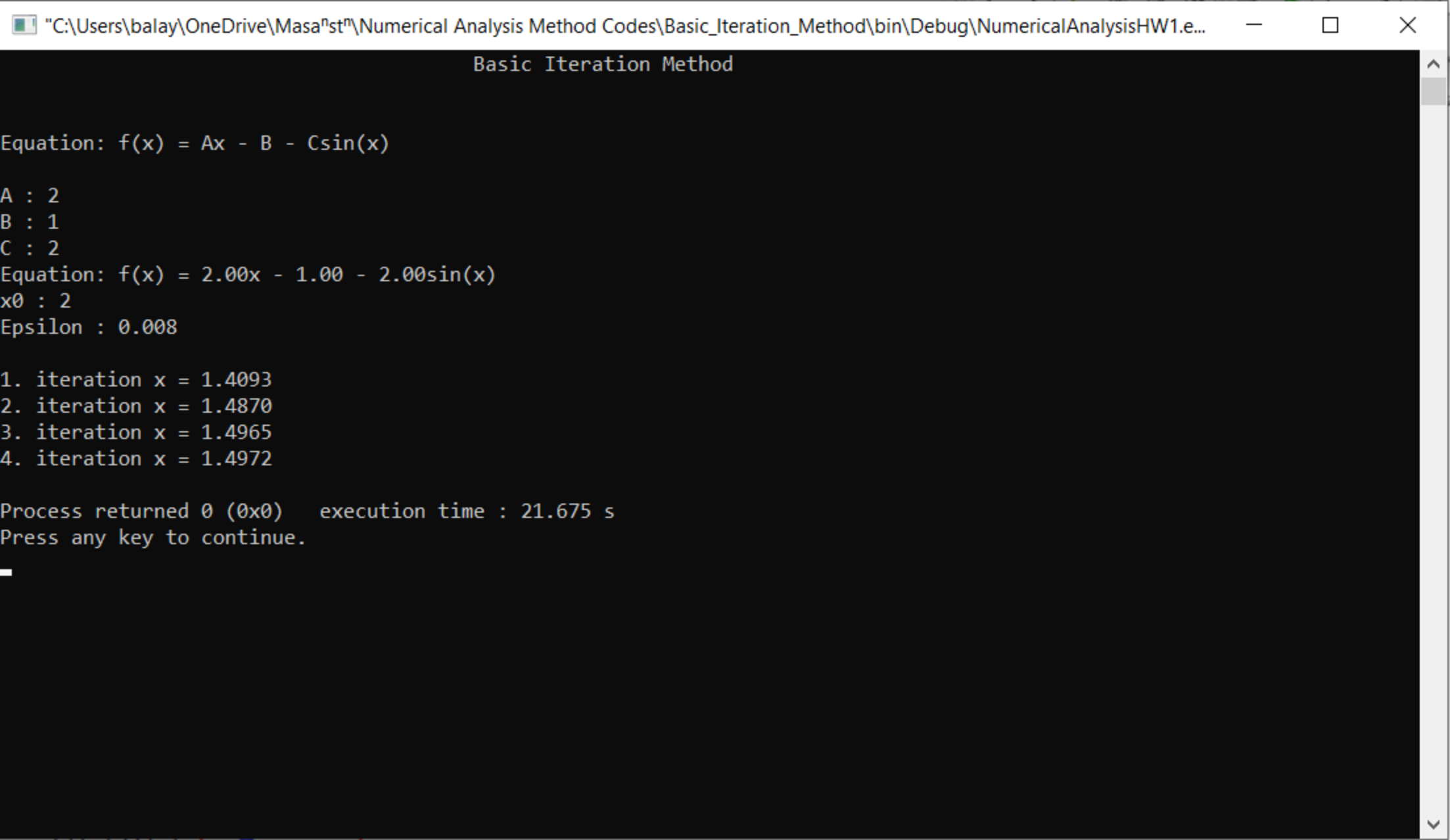
In the Basic Iteration Method we need to divide equation into 2 part, in this code i only mention necessary part of equation which i will use it later for mathematical processes. Type of this function is float in order to get precise values with fractions.

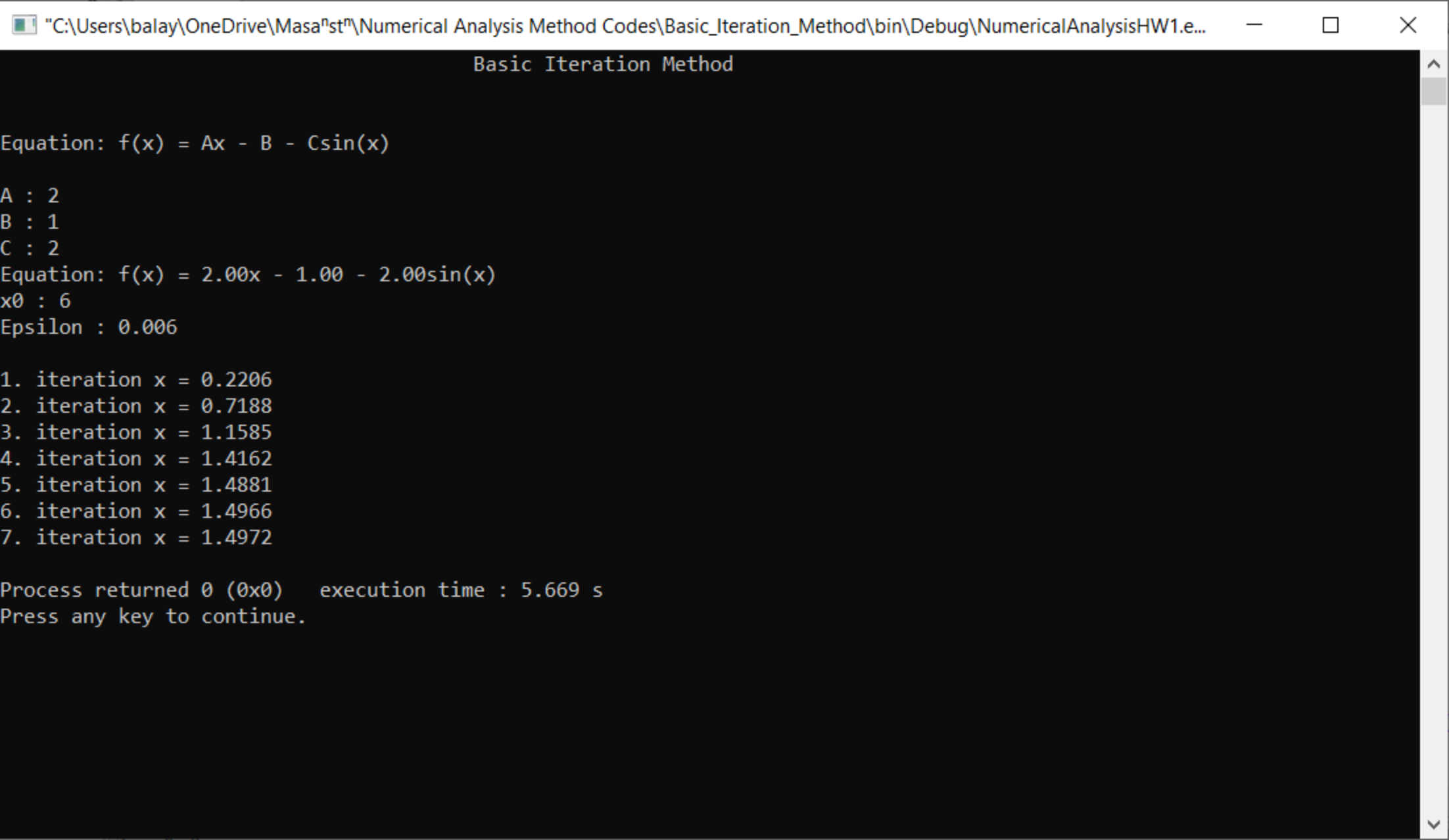
In the main function after asking inputs from user i have called the function in order to get xk+1 value. Then, i have used while loop with condition which is absolute difference of xk and xk+1 <= epsilon value. Inside this loop the next value of xk will equal to xk+1, and next value of xk+1 will be calculated by calling the function.

C code of Basic Iteration Method:

```
/* Basic Iteration Method*/

#include <stdio.h>

#include <stdlib.h>

#include <math.h>

float h(float A,float B, float C,double x)

{

   return  ((B + C*sin(x))/A) ;

}

int main()

{

   printf("\t\t\t\t\tBasic Iteration Method\n\n\n");

   float xk,xk1,eps,A,B,C;

   int ite=2;

   printf("Equation: f(x) = Ax - B - Csin(x)\n\n");
```

```
    printf("A : "); scanf("%f", &A);
    printf("B : "); scanf("%f", &B);
    printf("C : "); scanf("%f", &C);
    printf("Equation: f(x) = %.2fx - %.2f - %.2fsin(x) \n", A,B,C);
    printf("x0 : "); scanf("%f", &xk);
    printf("Epsilon : ");scanf("%f", &eps);
    xk1=h(A,B,C,xk);//call the function with proper values
    printf("\n1. iteration x = %.4f\n", xk1);
    //if absolute difference of xk and xk1 <= epsilon loop will be finished
    while(!(fabs(xk-xk1)<=eps)){
       xk=xk1;
       xk1=h(A,B,C,xk);
       printf("%d. iteration x = %.4f\n", ite, xk1);
       ite++;
    };
    return 0;
}
```


"C:\Users\balay\OneDrive\Masaⁿstⁿ\Numerical Analysis Method Codes\Basic_Iteration_Method\bin\Debug\NumericalAnalysisHW1.e...
Basic Iteration Method
Equation: f(x) = Ax - B - Csin(x)
A : 2
B : 1
C : 2
Equation: f(x) = 2.00x - 1.00 - 2.00sin(x)
x0 : 2
Epsilon : 0.008
1. iteration x = 1.4093
2. iteration x = 1.4870
3. iteration x = 1.4965
4. iteration x = 1.4972
Process returned 0 (0x0) execution time : 21.675 s
Press any key to continue.


"C:\Users\balay\OneDrive\Masaⁿstⁿ\Numerical Analysis Method Codes\Basic_Iteration_Method\bin\Debug\NumericalAnalysisHW1.e...
Basic Iteration Method
Equation: f(x) = Ax - B - Csin(x)
A : 2
B : 1
C : 2
Equation: f(x) = 2.00x - 1.00 - 2.00sin(x)
x0 : 6
Epsilon : 0.006
1. iteration x = 0.2206
2. iteration x = 0.7188
3. iteration x = 1.1585
4. iteration x = 1.4162
5. iteration x = 1.4881
6. iteration x = 1.4966
7. iteration x = 1.4972
Process returned 0 (0x0) execution time : 5.669 s
Press any key to continue.