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| MAT3008 박종일 교수님 |
| 수치해석 |
| 과제 2 요약 및 문제풀이 보고서 |

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실외, 표지판, 하늘, 나무이(가) 표시된 사진

자동 생성된 설명

**Chapter 1. Preliminaries**

1.1 Program Structures

Control Structures

Catalog of Standard Structures

iteration : for , while , do while, break

IF structure

Other “standard” structures : switch case(default)

1.2 C Conventions : unlike other programming languages, C makes programmers close to the machine(machine language)

Function Prototype and Header Files

: specify the type of each function parameter(function declaration or definition-> introduce a function to a routine that is going to call it)

: C program consists of multiple sources files, the compiler cannot check the consistency of each function call without additional assistance so we need header file to distinct them.

Vectors and One-dimensional Arrays

Matrices and Two-dimensional Arrays

Complex Arithmetic : It can use the functions in complex.c but simply, thre is no ideal solution

Implicit Conversion of Float to Double : With the result of such an arithmetic operation, the high precision is immediately thrown away-> all arithmetic is done in double precision.

1.3 Error, Accuracy and Stability

*how to use pointers for memory allocation*

There is a correspondence between pointers and arrays. The expression referenced a[j] is defined to be \*((a)+(j)) which is known as pointer expression. Both points to a legal data location(array element a[0] is typically always defined). The important thing is that pointers point to a variable memory with a typed value by referencing that variable, not by name but by address. It does not have a value simply by being declared. There should be a way to give it an address as a value(We can derive the address of a variable by placing a “&” symbol in front of the variable name).

*how to use pointer to function*

There are some difference between normal pointers. A function pointer points to code which means that it stores the start of executable code. There are also not allocated in memory, it doesn’t have to be deallocated such as free(). Like normal pointers which include data, a function pointer can be passed as an argument and can also be returned from a function. the function pointers can be used as array like normal pointers.

**solve the problems**

*3.6*

true value = = 0.006737947

i)

|  |  |  |
| --- | --- | --- |
| Order |  |  |
| 0 | -147 | X |
| 1 | 594.65 | 1.25 |
| 2 | -1260 | 1.47 |
| 3 | 1831 | 1.69 |
| 4 | -2033.5 | 1.9 |
| 5 | 1831.4 | 2.11 |
| 6 | -1389.3 | 2.32 |
| 7 | 911.2 | 2.53 |
| 8 | -526.6 | 2.73 |
| 9 | 272.2 | 2.95 |
| 10 | -127.2 | 3.11 |
| 11 | 54.31 | 3.41 |
| 12 | -21.33 | 3.39 |
| 13 | 7.76 | 4.3 |
| 14 | -2.63 | 2.86 |
| 15 | 0.83 | -20.85 |
| 16 | -0.25 | 0.87 |
| 17 | 0.07 | -0.34 |
| 18 | -0.186 | 0.087 |
| 19 | 0.0047 | -0.023 |
| 20 | -0.0011 | 0.0058 |

ii)

|  |  |  |
| --- | --- | --- |
| Order |  |  |
| 0 | -147 | X |
| 1 | -23.8 | 0.833 |
| 2 | -7.02 | 0.676 |
| 3 | -2.77 | 0.53 |
| 4 | -1.27 | 0.398 |
| 5 | -0.623 | 0.285 |
| 6 | -0.312 | 0.192 |
| 7 | -0.154 | 0.121 |
| 8 | -0.07 | 0.07 |
| 9 | -0.0329 | 0.037 |
| 10 | -0.0139 | 0.018 |
| 11 | -0.0055 | 0.00829 |
| 12 | -0.002 | 0.00344 |
| 13 | -0.0007 | 0.0013 |
| 14 | -0.0002 | 0.00047 |
| 15 | -0.00007 | 0.00016 |
| 16 | -0.00002 | 0.00005 |
| 17 | -0.000005 | 0.00001 |
| 18 | -0.000001 | 0.000004 |
| 19 | -0.0000003 | 0.000001 |
| 20 | -0.00000008 | 0.000003 |

*3.7*

x = 0.577 -> f’(x) = 2352910.7926019

i) 3-digit

6x = 3.46 and x\*x = 0.332 -> 1 – 3\*x\*x = 1 – 0.996 = 0.004

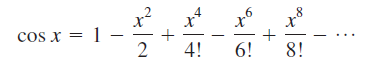
f’(0.557) = 3.46/(0.004\*0.004) = 216250

ii) 4 -digit

6x = 3.462 and x\*x = 0.3329 -> 1 – 3\*x\*x = 1 – 0.9987 = 0.0013

f’(0.577) = 3.462/(0.0013\*0.0013) = 2048251

*4.2*



n = 2 -> = 0.005

i) = 1 – = 0.451688 -> 0.45%

= -1.2139 (<-0.005)

ii) = 1 – = 0.501796 -> 0.50%

= 0.09986 (> 0.005)

iii) = 1 – = 0.499965 -> 0.50%

= -0.0036 (< 0.005)

*4.5*



x = 3 -> f(x) = 25\*3\*3\*3-6\*3\*3+7\*3-88 = 554

f’(x) = 75x^2 – 12x +7 -> f’’(x) = 150x – 12 -> f’’’(x) = 150

i) f(1) = 25\*1 – 6\*1 + 7\*1 -88 = -62

-> 111.191336%

ii) f(1) + f’(1)(3-1) = -32 + (75-12+7)\*2 = 78

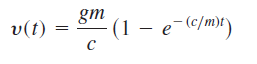
-> 85.920578%

iii) f(1) + f’(1)(3-1) + f’’(1) = 78 + (150-12)\*4/2 = 354

-> 36.101083%

iv) f(1) + f’(1)(3-1) + f’’(1)+ f’’’(1) = 354 + 150\*8/6 = 554

*4.12*



t =6 , g = 9.81, c = 12.5 ∓ 1.5 and m = 50 ∓ 2

= |-1.3881| |0.347|

v = (1-) = 30.48437 ∓ 2.77615

30.484373 ∓ 2.77615