

Rough weather in the C of Cs can cause consult the associated TA immediately for If you ever feel C-sick early preventive medication. Delay could cause unsolvable issues.

WARMING UP FOR THE EXPEDITION TO SAIL THE SEA OF CS FIRST TASK: UNDERSTANDING ALGORITHMS

- A finite sequence of <u>unambiguous</u>, <u>executable steps</u> which when followed achieves a <u>specific objective</u>.
- · An <u>algorithm</u> always <u>terminates</u>.
- A <u>program</u> is a <u>machine executable version of the algorithm</u> which may or <u>may</u> not terminate. (e.g. : Operating system is a program which does not terminate).

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ALGORITHM LARGESTNUMBER

(SOURCE: WIKIPEDIA)

L = [2, 8, 1]

LargestNumber

```
Input: A non-empty list of numbers L.

Output: The largest number in the list L.

largest \leftarrow 0

for each item in the list L \ge 1,

do

if item > largest,

2>0?
```

then largest ← item

2>0? largest ← 2 8 > 2? largest ← 8 1 > 8? Do not altar largest

alter

end for return largest is 8

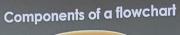
end do

- For instance, "largest ← item" means that the value of largest changes to the value of item.
- "return" terminates the algorithm and outputs the value that follows.

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Flowchart: A representational scheme for algorithms

To find the largest of three given numbers



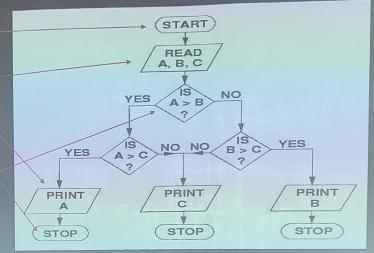
START/STOP

INPUT/ OUTPUT

PROCESS



FLOW OF INFO.



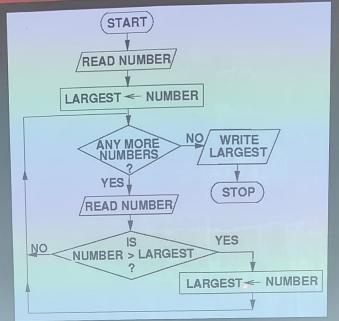
ALGORITHM: LARGEST OF 3 NUMBERS

- 1. READ A, B, C
- 2. IF (A > B) THEN goto 8
- 3. IF (B > C) THEN goto 6
- 4. PRINT C
- 5. STOP
- 6. PRINT B
- 7. STOP
- 8. IF (A > C) THEN goto 10
- 9. goto 4
- 10. PRINT A
- 11. STOF

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SELF HELP: Largest of a set of numbers



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THE SEA OF Cs: A BRIEF HISTORY

- C evolved from two previous languages, BCPL and B.
- Basic Combined Programming Language (BCPL) was developed in 1967 by Martin Richards.
- B, in 1970 by Ken Thompson.
- C, in 1972 by Dennis Ritchie at Bell Labs.
- C is widely used with UNIX operating system.
- Many versions of the language C were created by many people
- This created problems with portability
- ANSI (American National Standards Institute) standardized the language and proposed ANSI-C

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SO, WHAT'S IN A C PROGRAM?

- A C program is a set of functions.
- Every C program should have a function with name main()
- Execution of the program starts with main()
- Some functions that perform common tasks come as part of the C language. These functions are available in libraries.
- For e.g. the functions that perform basic input and output are available in a library
 - called stdio.h (i.e. Standard I/O)

- Libraries that come along with the C compiler are called standard libraries
- So, you need to learn
 - The C language and
 - Also how to use these standard libraries

SAILING THE SEA OF CS: C PROGRAM FOR HOW TO PRONOUNCE C

```
/* Comment: This program Prints -
Pronounce C as SEA */
```

Note the green symbols.
They constitute the syntax.
Adhere to them strictly.

z = f(x,y)z = f()

new line. The cursor is moved to the next line.

Output:

Pronounce C as SEA

C PROGRAM: SUM OF A AND B

```
#include <stdio.h> ____
int main (void)
  int A,B, S;
 printf("Enter two numbers") >
  scanf("%d %d", &A, &B);
  S = A + B;
  printf("Res=%d", S);—
  return 0;
```

Header file:
Standard
Input / Output
Variable
Declarations

Printing message on screen

Asking for inputs from keyboard

Compute

Output Result on screen

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A FEW THINGS BEFORE WE END THIS SESSION

Books:

- Digital Design
- Digital Logic & Computer Design
- Computer System Architecture

Morris Mano

- Programming in C Kelly and Pohl
- C The Complete Reference Herbert Schildt

IN THE NEXT LECTURE: WE WILL C MORE ABOUT C! HAVE A GREAT TIME DREAMING ABOUT THIS SEA! ©



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