

# Problem Solving using Computers

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# Thanks

- All the Mentors
- WebEx for the initial online lectures
- Replit and Online Degree Team
- DCF and our Technical Staff
- Department, Academic Section
- You.

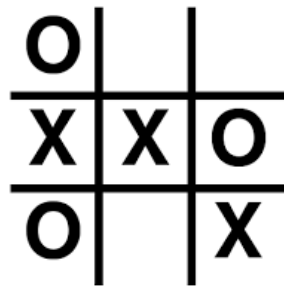
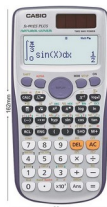
# Placement in Computer Science

- **CS1111: Problem Solving and Coding**
- CS1200: Proofs, Counting
- CS2200: Computation Theory
- CS2300: Overview of Digital World
- CS2600: Hardware
- CS2700: Efficient Implementation
- CS2800: Algorithms
- CS3100: Ways of Programming
- CS3300: Translation (Programmer and Machine)
- CS3500: Resource Management (User and Machine)

CS1111 is a foundational subject feeding into all the other CS courses.



ComputerHope.com



What is Ukraine's ISD code?



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lfmmp!Xpsme"



Future Connect: break is also used to come out of loops.

Binary Search

-2[p]

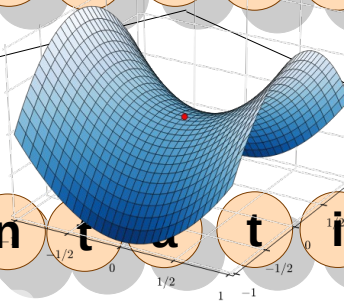
stack heap

Stateful



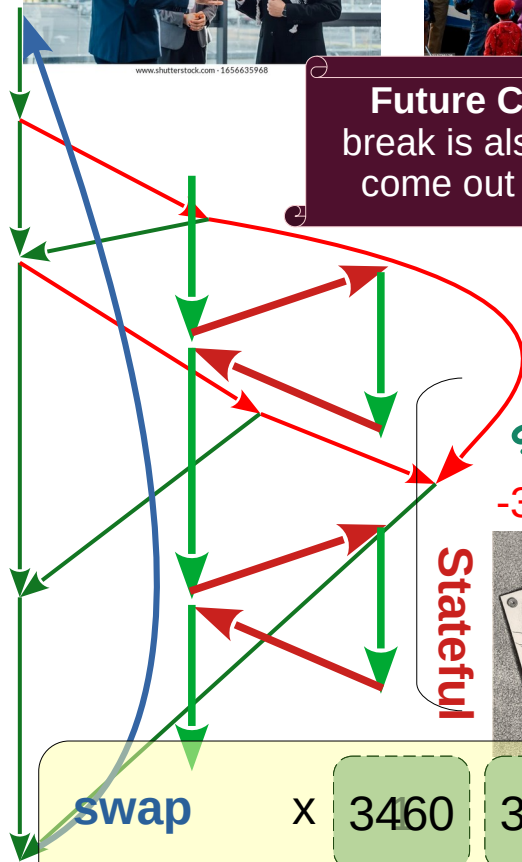
-3 -9 -7 -4 -59 9 58 22 43 4 0 74 55 33 23.8 2 53

Approaches



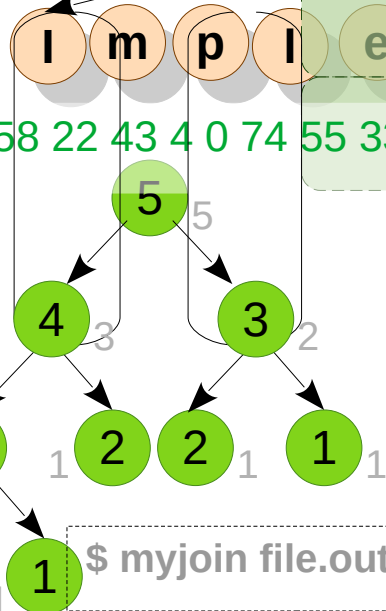
```
int compareByName(struct s arr[], int ii, int jj) {
    return (strcmp(arr[ii].name, arr[jj].name) > 0);
}
void sortByName(struct s arr[], int N) {
    for (int ii = 0; ii < N - 1; ++ii)
        for (int jj = 0; jj < N - ii - 1; ++jj)
            if (compareByName(arr, ii, jj+1) > 0)
                swap(arr, ii, jj+1);
}
```

Makefile



swap

x 3460 3464 y  
6384 6388



\$ myjoin file.out file.in

This statement is wrong.

	<b>Week</b>	<b>Problems</b>	<b>Tools</b>
✓	0	Solve equations, find weighted sum.	Data types, expressions, assignments
✓	1	Find max, convert marks to grade.	Conditionals, logical expressions
✓	2	Find weighted sum for all students.	Loops
✓	3	Encrypt and decrypt a secret message.	Character arrays
✓	4	Our first game: Tic-tac-toe	2D arrays
✓	5	Making game modular, reuse.	Functions
✓	6	Find Hemachandra/Fibonacci numbers.	Recursion
✓	7	Encrypt and decrypt many messages.	Dynamic memory, pointers
✓	8	Maintain student records.	Aggregate data types
✓	9	Search and sort student records.	Searching and sorting algorithms
✓	A	Reduce memory wastage.	Linked lists
✓	B	Implement token system in banks.	Queues
✓	C	IRCTC-like ticket booking system	File handling
✓	D	Putting it all together	All the above

# Electives at IITM



## Theory

Algorithms  
Complexity Theory  
Cryptography  
Graph Theory  
Logic

...



## Systems

Architecture  
Cloud Computing  
Networks  
Parallel Processing  
Systems Security

...



## AI/ML

Deep Learning  
Machine Learning Theory  
Natural Language Processing  
Pattern Recognition  
Reinforcement Learning

...

# Future Connect

- Competitive Programming
  - CodeChef, ICPC, Programming Club
- Courses
  - Stream, Honors
- Projects
  - Github Portfolio, Internships, ...
- UGRC / YRF

**I want you to**

**be a Creator.**