

# CSE101

# Computer Programming

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Lecture #0



# Course Details

- L T P

- 2 0 2

Credit: 4

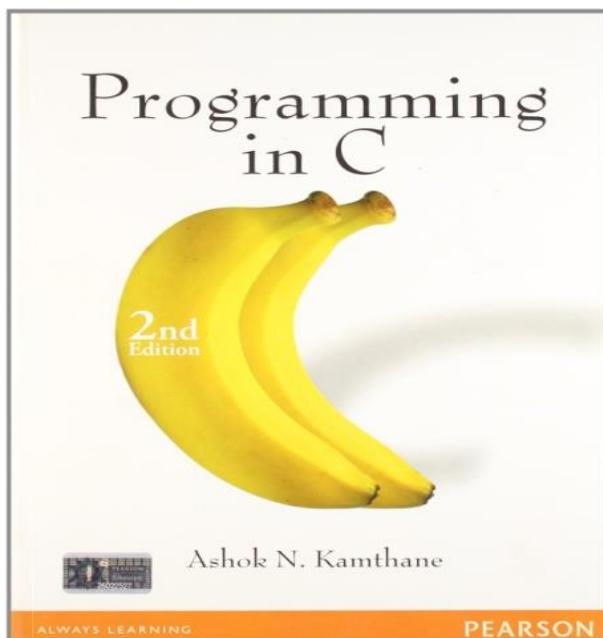
- Text Book

- “PROGRAMMING IN C”

by

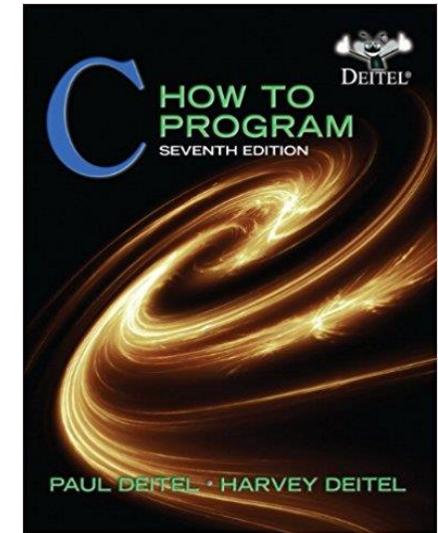
ASHOK N. KAMTHANE

PEARSON, 3<sup>rd</sup> Edition

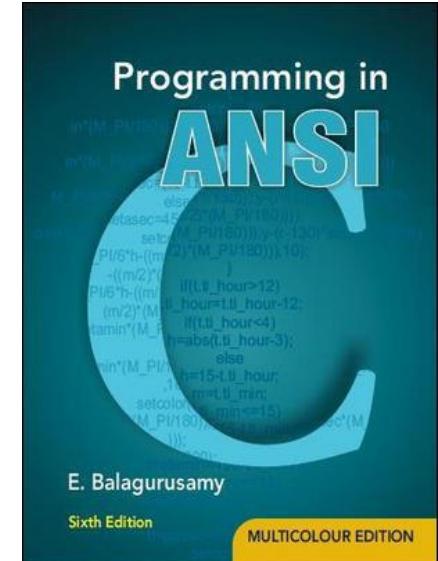


# Reference Books

- “C HOW TO PROGRAM” by PAUL DEITEL AND HARVEY DEITEL PHI(Prentice Hall India)



- “PROGRAMMING IN ANSI C”  
By E. BALAGURUSAMY  
McGraw Hill Education



# Course Outcomes

CO1 :: discuss the various approaches towards solving a particular problem using the C language constructs

CO2 :: write programs to solve different problems using C constructs irrespective of the compilers

CO3 :: plan the process of code reuse by forming a custom library of one's own functions

CO4 :: complete the understanding and usage of one of the building blocks of data structures namely pointers

CO5 :: categorize the theoretical knowledge and insights gained thus far to formulate working code

CO6 :: validate the underlying logic and formulate code which is capable of passing various test cases

# Course Assessment Model

| • CSE101                         | Marks break up* |
|----------------------------------|-----------------|
| • Attendance                     | 5               |
| • Daily Practice Problems        | 20              |
| • CA (Two best out of Three ATs) | 30              |
| • ETP (Practical /Laptop)        | 45              |
| • Total                          | <b>100</b>      |

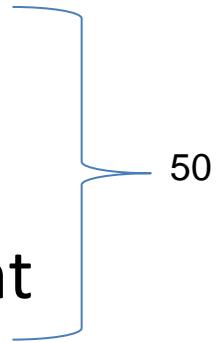
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# Academic Task

| Component               | Week     |
|-------------------------|----------|
| 1. Programming Practice | 1st-14th |
| 2. Test-Code Based1     | 5th      |
| 3. Test-Code Based2     | 10th     |
| 4. Test-Code Based3     | 12th     |

## CA

- Programming Practice using IamNeo Platform
- Best 2 out of 3 Academic Task
- Programming practice is a compulsory requirement



50

## ETP

- Will be conducted on IamNeo Platform

# Practice Problems

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- In the Practice Problems marks are only for coding Problems.
- MCQs are only for practice.

## Sequence locking:

- Student must complete all the problems of lecture 1, to start the problems of lecture 2.

# Academic Task

1. Each Academic task will contain 2 coding questions and 10 MCQs
2. The weightage of programming practice which is spread across 150 problems with 25 problems per unit will be 20%.

# Marks Calculation for Programming Practice

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- In order to qualify for programming practice marks, the student should solve at least 50% of the programming and 50% of MCQ questions (eligibility condition).
- The maximum marks out of 20 marks for which the student would be eligible for Programming Practice would be based on the Percentage of questions solved by the student.
- Example – If a student solves 105 questions out of 150 questions (i.e. 70% questions solved) then the student would be eligible for 70% of 20 marks which is 14 marks (round up would be used in case of decimal values).
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# Marks Calculation for Programming Practice

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- The final marks for Programming Practice would be calculated by prorating the eligible marks for which the student is eligible (as explained in the above point) with the percentage of marks student has scored in the proctored Coding Contests conducted as CA's (The final marks would be round up for the students).
- Example – If a student solves 105 questions out of 150 questions (i.e. 70% questions solved) then the student would be eligible for 70% of 20 marks which is 14 marks.
- And the student has scored 24 out of 30 in the CA's i.e. 80% marks in CA, his Programming practice final marks would be 80% of 14 marks that he was eligible for which is 11.2 rounded up to 12 marks out of 20 for Programming Practice.

# Daily Practice Problems

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| S.<br>No | Unit   | Question   | Tentative Dates for Completion<br>(Subject to change) |
|----------|--------|--|---|
| 1        | Unit-1 |  | 27 <sup>th</sup> February 2024                        |
| 2        | Unit-2 | 25 Multiple Choice Questions and 25 Practical Implementation problems in each unit | 10 <sup>th</sup> March 2024                           |
| 3        | Unit-3 |  | 24 <sup>th</sup> March 2024                           |
| 4        | Unit-4 |  | 22 <sup>nd</sup> April 2024                           |
| 5        | Unit-5 |  | 5 <sup>th</sup> April 20234                           |
| 6        | Unit-6 |  | 12 <sup>th</sup> May 2024                             |

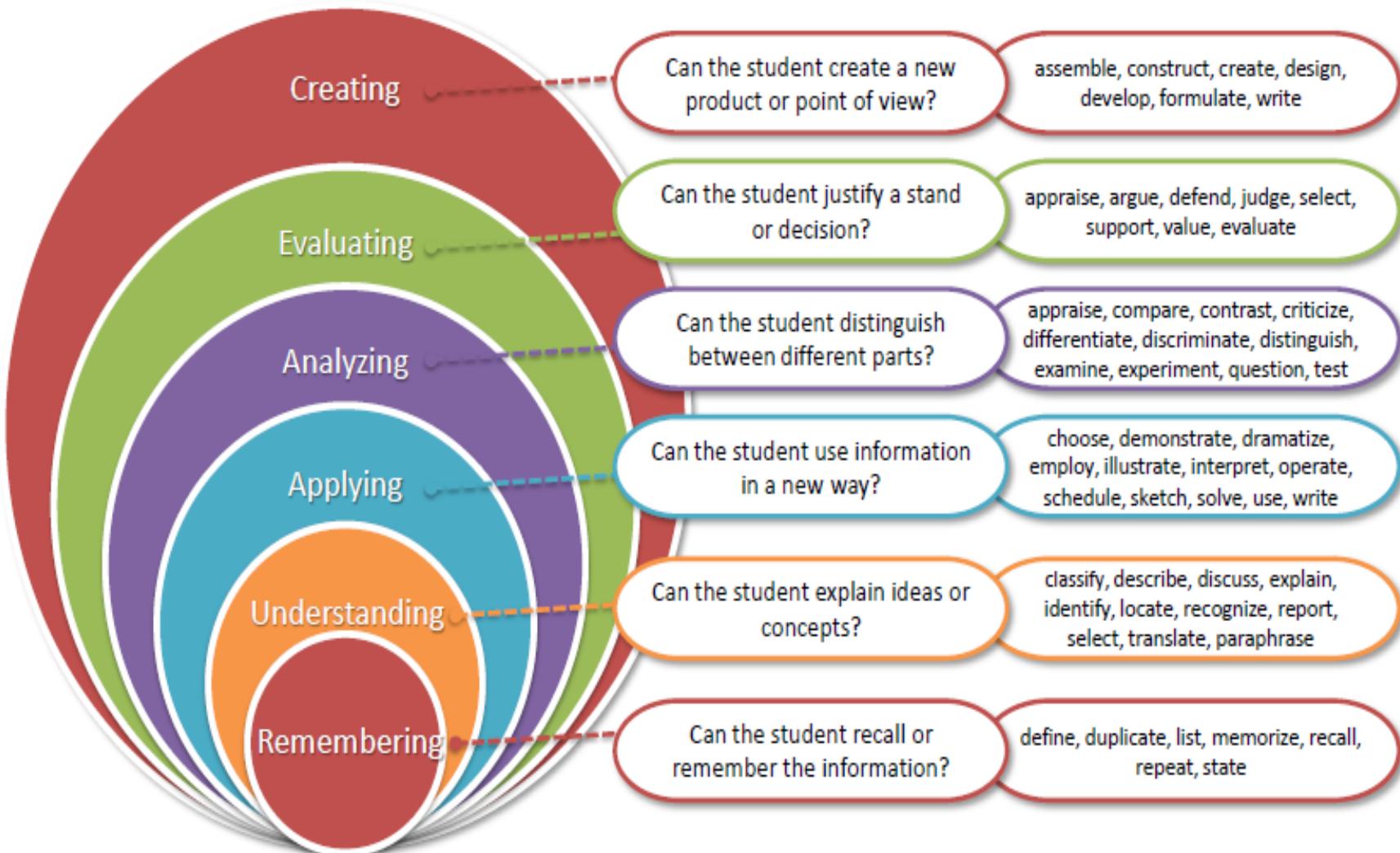
**Note:-** Most Important for the improvement of Performance in Course Assessments.

# End Term Practical (45 Marks)

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- Coding Problems [50%]
- MCQs [20%]
- Viva [30%]

# Revised Bloom's taxonomy (RBT)



# What are Cohorts

- A group of students of a common programme who intend to attain similar characteristics by means of learning similar skills in order to target a particular career opportunity.

# Purpose of Cohorts

- Student shall be able to have a goal oriented approach for his/her career
- Student identifies the goal in the very first year
- Student shall be able to follow the stage wise career progression.
- Early identification of skill set required for selected goal.

 **Cohort 1: Software Development (Product Based)**

 **Cohort 2: Data Science**

 **Cohort 3: Cyber Security**

 **Cohort 4: Full Stack Web Development**

 **Cohort 5: Machine Learning**

 **Cohort 6: Cloud Computing**

 **Cohort 7: Software Methodologies And Testing**

 **Cohort 8: Software Development (Service Based)**

 **Cohort 9: Entrepreneurship**

 **Cohort 10: Mobile Application Development**

 **Cohort 11: Government jobs/Higher studies**

# Star Course

**Hands-on Practice:** A good course which include interactive coding exercises to help you apply what you've learned.

This course is a short bite-sized courses that help students develop foundational-level knowledge and skills in C Programming language. Although the course is packed with high quality content that helps students further with their learning and earn credits.

# OER

| <b>Course Code</b>          | <b>Course Title</b> | <b>Unit mapped</b> | <b>Broad topic</b>                             | <b>OER Type</b>  | <b>Title of OER</b>             | <b>*%age unit mapped with OER (approx)</b> | <b>Source URL</b>  |
|-----------------------------|---------------------|--------------------|--|--|---------------------------------|--|--|
| CSE101:Computer Programming |                     | Unit 1             | Basics and introduction to C                   | Reading material (online tutorial), Practice Questions | C Programming Language Tutorial | 90%  | <a href="https://www.geeksforgeeks.org/keywords-in-c/?ref=lp">https://www.geeksforgeeks.org/keywords-in-c/?ref=lp</a><br><a href="https://www.geeksforgeeks.org/operators-in-c/?ref=lp">https://www.geeksforgeeks.org/operators-in-c/?ref=lp</a>         |
|                             |                     | Unit 2             | Control structures and Input/ Output functions | Reading material (online tutorial), Practice Questions | C Programming Language Tutorial | 90%  | <a href="https://www.geeksforgeeks.org/decision-making-c-cpp/?ref=lp">https://www.geeksforgeeks.org/decision-making-c-cpp/?ref=lp</a>  |
|                             |                     | Unit 3             | User defined functions and Storage classes     | Reading material (online tutorial), Practice Questions | C Programming Language Tutorial | 90%  | <a href="https://www.geeksforgeeks.org/c-functions/?ref=lp">https://www.geeksforgeeks.org/c-functions/?ref=lp</a><br><a href="https://www.geeksforgeeks.org/storage-classes-in-c/?ref=lp">https://www.geeksforgeeks.org/storage-classes-in-c/?ref=lp</a> |

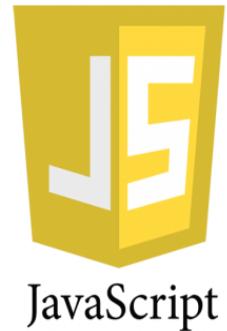
# OER

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|--|---------------------|--------------------|--|--|---------------------------------|--|--|
| CSE101:Computer Programming                    |                     | Unit 4             | Arrays in C  | Reading material (online tutorial), Practice Questions | C Programming Language Tutorial | 90%  | <a href="https://www.eksforgeeks.org/c-arrays/?ref=lbp">https://www.eksforgeeks.org/c-arrays/?ref=lbp</a>  |
|  |                     | Unit 5             | Pointers, Dynamic memory allocation                      | Reading material (online tutorial), Practice Questions | C Programming Language Tutorial | 90%  | <a href="https://www.eksforgeeks.org/c-pointers/?ref=lbp">https://www.eksforgeeks.org/c-pointers/?ref=lbp</a><br><a href="https://www.eksforgeeks.org/dynamic-memory-allocation-in-c-using-malloc-calloc-free-and-realloc/?ref=lbp">https://www.eksforgeeks.org/dynamic-memory-allocation-in-c-using-malloc-calloc-free-and-realloc/?ref=lbp</a> |
|  |                     | Unit 6             | Strings, Derived types including structures and unions : | Reading material (online tutorial), Practice Questions | C Programming Language Tutorial | 90%  | <a href="https://www.eksforgeeks.org/structures-c/?ref=lbp">https://www.eksforgeeks.org/structures-c/?ref=lbp</a>  |
| <b>**Average %age of total syllabus mapped</b> |                     | --                 | ---  | ---  | ---                             | <b>Avg.= 90.0</b>                          | Activated  |

# WHY C?????????????????



□ If we have number of powerful programming languages available with us then why c???????



# The hitch.....

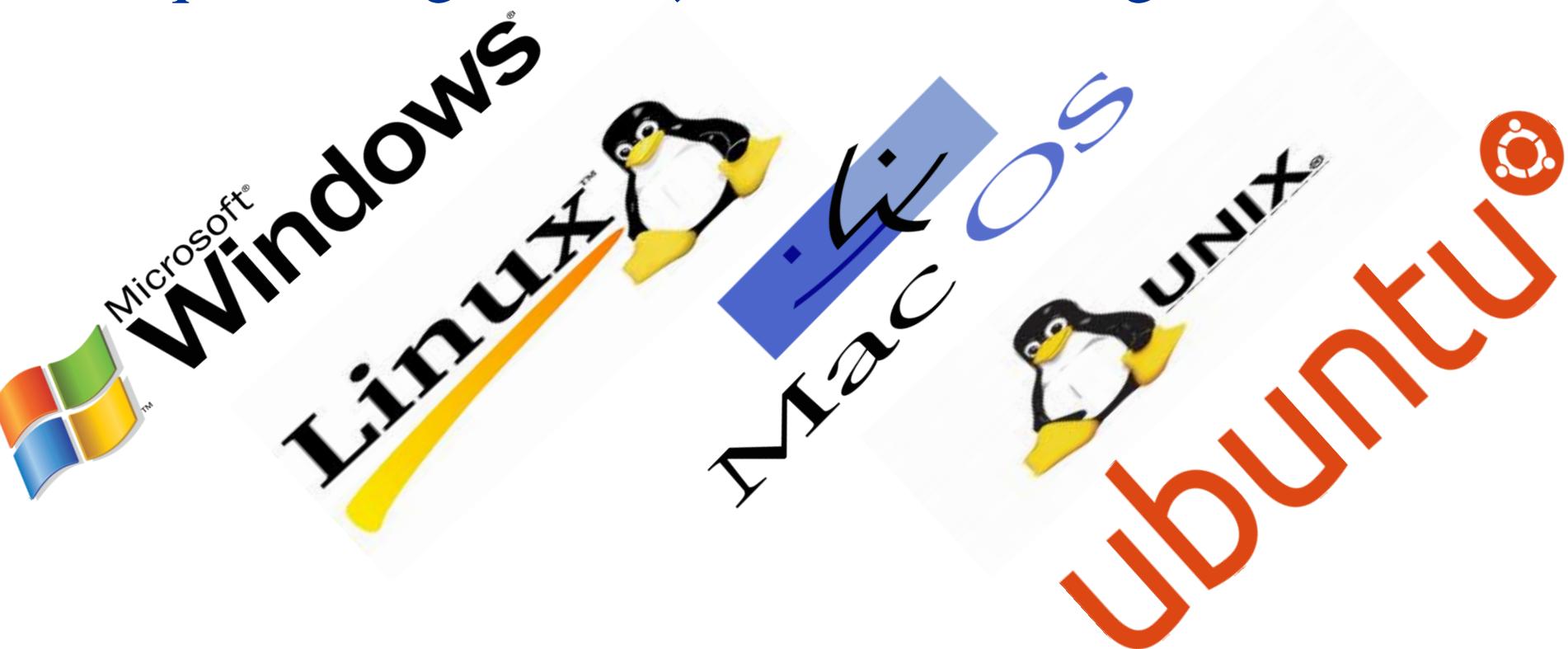
Some burning questions in mind.....

- C is a very old language. Why are we still studying this language??????
- Now, we have very powerful languages with us then, why c??
- There is no scope of this language in industry



# Lets take you close to the reality

- All of us use Computers or Laptops for different purposes.
- Could you tell me which system software is most required to get our system in working mode??????



# Let's Explore more

- Could you tell me which programming language is used in writing all these operating system??????



- Latest version of Microsoft Windows i.e. Windows10 is still being written in C Language



# Windows 10



# Contd.....

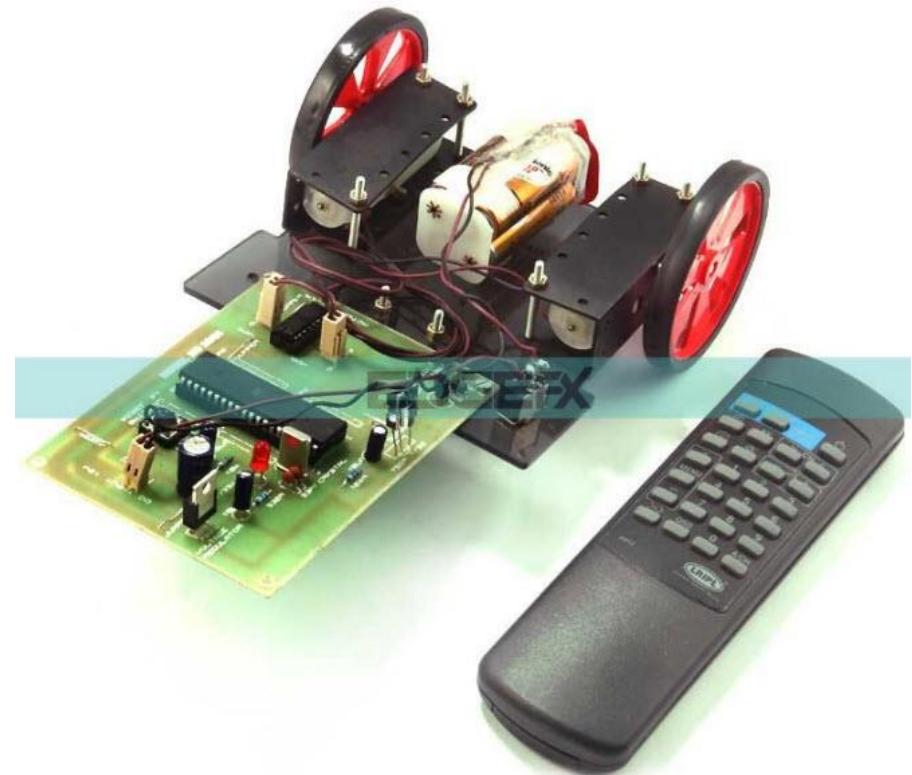
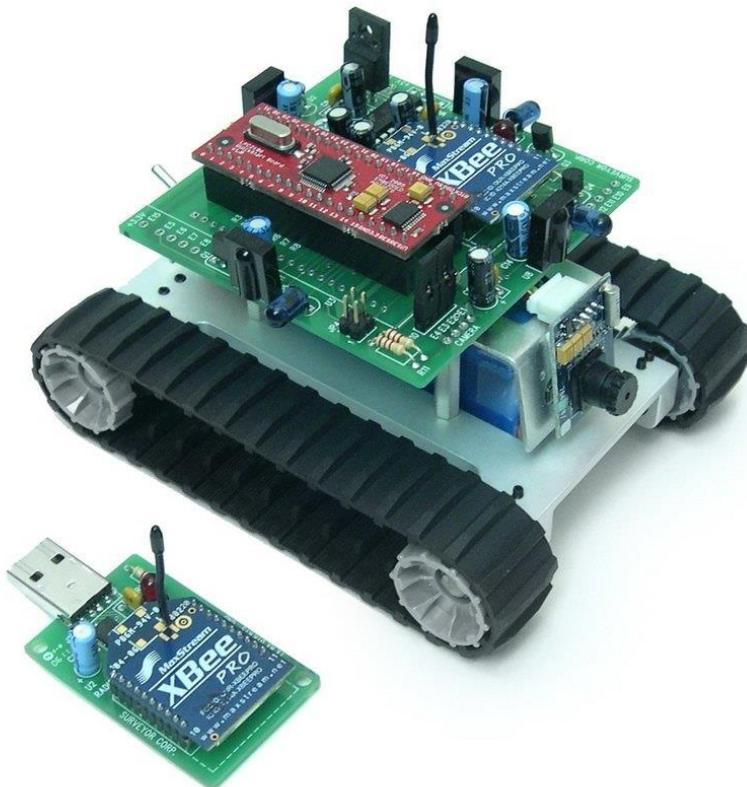
- Device drivers are also written in C language.
- All these modern programming languages are influenced by C language



- Compilers for Python and PHP language are also written in C language

# Contd.....

- Embedded systems are also developed with the help of C language



# Contd.....

- Git



- Oracle Database



- Linux



- Android



- Microsoft Excel



- MySql



- Unix



- Google



# MNCs

*Top rated Companies which has a dearth of C programmers*



Microsoft

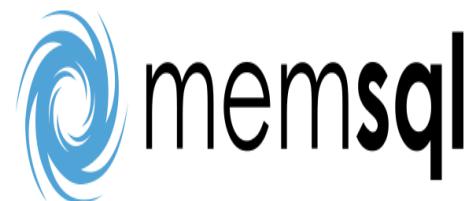


amazon



NVIDIA.

Google



YAHOO!

# Top 10 Programming Languages of 2019-2020

## (As per analysis done by geekforgeeks)

- JavaScript
- Python
- Java
- C/CPP? *C is still in the top 5, which shows its significance and popularity*
- PHP
- Swift
- C#
- Ruby
- Objective – C
- SQL

# Here are the Answers of Questions

- C is very a old language still, why do we study C language??



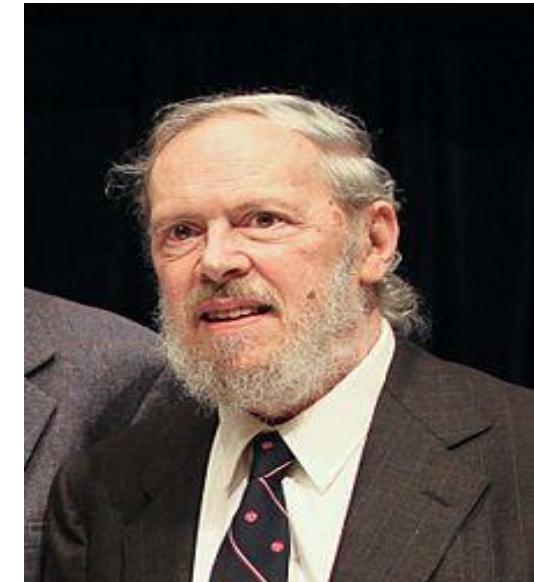
- Now, we have very powerful languages with us then why c??



- There is no scope of this language in industry

# History of C

- Guys Can you make a sentence with the word '*Necessity*'  
“Necessity is the mother of invention”
- Dennis Ritchie and Ken Thompson were working on developing a new operating system i.e UNIX
- But the programming language they were using was not providing them the portability feature
- So Dennis Ritchie developed new language i.e C



# History continued...

## Summary -

|   |                                 |                        |
|---|---------------------------------|------------------------|
| 1 | B Language Developed By         | Ken Thompson           |
| 2 | Operating System Developed in C | UNIX                   |
| 3 | Developed at                    | AT & T Bell Laboratory |
| 4 | Creator of Traditional C        | Dennis Ritchie         |
| 5 | Year                            | 1972                   |

# Why “C” name was given???

- Many of C's principles and ideas were derived from the earlier language B. (Ken Thompson was the developer of B Language.)
- BCPL and CPL are the earlier ancestors of B Language
- CPL is Combined Programming Language. In 1967, BCPL Language ( Basic CPL ) was created as a scaled down version of CPL
- As many of the **features were derived from “B” Language** that's why it was named as “C”.
- After 7-8 years C++ came into existence which was first example of object oriented programming .

# Evolution of C...



2011

C11

2018

C17(Current)

Upcoming

C2x

# Language Developers

|               |                       |
|---------------|-----------------------|
| Algol         | • International Group |
| BCPL          | • Martin Richards     |
| B             | • Ken Thomson         |
| Traditional C | • Dennis Ritchie      |
| K&R C         | • kernighan & Ritchie |
| ANSIC         | • ANSI Committee      |
| ANSI/ISO C    | • ISO Committee       |
| C99           | • Standard Committee  |

# Features of C Language

- Low Level Language Support
- Program Portability
- Powerful and Feature rich
- High Level Features
- Modular Programming

# **Applications of C**

- Used for creating computer applications
- Used in writing embedded software
- Development of Simulators
- Used for creating compilers
- Used to implement different operating system operations
- UNIX kernel is completely developed in C language

# Polling-Questions

Which of the following Operating System was rewritten in C in 1972?

- A. Windows
- B. Linux
- C. Unix
- D. MS-Dos

In which of the following year C language received ISO Standardization?

- A. 1983
- B. 1990
- C. 1999
- D. 2011

# Latest version of C going in the market

- A. C11
- B. C18
- C. C99
- D. C89

# Who developed B language?

- A. Ken Thompson
- B. Dennis Ritchie
- C. Martin Richards
- D. Brian Kernighan

# Course Contents

## Before MTE

- ✓ Data Types & Operators
- ✓ Control Structures
- ✓ User Defined Functions
- ✓ Storage Classes

## After MTE

- ✓ Arrays and Strings
- ✓ Pointers
- ✓ Dynamic Memory Allocation
- ✓ Derived Data Types- Structures and Union

