Data Structures

SHIV NADAR UNIVERSITY CHENNAI

Introduction to Pointers, Input Statement

Subin Sahayam, Assistant Professor,

Department of Computer Science and Engineering
Shiv Nadar University

Last Class Summary

- **Library**
- **Format Specifier**
- **printf – Print Formatted**
- **Program**

Program

```
#include <stdio.h>
void main()
{
    int num1, num2, sum;
    num1 = 5;
    num2 = 10;
    sum = num1 + num2;
    printf("Addition of two
    numbers %d and %d is:
    %d", num1, num2, sum);
}
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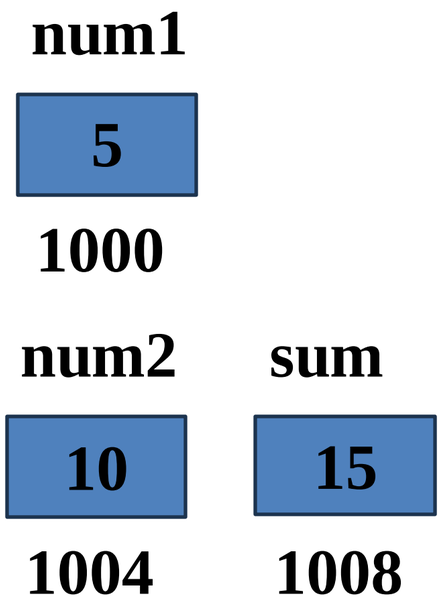
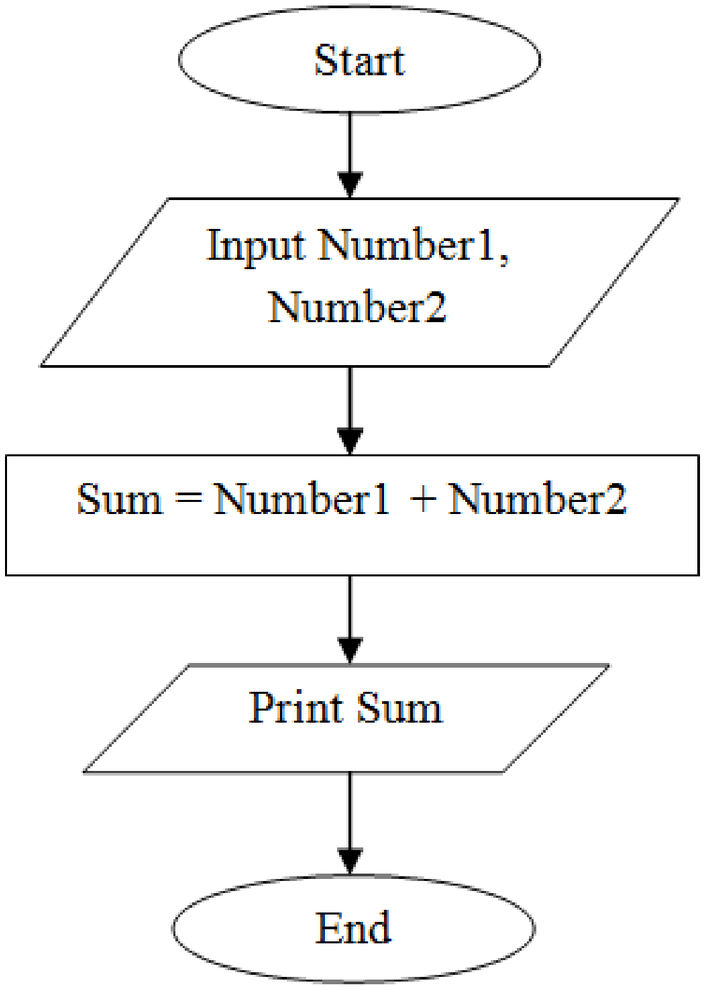
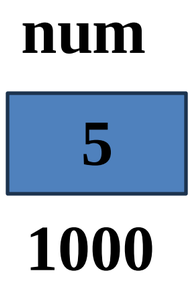




K3

Introduction to Pointers

- **Example Variable 'num'**



Introduction to Pointers

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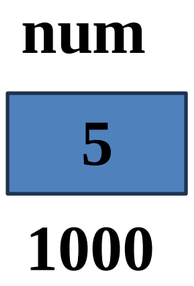
- **Pointers – Special Variables to Store Address**



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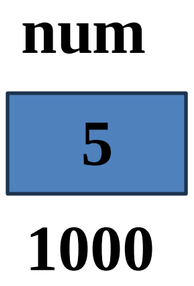

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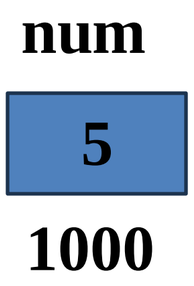

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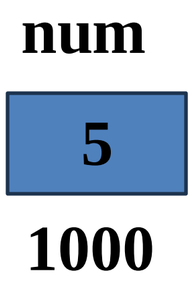

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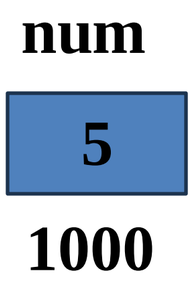

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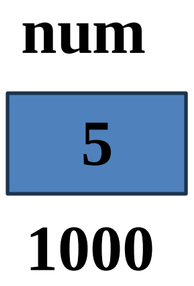

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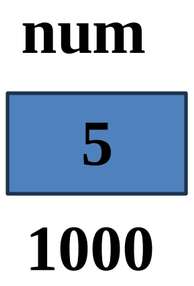

K2

Introduction to Pointers

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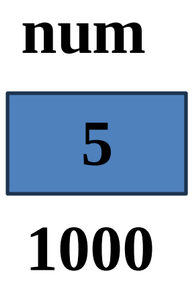
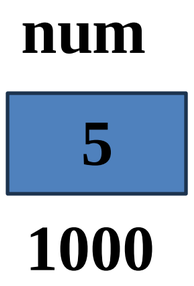
  - **Syntax**
    - **datatype *identifier;**
- **Use '&' operator to get the address of a variable**
  - **Syntax**
    - **identifier = &identifier;**
  - **Empty address is assigned/initialized with "NULL"**



K2

Program

```
//Simple Pointer Program
#include <stdio.h>
int main()
{
    int num = 5;
    return 0;
}
```



Program – Pointer Declaration

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//Simple Pointer Program
#include <stdio.h>
int main()
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    int num = 5;
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```
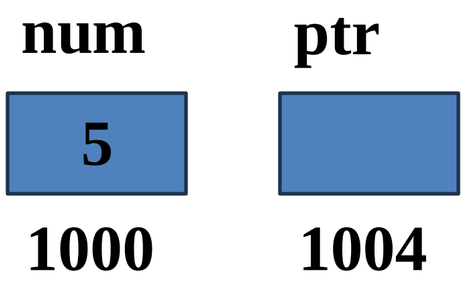
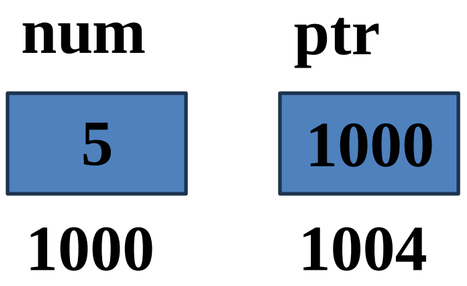



Program – Pointer Initialization

```
//Simple Pointer Program
#include <stdio.h>
int main()
{
    int num = 5;
    int *ptr;
    ptr = &num;
    return 0;
}
```



Introduction to Pointers

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K2

Introduction to Pointers

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K2

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    - **Depends how much address bits your computer can generate**
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K2

Introduction to Pointers

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- **How much memory space is allocated to pointers?**
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      - **Modern processors use – 64 bits**

Introduction to Pointers

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      - **If processor is 32 bit**
      - **32 bits = 4 bytes**
      - **Pointer requires 4 bytes**

Questions?

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Format Specifier

- **Way to Present Data**

%d: for printing integers

%f: for printing floating-point numbers

%c: for printing characters

%s: for printing strings

%p: for printing memory addresses

%x: for printing hexadecimal values

Scan Formatted - printf

- **scanf – identifier**

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- **Syntax**
  - **scanf("formatted_string", &each_arguments_list);**

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Scan Formatted - printf

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- **Used to read values from terminal and store it into variables**
- **Expects address of a variable**
- **Syntax**
  - **scanf("formatted_string", &each_arguments_list);**
- **Return type is int**
  - **Returns the number of successful variables read**
  - **0 – No number read**
  - **Negative number - EOF – End of file error**

Program

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void main()
{
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    num1 = 5;
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    sum = num1 + num2;
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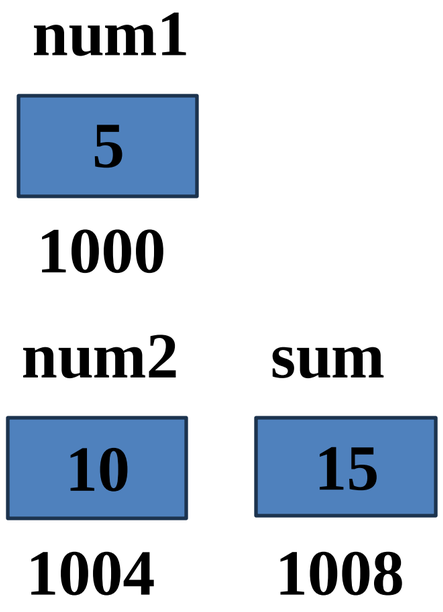

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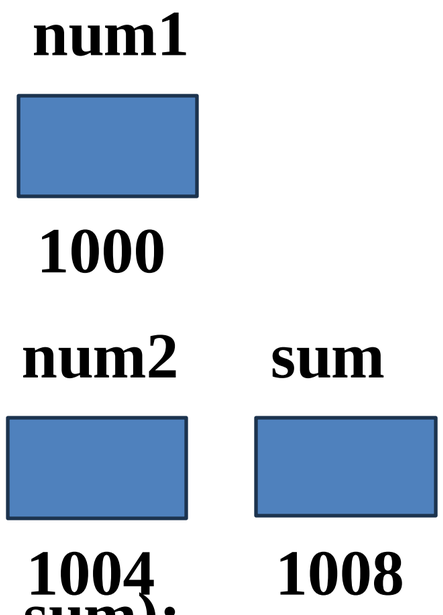

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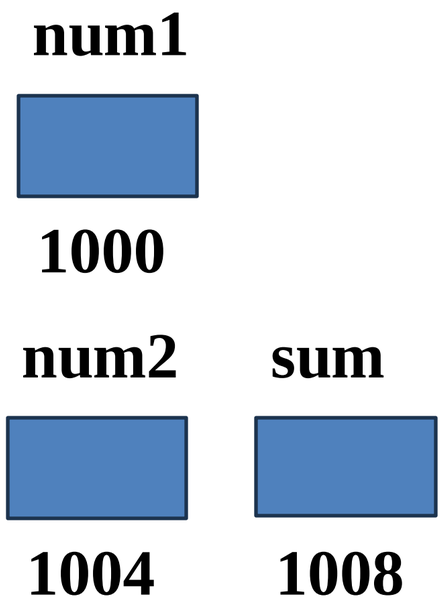

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}
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num1	num2	sum
5	10	15
1000	1004	1008

Questions?

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Today's Course Outcomes

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- **CO1 – Implement C programs from algorithms and flowcharts with error handling. – K3**
- **CO2 – Implement programming fundamentals, decision and looping statements – K3**
- **CO3 – Implement C programs with pointers, arrays, and strings – K3**
- **CO4 – Implement C programs with structures, union, file-handling concepts, and additional features – K3**
- **CO5 – Analyze, breakdown, and solve large computational problems using functions – K4**

K1

Summary

- **Introduction to Pointers**
- **Format Specifier**
- **Scan Formatted – scanf**
- **Program**
- **Today's Course Outcome**

References

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- **Kernighan, B.W and Ritchie, D. M, “The C Programming language”, 2nd edition, Pearson Education, 2006**

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