

# Storage Class Specifiers

**Talk to a Teacher**

**<http://spoken-tutorial.org>**

**National Mission on Education through ICT**

**<http://sakshat.ac.in>**

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# Learning Objectives



# Learning Objectives

**We will learn about**



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**We will learn about**

- ▶ **Storage class specifiers**



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**We will learn about**

- ▶ **Storage class specifiers**
- ▶ **auto keyword**



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- ▶ **static keyword**



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- ▶ **auto keyword**
- ▶ **static keyword**
- ▶ **extern keyword**
- ▶ **register keyword**





# System Requirements



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- ▶ **Ubuntu Operating System version 11.10**



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- ▶ **Ubuntu Operating System version 11.10**
- ▶ **gcc Compiler version 4.6.1 on Ubuntu**



# Prerequisites



# Prerequisites

**You should be familiar with**



# Prerequisites

**You should be familiar with**

- ▶ **C tutorials**



# Prerequisites

You should be familiar with

- ▶ C tutorials
- ▶ For relevant tutorials please visit our website: <http://spoken-tutorial.org>



# Introduction





# Introduction

- **Specifiers tell the compiler where to store a variable**



# Introduction

- ▶ **Specifiers tell the compiler where to store a variable**
- ▶ **How to store the variable**



# Introduction

- ▶ **Specifiers tell the compiler where to store a variable**
- ▶ **How to store the variable**
- ▶ **What is the initial value of the variable**



# Introduction

- ▶ **Specifiers tell the compiler where to store a variable**
- ▶ **How to store the variable**
- ▶ **What is the initial value of the variable**
- ▶ **Life time of the variable**



# Syntax



# Syntax

- ▶ **storage\_specifier data\_type variable\_name**



# Types



# Types

**Types of storage class specifiers are:**





# Types

**Types of storage class specifiers are:**

- ▶ **auto**



# Types

**Types of storage class specifiers are:**

- ▶ **auto**
- ▶ **static**



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- ▶ **auto**
- ▶ **static**
- ▶ **extern**



# Types

**Types of storage class specifiers are:**

- ▶ **auto**
- ▶ **static**
- ▶ **extern**
- ▶ **register**



# auto



# auto

- ▶ **Auto keyword declares an automatic variable**



# auto

- ▶ **Auto keyword declares an automatic variable**
- ▶ **It has a local scope**



# auto

- ▶ **Auto keyword declares an automatic variable**
- ▶ **It has a local scope**
- ▶ **Keywords are not initialized automatically**





# auto

- ▶ Auto keyword declares an automatic variable
- ▶ It has a local scope
- ▶ Keywords are not initialized automatically
- ▶ You should explicitly initialize keywords while declaring



# auto

- ▶ Auto keyword declares an automatic variable
- ▶ It has a local scope
- ▶ Keywords are not initialized automatically
- ▶ You should explicitly initialize keywords while declaring
- ▶ Storage space of keywords is CPU memory



# static



# static

- ▶ **static variables are initialized to 0**



# static

- ▶ **static variables are initialized to 0**
- ▶ They are not destroyed even after program control exits from the block



# static

- ▶ **static variables are initialized to 0**
- ▶ **They are not destroyed even after program control exits from the block**
- ▶ **Value of the variable persists between different function calls**



# static

- ▶ **static variables are initialized to 0**
- ▶ **They are not destroyed even after program control exits from the block**
- ▶ **Value of the variable persists between different function calls**
- ▶ **Storage space is CPU memory**



# extern





# extern

- ▶ **Scope of extern variable is throughout the main program**



# extern

- ▶ **Scope of extern variable is throughout the main program**
- ▶ **Definition for extern variable might be anywhere in the C program**



# extern

- ▶ **Scope of extern variable is throughout the main program**
- ▶ **Definition for extern variable might be anywhere in the C program**
- ▶ **extern variables are initialized to 0 by default**



# extern

- ▶ Scope of extern variable is throughout the main program
- ▶ Definition for extern variable might be anywhere in the C program
- ▶ extern variables are initialized to 0 by default
- ▶ They can be accessed by all functions in the program



# extern

- ▶ Scope of extern variable is throughout the main program
- ▶ Definition for extern variable might be anywhere in the C program
- ▶ extern variables are initialized to 0 by default
- ▶ They can be accessed by all functions in the program
- ▶ **Stored in CPU memory**



# register



# register

- ▶ Register variables will be accessed very faster than normal variables



# register

- ▶ Register variables will be accessed very faster than normal variables
- ▶ They are stored in register memory rather than main memory





# register

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- ▶ They are stored in register memory rather than main memory
- ▶ Limited number of variables can be used since register size is very low



# register

- ▶ Register variables will be accessed very faster than normal variables
- ▶ They are stored in register memory rather than main memory
- ▶ Limited number of variables can be used since register size is very low
- ▶ (16 bits, 32 bits or 64 bits)



# Summary



# Summary

We learnt,

- ▶ Storage class specifiers
- ▶ auto keyword
- ▶ static keyword
- ▶ extern keyword
- ▶ register keyword



# Assignment

- ▶ **Write a program, to print the sum of first 5 numbers**
- ▶ **Declare both the keywords auto and static in the program**



# About the Spoken Tutorial Project

- ▶ Watch the video available at [http://spoken-tutorial.org/What\\_is\\_a\\_Spoken\\_Tutorial](http://spoken-tutorial.org/What_is_a_Spoken_Tutorial)
- ▶ It summarises the Spoken Tutorial project
- ▶ If you do not have good bandwidth, you can download and watch it



# Spoken Tutorial Workshops

## The Spoken Tutorial Project Team

- ▶ Conducts workshops using spoken tutorials
- ▶ Gives certificates to those who pass an online test
- ▶ For more details, please write to [contact@spoken-tutorial.org](mailto:contact@spoken-tutorial.org)



# Acknowledgements

- ▶ **Spoken Tutorial Project is a part of the Talk to a Teacher project**
- ▶ **It is supported by the National Mission on Education through ICT, MHRD, Government of India**
- ▶ **More information on this Mission is available at:**

<http://spoken-tutorial.org/NMEICT-Intro>

