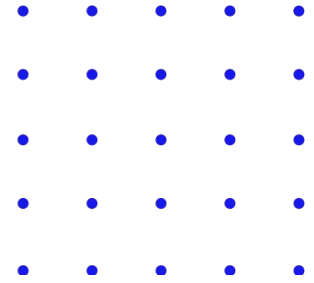


# The integer data type



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# Outlines

- Introduction
- Two bytes unsigned integer types
- Two bytes signed integer types
- Four bytes unsigned integer types
- Four bytes signed integer types

# Introduction

- Integers are data types that stores an integer values only in the memory.
- Integer **size differs** from platform (**microcontroller**) to another.
- The **8-bit** and **16-bit** microcontrollers have integers of **two bytes (16-bit)**.
- The **32-bit** microcontrollers have integers of **four bytes (32-bit)**.
- Three main types for integers, **int**, **short** and **long**.

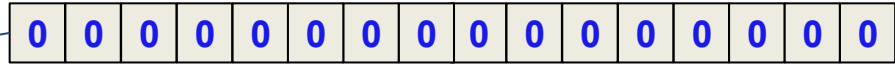
# Two bytes unsigned integer types

- The **unsigned short** and **unsigned int** types:

- Size in memory: **2 bytes/16-bits.**

- Minimum value: **0.**

- Maximum value: **65,535.**



- The **unsigned long** type:

- Size in memory: **4 bytes/32-bits.**

- Minimum value: **0.**

- Maximum value: **4,294,967,296.**

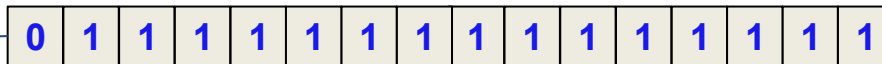
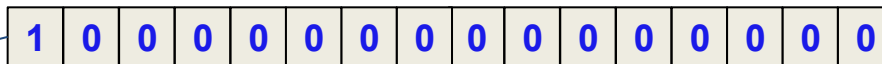
# Two bytes signed integer types

- The **signed short** and **signed int** types:

- Size in memory: **2 bytes/16-bits.**

- Minimum value: **-32,768.**

- Maximum value: **+32,767.**



- The **signed long** type:

- Size in memory: **4 bytes/32-bits.**

- Minimum value: **-2,147,483,648.**

- Maximum value: **+2,147,483,647.**

# Four bytes unsigned integer types

- The **unsigned short** type:
  - Size in memory: **2 bytes/16-bits**.
  - Minimum value: **0**.
  - Maximum value: **65,535**.
- The **unsigned long** and **unsigned int** types:
  - Size in memory: **4 bytes/32-bits**.
  - Minimum value: **0**.
  - Maximum value: **4,294,967,296**.

# Four bytes signed integer types

- The **signed short** type:
  - Size in memory: **2 bytes/16-bits**.
  - Minimum value: **-32,768**.
  - Maximum value: **+32,767**.
- The **signed long** and **signed int** types:
  - Size in memory: **4 bytes/32-bits**.
  - Minimum value: **-2,147,483,648**.
  - Maximum value: **+2,147,483,647**.

# Summary

- You have learned about different integer types used in C.
- You have learned how different architectures control integer sizes.
- You now understand the differences between int, short, and long types in different architectures/platforms.