

Exercise 01

In 1999, a professional standard version of C, known as C99, was defined. Considering the various variable types and their precision presented in the table below, please complete the fourth row of the table with the range of each variable type.

<i>Data type</i>	<i>C99 Data type</i>	<i>Precision</i>	<i>Range</i>
unsigned char	uint8_t	8-bit unsigned	
signed char	int8_t	8-bit signed	
unsigned int		compiler-dependent	
int		compiler-dependent	
unsigned short	uint16_t	16-bit unsigned	
short	int16_t	16-bit signed	
unsigned long	uint32_t	unsigned 32-bit	
long	int32_t	signed 32-bit	
float		32-bit float	
double		64-bit float	

Exercise 02

Write the meanings of each C language punctuation mark in the table below:

<i>Punctuation</i>	<i>Meaning</i>	<i>Punctuation</i>	<i>Meaning</i>
;	Semicolon	{ }	Brace
:	Colon	[]	Brackets
,	Comma	" "	Quotation marks
()	Parentheses	' '	Apostrophe

Exercise 03

a) Write the meaning of each C language operator presented in the following table:

<i>Operation</i>	<i>Meaning</i>	<i>Operation</i>	<i>Meaning</i>
=		+=	
==		=	
!=		&	
<<		^	
>>		%=	
&&		->	
!		&	
~		.	

b) Assume **n** is a signed variable. Assume **m** is an unsigned variable. What does this expression do?
n+m

c) Assume **y** is a signed 8-bit variable. Assume **z** is a signed 32-bit variable. What does this expression do? **y+z**

Exercise 04

Write a C code to evaluate whether a student passes or fails by comparing his score to a cutoff, and declare the corresponding grade as 'Pass' or 'Fail'. Assume the global variable 'Score' is initialized with the numerical value obtained in the course and assign an ASCII letter grade ('P' or 'F') based on a cutoff value of 20.

Exercise 05

Assume **x** and **y** are unsigned variables, and we wish to set **y** to 1 if **x** is even, and set **y** to 0 if **x** is odd. Write two versions: one version with if-then-else and another without if-then-else.

Exercise 06

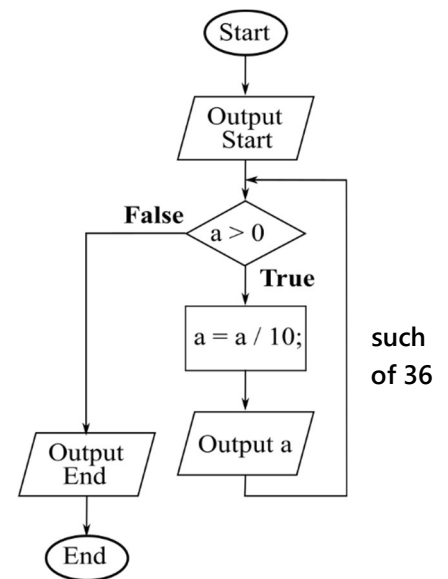
Assume **u1 u2 u3 result** are unsigned variables. Write C code to set **result** to be the median of **u1 u2 u3**. The median of three numbers is the middle value, not the largest, not the smallest, but the middle one.

Exercise 07

Write a C code based on the flowchart in front, using an unsigned integer variable 'a' and a while loop.

Exercise 08

Assume **a b c** are nonzero unsigned variables. Write C code to set **c** to the greatest common divisor, gcd, of **a b**. In other words, find the largest **c** that **c** divides evenly into **a** and divides evenly into **b**. For example the gcd and 24 is 12.



Exercise 09

Write C code that finds the maximum of three signed 32-bit integers using a function that finds the maximum of two signed 32-bit integers.

Exercise 10

Write C code that finds the maximum value in an array using the following prototype of the function Max: `int32_t Max(int32_t group[], int32_t size)`, and return 0 if the array is empty.