Low-level language characteristics 1

Practice 1	
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A program	written in	a low-level	language is	described	as non-por	table. Wha	t does that
mean?							

The program cannot be saved to a disc
The program cannot be copied
The program can only run on one machine
The program can only run on the processor type it was written for





Low-level advantage 1

Cha	llenge

Which o	of these is a advantage of a low-level language compared to a high-level ge?
	They can directly address core hardware components
	They are easier to write programs with
	They are suited to particular problems
	They are easier for humans to understand
Quiz: STEM S 40 (LM	SMART Computer Science Week IC)





Assembly language characteristics 1

Ch	allenge	

	two statements are disadvantages of assembly languages, when compared to evel languages?
	There is no way to implement selection or iteration statements
	Translated programs are not portable between computers with different architectures
	Many lines of code are required to write complex programs
	The programmer cannot add comments to their code
Quiz: STEM 40 (LN	SMART Computer Science Week MC)
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Direct addressing



The following diagram shows the format of a machine code instruction:

Е	Basic Ope	eration		Addressing mode		0	peran	ıd	
0	0	1	1	0	0	1	0	0	1
	ADD				010	001 ₂ =	9 ₁₀		

How many different memory locations can a programmer access using direct addressing?

Quiz:

STEM SMART Computer Science Week 40 (LMC)





Addressing modes



Tony has invented a new assembly language. An instruction in the language is structured as follows:

Opcode, Addressing mode, Operand

Each of the three parts is made up from three bits:

- The LOAD operation's code is 010.
- The possible addressing modes are direct, immediate, and indirect. The code for direct addressing is 001, for immediate addressing is 010, and for indirect addressing is 011.

The part of the main memory that Tony uses looks like this:

Address	Contents
000	010
001	Black Panther
010	Black Widow
011	101
100	Captain Marvel
101	Captain America
110	Thor
111	Hulk

Part A What data will be loaded? 1

What data will be loaded by the instruction 010 001 001?	

Part B	What data will be loaded? 2
What date	will be loaded with the instruction 010 010 011?
Part C	Load data
	d be the instruction to load the data 'Black Widow' using indirect addressing ur answer should be a 9 bit binary number.

Quiz: STEM SMART Computer Science Week 40 (LMC)





Bits for addressing mode

Ch	alleng	e 1

add),	2-bit machine code instruction, 10 bits are used for the fundamental operation (e.g. 2 bits are used for the addressing mode, and 20 bits are used for the operand(s). How different addressing modes can be supported with this structure?	
	2	
) 4	
	8	
	10	
	20	
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High-level vs low-level languages 2

Ch	allenge	

Label the statements below showing the characteristics of low- and high-level programming languages by dragging the correct label into the last column. Answers **can** be used more than once.

Characteristic	Label
Use syntax that is closer to that of human language	
Require specific knowledge of a processor and its operations	
Often used to control specific hardware	
Have built-in libraries that the programmer can call upon	
Easier for humans to learn and follow	
Sometime use a set of mnemonics for key commands	
tems: (High-level) (Low-level)	
Quiz: STEM SMART Computer Science Week	

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40 (AQA)

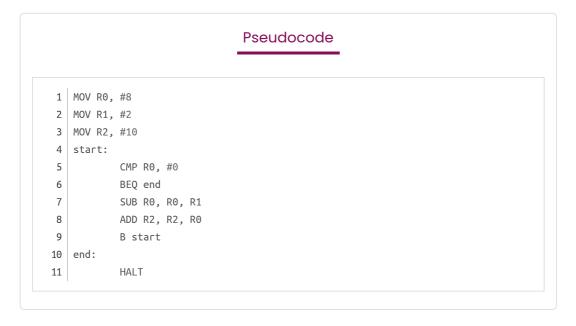


Trace assembly code AQA style 1



Karishma has written a program in assembly language and has given it to her classmates to try out. Trace the program and work out what the **final value of R2** will be at the end of the program.

It may be useful to write down the values of R0, R1 and R2 on paper whilst tracing the program.



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