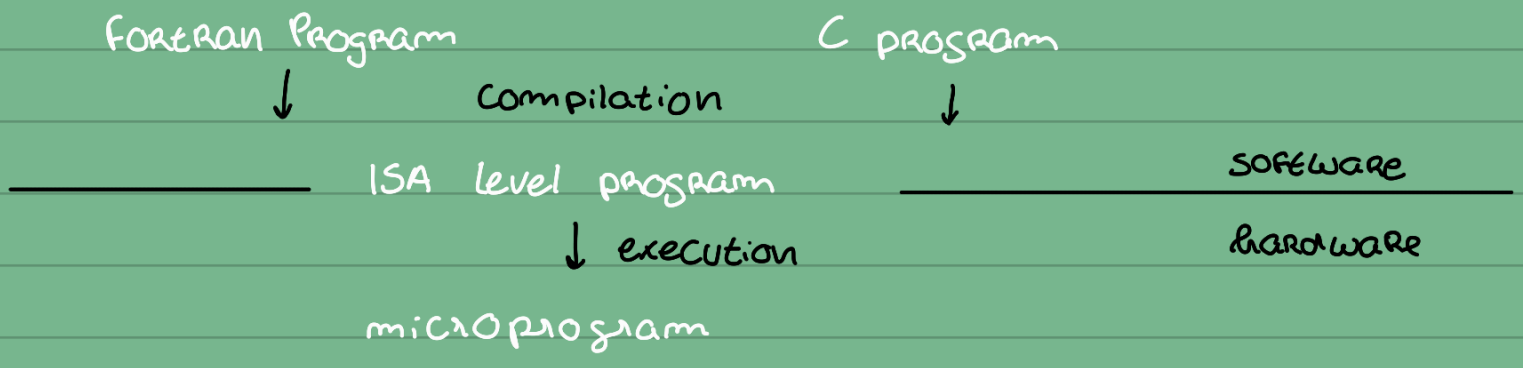
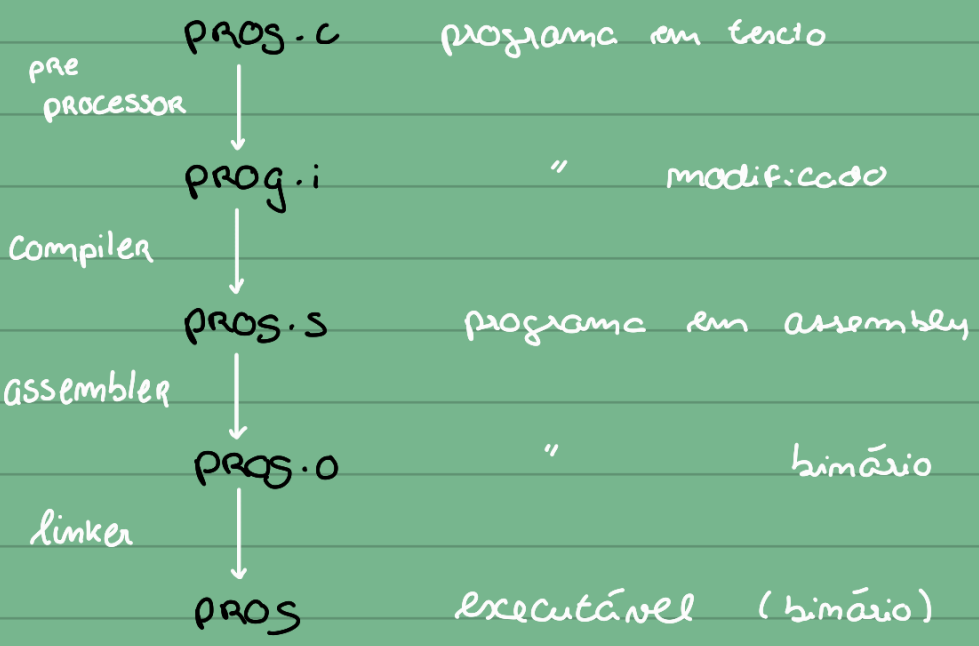
push → sobe 4 unidades e coloca o edx

IA32 instruction-set architecture

Assembly code is very close to the actual ISA-level code that computers execute.
ISA level: interface between the software and hardware



Compilation System:



No preprocessing, o programa em C é modificado de acordo com as instruções que começão com #, por ex. #include <stdio.h>
Se tiver #define MAX 30, cada MAX é substituído por 30 no programa.

Compilation phase - diferentes compiladores geram ficheiros de output c/ a mesma linguagem assembly.

Assembly phase - traduz o ficheiro prog.s em assembly, para linguagem máquina. O formato designa-se relocatable object program. É um ficheiro em binário, cada byte tem as instruções em linguagem máquina.

Linking phase - merge into the program, other modules or standard libraries that are necessary. Por ex. merge do printf.o se o programa usar printf. Gera o a.out.

Loader - utilizado para correr o executável.

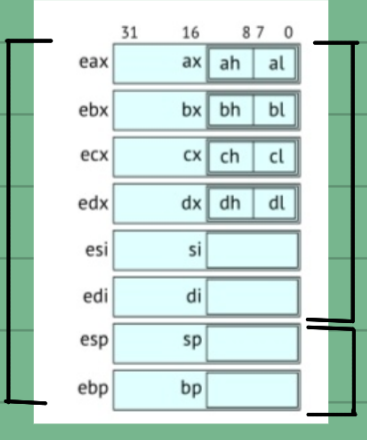
Loading involves: copying to the main memory the machine-level instructions that are saved no executável. Quando loaded, O sistema operativo passa o controlo para o código do programa agora loaded.

IA32 assembly language → machine-oriented language

REGISTERS - 60

O CPU do IA32 contém 8 registers, cada um guarda valores de 32 bits, e apontadores também.

all of them can be accessed as either 16 bits or 32 bits



general-purpose

contain pointers to important places in the stack

eip - instruction pointer

indicate the address in memory of the next instruction to be executed.

Data - Types

word: 16-bit data type

double words: 32-bit quantities

C data type	Intel data type	GAS suffix	size (bytes)
char	Byte	b	1
short	Word	w	2
int	Double word	l	4
unsigned	Double word	l	4
long int	Double word	l	4
unsigned long	Double word	l	4
char *	Double word	l	4

all pointers →

↳ Single-character suffix for instructions to indicate the size, i.g for MOV there are the MOVEB, MOVEW, and MOVL variants.

Syntax follower by the GNU assembler (GAS)

OPERANDS

↳ present in instructions, are used to specify the source values for performing the operation, and the destination location into witch to store the Result.

Imm	constant
Rx	contents of a register
S	Scale (1, 2, 4 or 8)
M[addr]	contents of the memory in the location whose address is given by addr.

Three Major Forms of Operands:

Immediate - for constant values. Can only be used as sources. Const. are written w/ a $ before the int. ($0x1F)

Register - used to denote the contents of one of the registers. is specified w/ a % before it's name

Memory - used to keep locations, according to an address that is calculated. Is viewed as an array of bytes.

The notation M[addr] refers to the value stores in memory starting at address addr.