**ASSEMBLY: - 2**

\* Title : Assembly 2 Project

\* Name : Janki Patel

Graphical user interface, text, application, email

Description automatically generated

ORG $1000

START: ; first instruction of program

\* Put program code here

LEA MESSAGE,A1 ;Loads message into address register a1

MOVE.B #14,D0 ; Moves the number 14 into d0

TRAP #15 ; Display the message variable

MOVE.B #9,D0

TRAP #15 ; halt simulator

\* Put variables and constants here

MESSAGE DC.B 'HELLO WORLD',0

END START ; last line of source

**Please explain how the stack is used for subroutine call and return (Chapter 7 “Stack Instructions” (Maximum 1 point)**

**Ans:** A subroutine call resembles a capacity bring in a more significant level language. A subroutine is a bunch of directions which can be utilized consistently in a program. Just one duplicate of guidance is put away in the memory. At the point when a subroutine is known as the program, control is moved from the fundamental program to the subroutine. At the point when execution of subroutine is done control has returned to the primary program. The stack gives the way to interface the fundamental program to the subroutine. Stack is an information structure which takes a shot at the idea of toward the end in first out.

**Explain a computer's register-level architecture, including: (Maximum 1 point)**

**CPU-memory interface** (Your response to this question should be substantial (minimum **100 words**). The explanations should be written (without copy and paste any graphs or diagrams) **b) special-use registers** (**minimum 100 words**). The explanations should be written (without copy and paste any graphs or diagrams). **c) addressing modes** (**minimum 100 words**). The explanations should be written (without copy and paste any graphs or diagrams).

**Ans :** Central processor memory interface is basic on the grounds that for a CPU to work it ought to have the option to get guidelines from the fundamental memory. In the event that CPU - Memory interface isn't working appropriately it will bring about CPU not accepting and guidelines. This delivers the CPU pointless.

Notwithstanding this interface, there is a requirement for a CPU-Memory interface hardware to deal with their communication. At the point when the CPU needs to play out a peruse or compose activity, it attests either the Read or Write sign and puts the location to be perused from or written to in the MAR register. At that point, the CPU trusts that the memory will complete the mentioned move activity. It is necessitated that the CPU keeps the Read or Write signal set until the memory completes the mentioned activity. The memory enacts the MFC signal when the mentioned activity is finished. One the MFC is set to 1, and afterward the Read or Write sign can be set to 0. This connection cycle between the CPU and memory is called handshaking.

A Special Function Register is a register inside a microchip, which controls or screens different parts of the chip's capacity. Since unique registers are intently attached to some uncommon capacity or status of the processor, they probably won't be legitimately writeable by typical directions, (for example, adds, moves, and so forth) Instances of Special capacity registers are Stack Pointer, Program Counter and so forth

The tending to mode is the technique to indicate the operand of a guidance. The occupation of a chip is to execute a bunch of guidelines put away in memory to play out a particular assignment. Tasks require the accompanying:

The administrator or opcode which figures out what will be done • The operands which characterize the information to be utilized in the activity For instance, on the off chance that we needed to add the numbers 1 and 2 and get an outcome, numerically we would almost certainly compose this as 1 + 2. For this situation, our administrator is (+), or the expansion, and our operands are the numbers 1 and 2. n a microchip, the machine should be advised how to get the operands to play out the activity. The viable location is a term that depicts the location of an operand that is put away in memory. There are a few techniques to assign the powerful location of those operands or get them legitimately from the register. These strategies are known as tending to modes.

**Citations:**

sadiasadia 70544 gold badges1111 silver badges1717 bronze badges, et al. “What Is Special Purpose Register?” *Stack Overflow*, 1 July 1961, <https://stackoverflow.com/questions/5840055/what-is-special-purpose-register>.

“Addressing Mode.” *Wikipedia*, Wikimedia Foundation, 30 Sept. 2019, <https://en.wikipedia.org/wiki/Addressing_mode>.

AnzarAlimCheck out this Author's contributed articles., et al. “Subroutine, Subroutine Nesting and Stack Memory.” *GeeksforGeeks*, 11 Dec. 2018, <https://www.geeksforgeeks.org/subroutine-subroutine-nesting-and-stack-memory/>.