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| Data Dictionary for  main.c |
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# The SimpleTron

The SimpleTron is a machine for entering and running programs written in SML (Simple Machine Language), which has similarities with Assembly Languages. SML programs are entered into a Virtual Memory space by the user either from the keyboard one line at a time, or by loading them from a file with an .sml suffix. The SimpleTron allows users to enter, run programs, and write out the contents of the Registers and Virtual Memory to the Screen or a Dump File.

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| **mainMenu()** | | |
| **Name** | **Type** | **Description** |
| choice | char | Used to get the users choice from the menu options available. |
| showMenu | int | Used as a flag to keep showing the menu until the user chooses to quit. |
| CLEARSCREEN |  | Used to call a System function which clears the terminal screen. Defined in SimpleTron.h. |
| PAUSE |  | Used to call a System function which pauses the running of the program until the user presses a key. Defined in SimpleTron.h. |
| MENU |  | A string literal used to display the main menu. Defined in SimpleTron.h. |
| OPCDODELIST |  | A string literal used to display a list of SML OPCodes Defined in SimpleTron.h. |

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| **getInteger()** | | |
| **Name** | **Type** | **Description** |
| input | char[] | Used to hold the user’s input before it is converted to an integer |
| result | int | Used to hold the converted input, and is the return value of this function. |
| validInt | int | Used as a flag to indicate that the user has entered a valid integer value. It is set by the return value of the sscanf function which shows the number of conversions made. |
| WORDLENGTH |  | Used to restrict the length of the user’s input string. Defined in SimpleTron.h |

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| **getDouble()** | | |
| **Name** | **Type** | **Description** |
| input | char[] | Used to hold the user’s input before it is converted to a double. |
| result | int | Used to hold the converted input, and is the return value of this function. |
| validDouble | int | Used as a flag to indicate that the user has entered a valid double value. It is set by the return value of the sscanf function which shows the number of conversions made. |
| MAXFLOATLEN |  | Used to restrict the length of the user’s input string.  Defined in SimpleTron.h |

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| **reconstructDouble()** | | |
| **Name** | **Type** | **Description** |
| reconstructed | double | Used to hold the double value whilst it is reconstructed from the memory locations containing its righ and left-hand sides and is the return value of this function. |

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| **clearMemory()** | | |
| **Name** | **Type** | **Description** |
| i | int | Used when iterating through, and resetting the memory locations to zero. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **addInstructionToMemory()** | | |
| **Name** | **Type** | **Description** |
| i | int | Used when iterating through, and resetting the memory locations to zero. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **loadProgram()** | | |
| **Name** | **Type** | **Description** |
| address | int | Used to hold the current Memory address ebeing written to by the user. |
| input | int | Used to hold the instructions/values input by the user. |
| isValidLoad | int | Used as the return value of the function. It is set to 1 if the program was entered correctly into memory, otherwise -1. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |
| PAUSE |  | Used to call a System function which pauses the running of the program until the user presses a key. Defined in SimpleTron.h. |

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| **loadCodeFromFile()** | | |
| **Name** | **Type** | **Description** |
| address | int | Used to hold the Memory address where the instruction will be loaded into memory after it is read in from the file. |
| instruction | int | Used to hold the instruction to be loaded into memory after it is read in from the file. |
| validLine | int | Used as aq flag to indicate that a valid Memory address and Instruction have been loaded from the file, and can be written to the Virtual Memory. |
| line | char [] | Used to hold each line as it is read in from the file to be tokenised. |
| linePtr | char \* | Used to provide a pointer to the line array as this is required by strtok. |
| tokenNumber | size\_t | Used as a flag to determine whether the current token being processed is an address or an instruction. |
| tokenPtr | char \* | Used to hold the pointer returned to a token by strtok. |
| filename | char [] | Used to hold the name of the SML source file to be loaded into memory. |
| sourceFilePtr | FILE \* | Used to hold a file pointer to the SML source file being loaded into memory. |
| CLEARSCREEN |  | Used to call a System function which clears the terminal screen. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |
| LINELENGTH |  | Used to define the maximum length of a line read in from file to the line array. Defined in SimpleTron.h. |

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| **dumpMemoryAndRegistersToFile()** | | |
| **Name** | **Type** | **Description** |
| i | int | Used to iterate in several different for loops. |
| value | int | Used to hold the value stored at a ememory address before it is written out to the dump file. |
| row | int | Used to hold the row numbers written out to file to make the memory instructions easier to find. |
| filename | char [] | Used to hold the file to dump the contents of the Registers and Memory to. |
| ofPtr | FILE \* | Used to hold a file pointer to the dump file whilst it is being written. |
| ACCUMULATOR | int | The value currently contained in the integer Accumulator. Defined in SimpleTron.h. |
| FLTACCUMULATOR | float | The value currently contained in the float Accumulator. Defined in SimpleTron.h. |
| INSTRUCTIONCOUNTER | int | The address of the last instruction executed. Defined in SimpleTron.h. |
| INSTRUCTIONREGISTER | int | The last instruction executed. Defined in SimpleTron.h. |
| OPERATIONCODE | int | The OpCode executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the last OpCode executed. Defined in SimpleTron.h. |
| CLEARSCREEN |  | Used to call a System function which clears the terminal screen. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **dumpMemoryAndRegistersToScreen()** | | |
| **Name** | **Type** | **Description** |
| i | int | Used to iterate in several different for loops. |
| value | int | Used to hold the value stored at a ememory address before it is written out to the dump file. |
| row | int | Used to hold the row numbers written out to file to make the memory instructions easier to find. |
| ACCUMULATOR | int | The value currently contained in the integer Accumulator. Defined in SimpleTron.h. |
| FLTACCUMULATOR | float | The value currently contained in the float Accumulator. Defined in SimpleTron.h. |
| INSTRUCTIONCOUNTER | int | The address of the last instruction executed. Defined in SimpleTron.h. |
| INSTRUCTIONREGISTER | int | The last instruction executed. Defined in SimpleTron.h. |
| OPERATIONCODE | int | The OpCode executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the last OpCode executed. Defined in SimpleTron.h. |
| CLEARSCREEN |  | Used to call a System function which clears the terminal screen. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **runProgram()** | | |
| **Name** | **Type** | **Description** |
| programState | int | Used as a flag to determine if the program is still executing (1), and whether it executed correctly (0), or terminated abnormally ( any other value). |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |

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| **loadInstruction()** | | |
| **Name** | **Type** | **Description** |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| INSTRUCTIONREGISTER | int | The instruction being executed. Defined in SimpleTron.h. |
| OPERATIONCODE | int | The OpCode being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **processInstruction()** | | |
| **Name** | **Type** | **Description** |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERATIONCODE | int | The OpCode being executed. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| READ |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| WRITE |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| NEWLINE |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| READFLOAT |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| WRITEFLOAT |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| READSTRING |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| WRITESTRING |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| LOAD |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| STORE |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| LOADFLOAT |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| STOREFLOAT |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| ADD |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| SUBTRACT |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| DIVIDE |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| MULTIPLY |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| MODULUS |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| EXPONENTIATION |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| ADDFLOAT |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| SUBTRACTFLOAT |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| DIVIDEFLOAT |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| MULTIPLYFLOAT |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| MODULUSFLOAT |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| BRANCH |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| BRANCHNEG |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| BRANCHZERO |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| BRANCHPOS |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |
| HALT |  | The value of an OPCode. It is used to switch to a function creating the necessary instructions for the specified operation. Defined in SMLOpCodes.h |

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| **doRead()** | | |
| **Name** | **Type** | **Description** |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doWrite()** | | |
| **Name** | **Type** | **Description** |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doNewLine()** | | |
| **Name** | **Type** | **Description** |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |

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| **doReadFloat()** | | |
| **Name** | **Type** | **Description** |
| sides | Int [] | Used to hold the Left-hand and Right-hand sides of the float to be written to separate memory locations. |
| f | float | Used to hold the float input from STDIN. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doWriteFloat()** | | |
| **Name** | **Type** | **Description** |
| sides | Int [] | Used to hold the Left-hand and Right-hand sides of the float stored in separate memory locations before it is reconstructed. |
| f | float | Used to hold the float, reconstructed from its Left-hand and Right-hand sides, to be written to STDOUT. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doReadString()** | | |
| **Name** | **Type** | **Description** |
| input | char [] | Used to hold the string entered on STDIN. |
| strSize | int | Used to hold the length of the string entered on STDIN. |
| i | int | Used to iterate through the input string whilst storing it to memory. |
| temp | int | Used first to add the length of the string to its first location in memory, then the characters of the string which are stored as half-words. |
| address | int | Used to add the string characters to sequential locations in memory. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |
| MAXSTRINGLEN |  | Used to restrict the number of characters which can be entered during the reading in of strings. Defined in SimpleTron.h. |

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| **doWriteString()** | | |
| **Name** | **Type** | **Description** |
| input | char [] | Used to hold the string entered on STDIN. |
| strSize | int | Used to hold the length of the string entered stored in memory. |
| first | int | Used to hold the first characters of the string stored in memory |
| i | int | Used to iterate through the input string whilst reading it from memory. |
| temp | int | Used hold characters stored as half-words in memory. |
| temp1 | int | Used to hold characters from memory after conversion from half-words. |
| address | int | Used to read the string from to sequential locations in memory. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |
| MAXSTRINGLEN |  | Used to restrict the number of characters which can be entered during the reading in of strings. Defined in SimpleTron.h. |

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| **doLoad()** | | |
| **Name** | **Type** | **Description** |
| ACCUMULATOR | int | The integer Accumulator where the value from the memory address in OPERAND will be loaded. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doStore()** | | |
| **Name** | **Type** | **Description** |
| ACCUMULATOR | int | The integer Accumulator containing the value which will be stored in the memory address in OPERAND. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doLoadFloat()** | | |
| **Name** | **Type** | **Description** |
| FLTACCUMULATOR | int | The float Accumulator where the value from the memory address in OPERAND will be loaded. Defined in SimpleTron.h. |
| sides | Int [] | Used to hold the Left-hand and Right-hand sides of the float stored in separate memory locations before it is reconstructed. |
| f | float | Used to hold the float, reconstructed from its Left-hand and Right-hand sides, to be loaded into the float Accumulator. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doStoreFloat()** | | |
| **Name** | **Type** | **Description** |
| FLTACCUMULATOR | int | The float Accumulator containing the value which will be stored the memory address in OPERAND. Defined in SimpleTron.h. |
| sides | Int [] | Used to hold the Left-hand and Right-hand sides of the float to be stored in separate memory locations. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doAdd()** | | |
| **Name** | **Type** | **Description** |
| ACCUMULATOR | int | The integer Accumulator to add the value stored in the memory address in OPERAND to. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doSubtract()** | | |
| **Name** | **Type** | **Description** |
| ACCUMULATOR | int | The integer Accumulator to subtract the value stored in the memory address in OPERAND from. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doDivide()** | | |
| **Name** | **Type** | **Description** |
| ACCUMULATOR | int | The integer Accumulator to be divided by the value stored in the memory address in OPERAND. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doMultiply()** | | |
| **Name** | **Type** | **Description** |
| ACCUMULATOR | int | The integer Accumulator to multiply by the value stored in the memory address in OPERAND. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doModulus()** | | |
| **Name** | **Type** | **Description** |
| ACCUMULATOR | int | The integer Accumulator to modulo by the value stored in the memory address in OPERAND. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doExponentiation()** | | |
| **Name** | **Type** | **Description** |
| ACCUMULATOR | int | The integer Accumulator to raise to the power of the value stored in the memory address in OPERAND. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| i | int | Used to hold the power top raise the number in the integer Accumulator to, |
| original | int | Holds the original value stored in the integer Accumulator, used in calculating its exponentiated value. |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doAddFloat()** | | |
| **Name** | **Type** | **Description** |
| FLTACCUMULATOR | int | The float Accumulator to add the value stored in the memory address in OPERAND to. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| sides | Int [] | Used to hold the Left-hand and Right-hand sides of the float stored in separate memory locations before it is reconstructed. |
| f | float | Used to hold the float which will be added to the float Accumulator. |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doSubtractFloat()** | | |
| **Name** | **Type** | **Description** |
| FLTACCUMULATOR | int | The float Accumulator to subtract the value stored in the memory address in OPERAND from. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| sides | Int [] | Used to hold the Left-hand and Right-hand sides of the float stored in separate memory locations before it is reconstructed. |
| f | float | Used to hold the float which will be subtracted from the float Accumulator. |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doDivideFloat()** | | |
| **Name** | **Type** | **Description** |
| FLTACCUMULATOR | int | The float Accumulator to be divided by the value stored in the memory address in OPERAND. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| sides | Int [] | Used to hold the Left-hand and Right-hand sides of the float stored in separate memory locations before it is reconstructed. |
| f | float | Used to hold the float which the value in the float Accumulator will be divided by. |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doMultiplyFloat()** | | |
| **Name** | **Type** | **Description** |
| FLTACCUMULATOR | int | The float Accumulator to multiply by the value stored in the memory address in OPERAND. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| sides | Int [] | Used to hold the Left-hand and Right-hand sides of the float stored in separate memory locations before it is reconstructed. |
| f | float | Used to hold the float which the value in the float Accumulator will be multiplied by. |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doModulusFloat()** | | |
| **Name** | **Type** | **Description** |
| FLTACCUMULATOR | int | The float Accumulator to modulo by the value stored in the memory address in OPERAND. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| sides | Int [] | Used to hold the Left-hand and Right-hand sides of the float stored in separate memory locations before it is reconstructed. |
| f | float | Used to hold the float which the value in the float Accumulator will be moduloed by. |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |
| MEMORY |  | The integer array which is used as the Virtual Memory of the SimpleTron. Defined in SimpleTron.h. |

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| **doBranch()** | | |
| **Name** | **Type** | **Description** |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address to branch to. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |

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| **doBranchNeg()** | | |
| **Name** | **Type** | **Description** |
| ACCUMULATOR | int | The integer Accumulator. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |

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| **doBranchZero()** | | |
| **Name** | **Type** | **Description** |
| ACCUMULATOR | int | The integer Accumulator. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |

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| **doBranchPos()** | | |
| **Name** | **Type** | **Description** |
| ACCUMULATOR | int | The integer Accumulator. Defined in SimpleTron.h. |
| PAUSE |  | Used to pause the running of the program. Defined in SimpleTron.h |
| INSTRUCTIONCOUNTER | int | The address of the instruction being executed. Defined in SimpleTron.h. |
| OPERAND | int | The Memory Address attached in the instruction containing the OpCode being executed. Defined in SimpleTron.h. |
| MEMORYSIZE |  | The number of Memory addresses in the Virtual Memory. Defined in SimpleTron.h. |