ASSIGNMENT (22/11/2021)

Q.1) In the syntax analyzer phase of the compiler, the parser generates the abstract syntax tree (condensed form of the parse tree). This abstract syntax tree needs to be converted into machine understandable format using the intermediate code generator. Write a program in C to convert the given abstract syntaxes into their equivalent machine codes.

The following specific machine instruction sets may be considered:

Following argument types may be used:

R → specifies a register in the form R0, R1, R2, etc.

L → specifies a numerical label.

V → specifies a `variable location' pointed to by a register.

A → specifies a constant value.

The instruction set may be defined as follows:

LOAD A,R → loads the integer value specified by A into register R.

STORE R,V → stores the value in register R to variable V.

OUT R → outputs the value in register R.

ADD A,R → adds the value specified by A to register R.

SUB A,R → subtracts the value specified by A from register R.

MUL A,R → multiplies the value specified by A by register R.

DIV A,R → divides register R by the value specified by A.

STOP → stops execution of the machine.

Example:

Input: = t3 99

Output: STORE t3, 99

Input may be considered as:

```
= t1 2
[]= a 0 1
[]= a 1 2
[]= a 2 3
*t1 6 t2
+ a[2] t2 t3
- a[2] t1 t2
/ t3 t2 t2
print t2
```