INTRODUCTION

The first step to designing any engineering solution is to define the problem well. The definition of the problem, its constraints, and the procedure to carry out its solution should all be defined before beginning construction (or in this case, programming).

An effective method to approach the development of a robot program is to treat its procedure as an algorithm.

WHAT IS AN ALGORITHM?

An algorithm is a finite sequence of well-defined instructions which brings a precondition state to a postcondition state.

-DEFINE THE PROBLEM (PRECONDITION, POSTCONDITION)

It is effective to approach the programming of a FANUC robot as the algorithm of a computer. The algorithm of a computer may be defined as a precondition, postcondition, and a procedure to bridge the two. That is to say, to program a FANUC robot, first outline a precondition and postcondition, then outline a procedure to reach the postcondition from the precondition.

The precondition and postcondition may be written at the top of each program.

[In the example of SWAP\_CYLNDRS]

-DEFINE THE PROCEDURE (WRITE A TEXTUAL DESCRIPTION OF THE ALGORITHM)

The definition of the procedure of a FANUC machine should be defined as a series of actions which interact with the items outlined in the precondition. At the end of this algorithm, the items defined in the precondition should be in the state defined by the postcondition. The procedure should be described as a collection of single actions.

As you define the procedure, consider similar and repeated steps of the procedure which may be compiled to a collection of smaller procedures which may be defined as an implementation outside of the main program such as a macro, another program, or a position register. These may be called from the main program to simplify the main file and minimize programming time.

The procedure may be written in the program.

[example of SWAP\_CYLNDRS]

-TEACH RELEVANT FRAMES

(MENU > SETUP > Frames)

There are Tool Frames and User Frames that are expected by every point the TP records in a program. If the wrong Tool or User frame is active when a program requests that the robot moves to a point, the robot will not move to that point and will instead throw error INTP-253.

To ensure that the correct frames are active when a program is run, the first few lines of our program can set the active User and Tool Frames directly.

[example of SWAP\_CYLNDRS]

-TEACH ALGORITHM

Once the algorithm is well defined, an outline is written, and relevant frames are prepared, a programmer may be confident in teaching the algorithm to the robot. Under each step defined by the algorithm, a programmer may place the code which performs that step. This ensures that another developer may follow the logic behind the program and expand upon it in the future.

[example of SWAP\_CYLNDRS]

… refined and continued in SWAP\_CYLNDRS Development Guide