# (6) MACRO FACILITY

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*** MACRO VARIABLES;

        * Manage Macro Variables;

                %let <macro_var1>=<value1>;

                %symdel <macro_var1> <macro_var2> ...;

        * List Macro Variables;

                %put _automatic_;

                %put _user_;

                %put _all_;

            * List All Macro Variables;

                %macro putall;
                    proc sql flow;
                        select name, value
                            from dictionary.macros
                            where scope='GLOBAL'
                            order by name;
                    quit;
                %mend;
                    %putall

            * Delete All Macro Variables;

                %macro deleteall;
                    proc sql noprint;
                        select name into : vars separated by ' '
                            from dictionary.macros
                            where scope='GLOBAL';
                    quit;
                    %symdel &vars;
                %mend;
                    %deleteall

        * Reference Macro Variable;

                data teams_warm teams_cool teams_neut;
                    set teams;
                    %let teams_warm=('Red','Orange','Yellow');
                    %let teams_cool=('Green','Blue','Purple');
                        select (team);
                            when &teams_warm output teams_warm;
                            when &teams_cool output teams_cool;
                            otherwise output teams_neut;
                        end;

        * Global vs Local Symbol Tables;

                %macro definition();
                    %let <macro_var1>=<macro_val1>;
                    <data step call symputx routine>;
                    <proc sql into clause>;
                %mend;
```

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*** MACRO FUNCTIONS;

        * Macro Versions of Functions;

                %scan(<&macro_var1>,<position>,<n>);

                %substr(<&macro_var1>,<i>,<dlm>);

        * Macro-Only Functions;

                %eval(<arithmetic/logical expression>);

                %sysfunc(<function(<&macro_var1>)>,<format>);

                %str(<argument>);

                %nrstr(<argument>);

*** MACRO DEFINITIONS;

        * Positional Parameters;

                %macro <macro_name>(<macro_parameters>);
                    <macro_text and &macro_parameters>;
                %mend;
                    %macro_name(<arguments>)

        * Keyword Parameters;

                %macro <macro_name>(<macro_parameter=argument>);
                    <macro_text and &macro_parameters>;
                %mend;
                    %macro_name(<macro_parameter=argument>)

*** RUNTIME VARIABLES;

        * Runtime Creation;

                call symputx('<macro_var1>',<expression>);

                call symputx('<macro_var1>',put(<expression>,zW.d);

                call symputx(<expression>,<expression>);

        * Indirect Reference;

                &&&<macro_var1> resolves to &<macro_val1>

                &&<macro_var1>&<macro_var2> resolves to &<macro_val1-macro_val2>;

        * Runtime Reference;

                symget('<macro_var1>');

                symget(<expression>);
```