



# SAS<sup>®</sup> Macro Language 1: Essentials

Lesson Quizzes

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## **SAS® Macro Language 1: Essentials – Lesson Quizzes**

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Course code MC1V2LQ, prepared date 03Aug2022.

MC1V2LQ\_001

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# 1.1 Quizzes

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## Lesson 2 – SAS Macro Facility

1. Which of the following is **not** a benefit of using the SAS macro facility?
  - a. The macro facility enables you to reduce the amount of text that you must enter in your programs.
  - b. The macro facility enables you to write programs that are easily modified and customized.
  - c. The macro facility enables you to easily and automatically reference system information in your programs.
  - d. Code that is generated using macro techniques compiles and executes faster than other SAS code.

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2. True or False: Automatic and user-defined macro variables can store only text strings.
  - a. True
  - b. False

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3. Which of the following TITLE statements correctly references the macro variable month?

- a. `title 'Total Sales for &month';`
- b. `title "Total Sales for 'month'";`
- c. `title "Total Sales for &month";`
- d. `title "Total Sales for %month";`

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4. Which statement creates a macro variable named **Location** that has the value *storage*?

- a. `&let location=storage;`
- b. `let &location=storage;`
- c. `%let location="storage";`
- d. `%let location=storage;`

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5. Which of the following statements does **not** correctly display the value of the macro variable **Month** in the SAS log?
- a. `%put (month) ;`
  - b. `%put &month;`
  - c. `%put &=month;`
  - d. `%put The value of macro variable month is &month;`

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6. How many tokens are in this statement?

```
plot date*revenue='$' / vref='30jun2002'd;
```

- a. 11
- b. 12
- c. 13
- d. 18

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7. Which option displays the resolved values of macro variables in the log?
- a. %LET
  - b. MPRINT
  - c. MACVAR
  - d. SYMBOLGEN

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8. True or False: The macro processor modifies SAS code after it is compiled.
- a. True
  - b. False

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9. Which of the following describes the stages of program flow for a SAS program with no macro triggers?
- a. Compiler ⇒ Input Stack ⇒ Word Scanner
  - b. Input Stack ⇒ Compiler ⇒ Word Scanner
  - c. Input Stack ⇒ Word Scanner ⇒ Compiler
  - d. Word Scanner ⇒ Compiler ⇒ Input Stack

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10. Which of these will not be sent to the macro processor?

- a. **&name**
- b. **' &name '**
- c. **%name**
- d. **"%name"**

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## Lesson 3 – Storing and Processing Text

1. Assume that you began your SAS session today. Which of the following statements correctly sets the macro variable **CurrDate** to today's date, expressed as a calendar date?
  - a. `%let currdate = %sysfunc(today(), worddate.);`
  - b. `%let currdate = %sysfunc(today());`
  - c. `%let currdate = today();`

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2. Which of the following correctly converts the value of the macro variable **Last\_Name** to proper case?
  - a. `%let last_name=%propcase(last_name);`
  - b. `%let last_name=%propcase(&last_name);`
  - c. `%let last_name=%sysfunc(propcase(last_name));`
  - d. `%let last_name=%sysfunc(propcase(&last_name));`

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3. Which of the following %LET statements correctly assigns the value *Director's Report* to the macro variable **Text**?
- a. `%let text=Director's Report;`
  - b. `%let text=%str(Director's Report);`
  - c. `%let text=%str(Director%'s Report);`
  - d. `%let text=%nrstr(Director's Report);`

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4. Which technique does not create macro variables at execution time?
- a. %LET statement
  - b. SYMPUTX routine
  - c. SQL INTO clause

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5. Which of the following correctly creates a macro variable in a PROC SQL step?

a. 

```
select fee format=dollar8.
      into :daily_fee
      from sasuser.all;
```

b. 

```
select fee format=dollar8.
      into daily_fee
      from sasuser.all;
```

c. 

```
if location='Boston' then do;
      call symputx('region', East);
end;
```

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6. Which SQL query assigns the values of the variable **Course\_Code** to the macro variables **Code1** through **Code3** and the values of the data set variable **Location** to the macro variables **Loc1** through **Loc3**?

a. 

```
select course_code, location
      into: code1-code3, loc1-loc3
      from schedule;
```

b. 

```
select course_code into :code1-:code3,
      location into :loc1-:loc3
      from schedule;
```

c. 

```
select course_code, location
      into :code1-:code3, :loc1-:loc3
      from schedule;
```

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7. Which set of statements creates a macro variable named **region** and assigns the value of the data set column **Location**?

a. 

```
if location='Boston' then do;
    call symputx('region', 'Location');
end;
```

b. 

```
if location='Boston' then do;
    %let region=Location;
end;
```

c. 

```
if location='Boston' then do;
    call symputx('region', Location);
end;
```

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8. Which CALL statement correctly creates a macro variable from the result of the numeric expression **amount/number** so that the macro variable shows the value with a dollar sign and no decimal places?

a. `call symputx('avg', amount/number);`

b. `call symputx('avg', amount/number(dollar8.));`

c. `call symputx('avg', put(amount/number, dollar8.));`

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9. Which of the following statements about macro variable resolution is false?
- a. Two consecutive ampersands resolve to one ampersand.
  - b. If more than two consecutive ampersands precede a name token, the macro processor generates an error message.
  - c. The macro processor always rescans a reference that is preceded by multiple ampersands.
  - d. Rescanning continues until there are no remaining macro triggers that the macro processor can resolve.

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10. Given the global symbol table shown here, what value does **&&teach&crs** resolve to?
- a. &teach3
  - b. teach3
  - c. Forest, Debra
  - d. none of the above

Global Symbol Table

Name	Value
TEACH1	Hallis, George
TEACH2	Wickham, Alice
TEACH3	Forest, Debra
CRS	3

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## Lesson 4 – Working with Macro Programs

1. Which of the following is true?
  - a. A %MACRO statement must always be paired with a %END statement.
  - b. A macro definition can include macro variable references, but it cannot include SAS language statements.
  - c. Only macro language statements are checked for syntax errors when the macro is compiled.
  - d. The MPRINT system option writes a message to the log indicating whether a macro compiles successfully.

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2. Which statement concerning macro parameters is false?
  - a. Parameter names and values are inside parentheses and are comma delimited.
  - b. The order of positional parameter names in a macro definition must match the order of parameter values in a macro call.
  - c. Keyword parameters are assigned a default value after an equal sign.
  - d. Keyword parameters must be listed before positional parameters in a mixed parameter list.

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3. If this program is run in a new SAS session, how many macro variable/value combinations are displayed in the log?
- a. 1
  - b. 2
  - c. 3
  - d. cannot be determined

```
%macro test(y);  
  %let x=y;  
  %put _local_;  
%mend test;  
%test(5)
```

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4. When this program ends execution, what is the value of X?
- a. 0
  - b. 5
  - c. cannot be determined

```
%macro inner;  
  %let x=&y;  
%mend inner;  
%macro outer(y);  
  %inner  
%mend outer;  
%let x=0;  
%outer(5)
```

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5. Which of the following can be conditionally placed onto the input stack?
- a. only whole steps
  - b. only whole steps or whole statements
  - c. only whole statements or pieces of text within a statement
  - d. whole steps, whole statements, or pieces of text within statements

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6. Which system option can you use to monitor macro execution?
- a. MLOGIC
  - b. MPRINT
  - c. SYMBOLGEN
  - d. MCOMPILENOTE=ALL

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7. Which of the following **reports** macro definitions runs the **weekly** macro if the day of the week is *Friday*?

a. 

```
%macro reports;  
  %daily  
  %if &sysday=Friday %then %weekly;  
%mend reports;
```

b. 

```
%macro reports;  
  %daily  
  %if &sysday=Friday %then %do %weekly;  
%mend reports;
```

c. 

```
%macro reports;  
  %daily  
  %if &sysday="Friday" %then %weekly;  
%mend reports;
```

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8. Which statement correctly checks that the value of the macro variable **Var** is not in the following list: *AU CA DE US*?

- a. 

```
%if &var not in AU CA DE US;
```
- b. 

```
%if not &var in AU CA DE US;
```
- c. 

```
%if not (&var in AU CA DE US);
```
- d. 

```
%if &var is not in (AU CA DE US);
```

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9. Which %DO statement does not contain a syntax error?

- a. `%do i=1 to 5;`
- b. `%do %until(&X > 10);`
- c. `%do %while &X < 10;`
- d. `%do i=A, B, C;`

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10. Which expression in a macro %DO loop writes the following messages to the log?

- a. `%put City&i is &Cityi;`
- b. `%put City&i is &City&i;`
- c. `%put City&i is &City&&i;`
- d. `%put City&i is &&City&i;`

```
City1 is London
City2 is Tokyo
City3 is Buenos Aires
City4 is Toronto
```

Local Symbol Table

Name	Value
CITY1	London
CITY2	Tokyo
CITY3	Buenos Aires
CITY4	Toronto
SQLOBS	4

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## Lesson 5 – Developing Macro Applications

1. When a macro is compiled, it is stored in which location by default?
  - a. SASAUTOS
  - b. work.sasmacr
  - c. MAUTOSTORE
  - d. sasuser.macros

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2. Which statement specifies autocall library locations, including autocall macros supplied by SAS and user-defined macros?
  - a. `sasmstore=(sasautos, s:/workshop);`
  - b. `options sasautos=("s:/workshop", sasautos);`
  - c. `%autocall(sasautos, s:/workshop)`
  - d. `autocall sasautos=("s:/workshop", sasautos);`

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3. True or False: When an autocall macro is called, it is stored permanently as a compiled macro in a macro catalog until you delete it.
- a. True
  - b. False

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4. Which statement ensures that the **Name** parameter value is in uppercase?
- a. `%let &Name=uppercase (Name) ;`
  - b. `%let &Name=uppercase (&Name) ;`
  - c. `%let Name=%uppercase (&Name) ;`
  - d. `%let Name=%uppercase (Name) ;`

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5. Which %IF expression is true if the **Input** parameter value is A?

```
%macro report(input);  
...  
%mend report;  
  
%report(A)
```

- a. %if &input=A or B %then %do;
- b. %if &input in A B %then %do;
- c. %if &input in('A', 'B') %then %do;
- d. none of the above

# 1.2 Solutions

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## Lesson 2

1. Which of the following is **not** a benefit of using the SAS macro facility?
  - a. The macro facility enables you to reduce the amount of text that you must enter in your programs.
  - b. The macro facility enables you to write programs that are easily modified and customized.
  - c. The macro facility enables you to easily and automatically reference system information in your programs.
  - d. Code that is generated using macro techniques compiles and executes faster than other SAS code.

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2. True or False: Automatic and user-defined macro variables can store only text strings.
  - a. True
  - b. False

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3. Which of the following TITLE statements correctly references the macro variable month?

- a. `title 'Total Sales for &month';`
- b. `title "Total Sales for 'month'";`
- c. `title "Total Sales for &month";`
- d. `title "Total Sales for %month";`

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4. Which statement creates a macro variable named **Location** that has the value *storage*?

- a. `&let location=storage;`
- b. `let &location=storage;`
- c. `%let location="storage";`
- d. `%let location=storage;`

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5. Which of the following statements does **not** correctly display the value of the macro variable **Month** in the SAS log?

- a. `%put (month) ;`
- b. `%put &month;`
- c. `%put &=month;`
- d. `%put The value of macro variable month is &month;`

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6. How many tokens are in this statement?

```
plot date*revenue='$' / vref='30jun2002'd;
```

- a. 11
- b. 12
- c. 13
- d. 18

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7. Which option displays the resolved values of macro variables in the log?

- a. %LET
- b. MPRINT
- c. MACVAR
- d. SYMBOLGEN

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8. True or False: The macro processor modifies SAS code after it is compiled.

- a. True
- b. False

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9. Which of the following describes the stages of program flow for a SAS program with no macro triggers?
- a. Compiler ⇒ Input Stack ⇒ Word Scanner
  - b. Input Stack ⇒ Compiler ⇒ Word Scanner
  - c. Input Stack ⇒ Word Scanner ⇒ Compiler
  - d. Word Scanner ⇒ Compiler ⇒ Input Stack

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10. Which of these will not be sent to the macro processor?
- a. **&name**
  - b. **' &name '**
  - c. **%name**
  - d. **"%name"**

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## Lesson 3

1. Assume that you began your SAS session today. Which of the following statements correctly sets the macro variable **CurrDate** to today's date, expressed as a calendar date?

- a. `%let currdate = %sysfunc(today(), worddate.);`
- b. `%let currdate = %sysfunc(today());`
- c. `%let currdate = today();`

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2. Which of the following correctly converts the value of the macro variable **Last\_Name** to proper case?

- a. `%let last_name=%propcase(last_name);`
- b. `%let last_name=%propcase(&last_name);`
- c. `%let last_name=%sysfunc(propcase(last_name));`
- d. `%let last_name=%sysfunc(propcase(&last_name));`

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3. Which of the following %LET statements correctly assigns the value *Director's Report* to the macro variable **Text**?
- a. `%let text=Director's Report;`
  - b. `%let text=%str(Director's Report);`
  - c. `%let text=%str(Director%'s Report);`
  - d. `%let text=%nrstr(Director's Report);`

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4. Which technique does not create macro variables at execution time?
- a. %LET statement
  - b. SYMPUTX routine
  - c. SQL INTO clause

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5. Which of the following correctly creates a macro variable in a PROC SQL step?

- a. 

```
select fee format=dollar8.
      into :daily_fee
      from sasuser.all;
```
- b. 

```
select fee format=dollar8.
      into daily_fee
      from sasuser.all;
```
- c. 

```
if location='Boston' then do;
    call symputx('region', East);
end;
```

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6. Which SQL query assigns the values of the variable **Course\_Code** to the macro variables **Code1** through **Code3** and the values of the data set variable **Location** to the macro variables **Loc1** through **Loc3**?

- a. 

```
select course_code, location
      into: code1-code3, loc1-loc3
      from schedule;
```
- b. 

```
select course_code into :code1-:code3,
      location into :loc1-:loc3
      from schedule;
```
- c. 

```
select course_code, location
      into :code1-:code3, :loc1-:loc3
      from schedule;
```

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7. Which set of statements creates a macro variable named **region** and assigns the value of the data set column **Location**?

a. 

```
if location='Boston' then do;
    call symputx('region', 'Location');
end;
```

b. 

```
if location='Boston' then do;
    %let region=Location;
end;
```

c. 

```
if location='Boston' then do;
    call symputx('region', Location);
end;
```

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8. Which CALL statement correctly creates a macro variable from the result of the numeric expression **amount/number** so that the macro variable shows the value with a dollar sign and no decimal places?

a. `call symputx('avg', amount/number);`

b. `call symputx('avg', amount/number(dollar8.));`

c. `call symputx('avg', put(amount/number,dollar8.));`

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9. Which of the following statements about macro variable resolution is false?
- a. Two consecutive ampersands resolve to one ampersand.
  - b. If more than two consecutive ampersands precede a name token, the macro processor generates an error message.
  - c. The macro processor always rescans a reference that is preceded by multiple ampersands.
  - d. Rescanning continues until there are no remaining macro triggers that the macro processor can resolve.

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10. Given the global symbol table shown here, what value does **&&teach&crs** resolve to?
- a. &teach3
  - b. teach3
  - c. Forest, Debra
  - d. none of the above

Global Symbol Table

Name	Value
TEACH1	Hallis, George
TEACH2	Wickham, Alice
TEACH3	Forest, Debra
CRS	3

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## Lesson 4

1. Which of the following is true?
  - a. A %MACRO statement must always be paired with a %END statement.
  - b. A macro definition can include macro variable references, but it cannot include SAS language statements.
  - c. Only macro language statements are checked for syntax errors when the macro is compiled.
  - d. The MPRINT system option writes a message to the log indicating whether a macro compiles successfully.

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2. Which statement concerning macro parameters is false?
  - a. Parameter names and values are inside parentheses and are comma delimited.
  - b. The order of positional parameter names in a macro definition must match the order of parameter values in a macro call.
  - c. Keyword parameters are assigned a default value after an equal sign.
  - d. Keyword parameters must be listed before positional parameters in a mixed parameter list.

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3. If this program is run in a new SAS session, how many macro variable/value combinations are displayed in the log?

- a. 1
- b. 2
- c. 3
- d. cannot be determined

```
%macro test(y);  
  %let x=y;  
  %put _local_;  
%mend test;  
%test(5)
```

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4. When this program ends execution, what is the value of X?

- a. 0
- b. 5
- c. cannot be determined

```
%macro inner;  
  %let x=&y;  
%mend inner;  
%macro outer(y);  
  %inner  
%mend outer;  
%let x=0;  
%outer(5)
```

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5. Which of the following can be conditionally placed onto the input stack?
- a. only whole steps
  - b. only whole steps or whole statements
  - c. only whole statements or pieces of text within a statement
  - d. whole steps, whole statements, or pieces of text within statements

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6. Which system option can you use to monitor macro execution?
- a. MLOGIC
  - b. MPRINT
  - c. SYMBOLGEN
  - d. MCOMPILENOTE=ALL

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7. Which of the following **reports** macro definitions runs the **weekly** macro if the day of the week is *Friday*?

a. 

```
%macro reports;  
  %daily  
  %if &sysday=Friday %then %weekly;  
%mend reports;
```

b. 

```
%macro reports;  
  %daily  
  %if &sysday=Friday %then %do %weekly;  
%mend reports;
```

c. 

```
%macro reports;  
  %daily  
  %if &sysday="Friday" %then %weekly;  
%mend reports;
```

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8. Which statement correctly checks that the value of the macro variable **Var** is not in the following list: *AU CA DE US*?

a. 

```
%if &var not in AU CA DE US;
```

b. 

```
%if not &var in AU CA DE US;
```

c. 

```
%if not (&var in AU CA DE US);
```

d. 

```
%if &var is not in (AU CA DE US);
```

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9. Which %DO statement does not contain a syntax error?

- a. `%do i=1 to 5;`
- b. `%do %until(&X > 10);`
- c. `%do %while &X < 10;`
- d. `%do i=A, B, C;`

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10. Which expression in a macro %DO loop writes the following messages to the log?

- a. `%put City&i is &Cityi;`
- b. `%put City&i is &City&i;`
- c. `%put City&i is &City&&i;`
- d. `%put City&i is &&City&i;`

```
City1 is London
City2 is Tokyo
City3 is Buenos Aires
City4 is Toronto
```

Local Symbol Table

Name	Value
CITY1	London
CITY2	Tokyo
CITY3	Buenos Aires
CITY4	Toronto
SQLOBS	4

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## Lesson 5

1. When a macro is compiled, it is stored in which location by default?

- a. SASAUTOS
- b. work.sasmacr
- c. MAUTOSTORE
- d. sasuser.macros

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2. Which statement specifies autocall library locations, including autocall macros supplied by SAS and user-defined macros?

- a. `sasmstore=(sasautos, s:/workshop);`
- b. `options sasautos=("s:/workshop", sasautos);`
- c. `%autocall(sasautos, s:/workshop)`
- d. `autocall sasautos=("s:/workshop", sasautos);`

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3. True or False: When an autocall macro is called, it is stored permanently as a compiled macro in a macro catalog until you delete it.

- a. True
- b. False

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4. Which statement ensures that the **Name** parameter value is in uppercase?

- a. `%let &Name=uppercase (Name) ;`
- b. `%let &Name=uppercase (&Name) ;`
- c. `%let Name=%uppercase (&Name) ;`
- d. `%let Name=%uppercase (Name) ;`

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5. Which %IF expression is true if the **Input** parameter value is A?

```
%macro report(input);  
...  
%mend report;  
  
%report(A)
```

- a. %if &input=A or B %then %do;
- b. %if &input in A B %then %do;
- c. %if &input in('A', 'B') %then %do;
- d. none of the above