Introduction to numeric precision and representation issues

Why 4.8 minus 4.6 is not always equal to 0.2
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Example of SAS code to avoid numeric precision problems:

```sas
data example;
  if 4.8 - 4.6 eq 0.2 then equal = "Y";
  else equal = "N";
  put equal=;
run;
```

```sas
LOG:
EQUAL=N
```

```sas
data example2;
  if round(4.8 - 4.6, 0.1) eq 0.2 then equal = "Y";
  else equal = "N";
  put equal=;
run;
```

```sas
LOG:
EQUAL=Y
```

Use PROC COMPARE option „method=ABSOLUTE“:

```sas
proc compare base=work.a compare=work.b method=ABSOLUTE;
run;
```

Summary

Numeric precision and representation issues are well known and often forgotten (especially while programming). These issues do not only occur in SAS but rather originate from the technical limitation of storing floating point numbers in the binary system. Numeric precision problems should be taken into account during programming to avoid lengthy searches for errors.

More Info
Details are described in Pharmaceutical Programming, December 2011. For additional questions you can contact the author: Nicola Tambascia Phone: +49 6196 7709 283 nicola.tambascia@accovion.com

### Values Comparison Summary
- Number of Variables: 1
- Total Number of Values Compared: 1
- Total Number of Values with All Compared Variables Equal: 1
- Total Number of Values with Some Compared Variables Unequal: 0
- Maximum Difference: 1.6653E-16

### Variables Summary
- Number of Variables in Common: 1
- Total Number of Values Compared: 1
- Number of Values with All Obs Equal: 1
- Number of Values with Some Obs Unequal: 0

### Other helpful functions:

<table>
<thead>
<tr>
<th>Function</th>
<th>Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEIL</td>
<td>CEIL(argument)</td>
</tr>
<tr>
<td>CEILZ</td>
<td>CEILZ(argument)</td>
</tr>
<tr>
<td>FLOOR</td>
<td>FLOOR(argument)</td>
</tr>
<tr>
<td>FLOORZ</td>
<td>FLOORZ(argument)</td>
</tr>
<tr>
<td>FUZZ</td>
<td>FUZZ(argument)</td>
</tr>
<tr>
<td>INT</td>
<td>INT(argument)</td>
</tr>
<tr>
<td>INTZ</td>
<td>INTZ(argument)</td>
</tr>
<tr>
<td>MOD</td>
<td>MOD(argument1, argument2)</td>
</tr>
<tr>
<td>MODZ</td>
<td>MODZ(argument1, argument2)</td>
</tr>
<tr>
<td>ROUND</td>
<td>ROUND(argument, rounding-unit)</td>
</tr>
<tr>
<td>ROUNDE</td>
<td>ROUNDE(argument, rounding-unit)</td>
</tr>
<tr>
<td>ROUNDDZ</td>
<td>ROUNDDZ(argument, rounding-unit)</td>
</tr>
</tbody>
</table>