

Computing Hit Rate

A utility has been developed to compute Hit Rate, based on input files that are prepared for use in the BOOT software package.

The first version of this utility has become available in February 2007.

The utility is a DOS-based program called HitRate.exe

It is bundled with free BOOT package, available at
<http://www.harmon.org/kit/download.asp>

The concept of a Hit Rate is used, e.g., in a German VDI Guideline on evaluation of prognostic windfield models (VDI, 2005).

What is the Hit Rate?

The **Hit Rate** q is a metric that has recently been found useful for velocity models. The German VDI Guideline on prognostic meso-scale wind field models sets requirements in terms of this metric (VDI 2005). To evaluate the model performance, normalized values are compared, with the wind speed used for normalisation. From the normalised model results P_i and normalised comparison data O_i a hit rate q is calculated from the equation below, which specifies the fraction of model results that differ within an allowed range D from the comparison data. D accounts for the relative uncertainty of the comparison data. Only those differences are counted that are above a threshold value W , which describes the repeatability of the comparison data.

$$q = \frac{N}{n} = \frac{1}{n} \sum_{i=1}^n N_i \quad \text{with} \quad N_i = \begin{cases} 1 & \text{for } \left| \frac{P_i - O_i}{O_i} \right| \leq D \text{ or } |P_i - O_i| \leq W \\ 0 & \text{else} \end{cases}$$

In other words, a hit is characterised in the following way:

Assume we have an observed value O and a predicted value P

We have a Hit if one of the following conditions is fulfilled:

- Is $\text{Abs}(P-O)$ smaller than the allowed absolute deviation W ?
- Is $\text{Abs}((P-O)/O)$ smaller than the allowed fractional deviation D ?

Step by step instructions

Assume you have prepared an input data set for the BOOT program, called *boottest.inp* (this is the sample file accompanying the BOOT package, shown in *Figure 1*).

Put a copy of *HitRate.exe* in the same folder as *boottest.inp* and doubleclick the icon for *HitRate.exe*

You will be requested to reply to a few questions as outlined in *Figure 2*.

The utility is executed, and as a result you will end up with two output files with a name derived from the original input file.

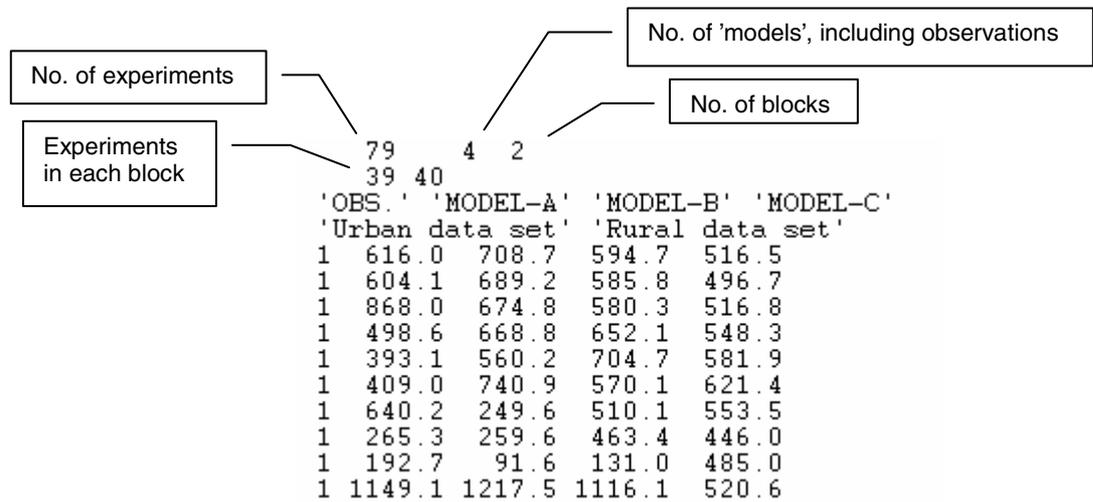


Figure 1 Sample file `boottest.inp`

Figure 2 Dialog with the HitRate utility. User responses in yellow.

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HitRate program. Level 05Feb2007

The program requires an input file in BOOT format.

Name of input file :
boottest.inp

Characterisation of a Hit:
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Assume we have an observed value O and a predicted value P

We have a Hit if one of the following conditions is fulfilled:

Is Abs(P-O) smaller than the allowed absolute deviation W?
Is Abs((P-O)/O) smaller than the allowed fractional deviation D?

First enter allowed absolute deviation W (e.g. 0.06)
20
Next, enter allowed fractional deviation (e.g. 0.25 for 25% allowed deviation)
0.20

Calculating performance measures for block 1
Calculating performance measures for block 2

boottest.inp has been processed.

Two output files have been produced:

- HitRateTable_boottest.inp contains tables of hit rates.
- HitData_boottest.inp has the format of a BOOT input file.
  It resembles boottest.inp, but contains zeros for non-hits and ones for hits.

Program Completed
Press Enter to Continue.

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