Bayes, version 1.1, 2021-01-31

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Bayes' Theorem may be stated in the following form:

P(Hi|B)=

Here, H1,...,Hn is a partitioning of the event space by mutually disjoint sets Hi and B is an event with P(B)>0. The vertical bar | denotes conditional probability.

Now think of H1,...,Hn as hypotheses whose probabilities may be affected by data. The evidence B corresponds to data which were not used in computing the prior probabilities P(Hi). The P(Hi|B) are then the updated (or posterior) probabilities of the Hi given B.

In the program, three baskets can be filled by the user with up to ten balls of four different colors. The calculator chooses one basket, the user has to guess which, that is to say, decide between hypotheses H1, H2 and H3.

In the first step without evidence, he assigns equal probabilities P(Hi) to the non-empty baskets. Now the calculator draws one or ten balls (with replacement) from the chosen basket and discloses them to the user as evidence B. The updated probabilities (Hi|B) are displayed. The user can now try to guess the basket where the sample comes from or have the calculator draw another sample until the updated probabilities indicate more clearly which basket to choose.

To place a ball in a basket, press the tab-key until on the right side the ball with the required color is highlighted. Use the arrow key to move the highlighted ball above the target basket. Press the tab-key again to drop the ball into the basket. Similarly, you can move a ball from one basket to another.  
You can delete a ball by moving it into the region beneath or on the right of the baskets.

Use the Enter key to pass from the first screen (basket filling) to the second (drawing balls) and the Escape-key to return. The menu item Baskets->Fill at random fills the three baskets automatically with a random choice of ten balls each.

Function of keys:  
Filling (first) screen:  
Arrow keys: Move the highlighted ball  
Tab-key: toggle between all displayed balls, drop a ball placed above a basket into it  
Enter-key: change to second screen  
“N”-key: new game.

Drawing screen:  
Tab-key: toggle between buttons  
Arrow up-down: one button up or down  
Enter-key: Press highlighted button  
“N”-key: new game, back to first screen  
Escape-key: back to first screen

If a mouse pointer is available, you can drag the balls by left-clicking on them and holding the mouse key down. On the second screen, you can click on the buttons to activate them.