TARGET for the TI-73/83/84

Target is a two-person game. A Start Number \(N_1\) is selected randomly. Also a Target Range \((T+\text{-} R)\) is randomly determined. The object of the game is to estimate a factor by which to multiply \(N\) so that the product falls within the target range. If the factor the first player selects does not result in a product that falls in the given range, the calculated product becomes the new Start Number \(N_2\). The Target Range remains the same. It is now the second player’s turn to estimate a factor by which to multiply the new Start Number \(N_2\). The game continues with players taking turns until the product falls within the given range.

The TI-73 or 83 can be used to help select \(N\), \(T\) and \(R\) using the randInt() function which is accessed by pressing: \(\boxed{\text{PRB}2:(\text{randInt})}\)

\[
\text{randInt}(50,1000) = N \\
\text{randInt}(99,1000) = T \\
\text{randInt}(3,10) = R
\]

Target Range: \((T-R) – (T+R): \Box - \Box\)

Seeding the Random Number Generator

The variable \text{rand} (found in the PRB menu of the \(\boxed{\text{PRB}}\) key) may need to be seeded so that every calculator is not generating the same random number sequence. To do this, have each student enter their own “favorite” six digit number and store it into \text{rand}, which is item \#1 on the same menu as randInt().

Program

A programmed version of Target exists which automates selecting the target range and the beginning number. The directions to operate the program appear on the screen. Any number may be entered when asked, “What problem do you want?” This feature allows for a classroom competition where all students are attempting the same problems. On the TI-73 and TI-83, only the number keys and the negative and decimal keys are operable when entering a response. The operation keys and arrow keys will not work. If an input error is made, press \(\boxed{\text{C}}\).
At the end of the game the students may elect to review all the rounds by viewing the problems and responses stored in the calculator lists. Following the instructions on the screen to access the following lists:

- **TURN (L1):** Round
- **LBND (L2):** Lower boundary of Target Range
- **UBND (L3):** Upper boundary of Target Range
- **NUMBR (L4):** Start Number
- **FACTR (L5):** Estimated Factor
- **PROD (L6):** Product of Start Number and Estimated Factor which becomes the Start Number in the next round

**IMPORTANT NOTE**

On the TI-73 and TI-83 the program DEFAULT should be executed when done using the TARGET program to restore default lists L1 through L6.

If you do not have this program, do the following:

**TI-73:** press \( \mathbf{ψ} \) [CATALOG], scroll to select the SetUpEditor command, \( \subseteq \). A shortcut for scrolling through the lengthy catalog is the following:

\[ \mathbf{ψ}[\text{CATALOG]} \mathbf{ψ}[\text{TEXT}] \mathbf{|} \mathbf{|}[\mathbf{S}] \subseteq \mathbf{ SetUpEditor\subseteq} \]

**TI-83:** press \( \mathbf{EDIT} \) \( \mathbf{5}: \) SetUpEditor \( \subseteq \)

If done correctly the home screen will appear as follows:
You can press the on key any time to stop the program. Press enter to continue.

Press clear to erase a mistake. Press enter to continue.

-Goal-
To multiply the given number by a factor so that the product is within the target range of...

* 158-164 *
(Press enter)

Target Range 158-164
Here is the start number...

???
Enter a factor (Press enter first)

Enter -1 to go back to the last screen or enter your factor.

?.95

777 * .22 = 170.9
Deps, you missed the target!
This product now becomes the new start number.
Press enter.

Target Range 158-164
Here is the start number...

170.9
Enter a factor (Press enter first)

Enter -1 to go back to the last screen or enter your factor.

?.22

Congratulations!
You hit the target. 162.4 is between 158 and 164.
Number of attempts - 2

To review press enter-list.
To stop press enter-2nd-quit.
To start over press enter-2nd-quit-enter.

<table>
<thead>
<tr>
<th>TURN</th>
<th>LRND</th>
<th>URND</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>158</td>
<td>164</td>
<td>164</td>
<td>158</td>
<td>158</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>FACTR</th>
<th>PROD</th>
</tr>
</thead>
<tbody>
<tr>
<td>777</td>
<td>.22</td>
<td>162.4</td>
</tr>
<tr>
<td>170.9</td>
<td>.22</td>
<td>162.4</td>
</tr>
<tr>
<td>170.9</td>
<td></td>
<td>170.9</td>
</tr>
</tbody>
</table>

Turn(1) = 1
Prod(1) = 170.9

Judy Wheeler
April, 2000
TARGET GAMESHEET

PLAYER #1 ____________________  PLAYER #2 ____________________

TARGET RANGE: _______ - _______

<table>
<thead>
<tr>
<th>ROUND</th>
<th>NUMBER</th>
<th>FACTOR</th>
<th>PRODUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What was difficult about estimating a good factor?

What strategies seemed to be helpful? Describe the conditions when each strategy worked best.