EYE TESTING INTERFACE
### Current World Population:

7,077,312,143

### Population growth today

<table>
<thead>
<tr>
<th>Count</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>359,266</td>
<td>Births today</td>
</tr>
<tr>
<td>153,440</td>
<td>Deaths today</td>
</tr>
<tr>
<td>205,826</td>
<td>Net population growth today</td>
</tr>
</tbody>
</table>

### Population growth this year

<table>
<thead>
<tr>
<th>Count</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>112,809,212</td>
<td>Births this year</td>
</tr>
<tr>
<td>48,179,830</td>
<td>Deaths this year</td>
</tr>
<tr>
<td>64,629,381</td>
<td>Net population growth this year</td>
</tr>
</tbody>
</table>
Blindness & Visual Impairment by the Numbers

- Approximately 800 million people worldwide are
  - Either blind, → 45 million
  - severely visually impaired or → 269 million
  - have near vision sight loss → 517 million

International Agency for the Prevention of Blindness.

✓ 80 percent of blindness is avoidable.
✓ 145 million people have low vision due to uncorrected refractive errors.


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The People Affected

- Women greater risk; two-thirds of blind people.
- Low-income countries have 90% of blind people.
- Old aged 82% of all visually impaired are of age 50 years or more.
- Children >12 million children ages 5 to 15 are visually impaired because of uncorrected refractive errors.

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ONLINE EYE TESTING INTERFACE

Interface to enable quick and easy eye testing. A person should be able use his/her Computer to test his eyes for refractive errors. All he should have to do is run the interface, follow instructions and take the advice.

Targeted User group:
1) Children
2) Women
3) Old aged
4) Rural areas
5) Illiterate

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You may be familiar with this

SNELLLEN CHART
Visual Acuity

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SNELLEN CHART

- Printed with eleven lines of block letters (OPTOTYPES).
- The first line consists of one very large letter, which may be one of several letters, for example E, H, or N.
- Subsequent rows have increasing numbers of letters that decrease in size.
- Peculiar geometry.

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TRADITIONAL TEST

• A person taking the test covers one eye, and reads aloud the letters of each row, beginning at the top.
• The smallest row that can be read accurately indicates the visual acuity in that eye.
The symbols on an acuity chart are formally known as **Optotypes**. In the case of the traditional Snellen chart, the optotypes have the appearance of block letters, and are intended to be seen and read as letters. They are not, however, letters from any ordinary typographer's font. They have a particular, simple geometry in which:

- the thickness of the lines equals the thickness of the white spaces between lines and the thickness of the gap in the letter "C"
- the height and width of the optotype (letter) is five times the thickness of the line.
In original Snellen Chart, only the ten Sloan letters C, D, E, F, L, N, O, P, T, Z are used in the traditional Snellen chart. The perception of five out of six letters (or similar ratio) is judged to be the Snellen fraction.
STANDARDS

- According to BS 4274-1:2003 only the letters C, D, E, F, H, K, N, P, R, U, V, and Z should be used for the testing of vision based upon equal legibility of the letters.
- The luminance of the presentation shall be uniform and not less than 120 cd/m². Any variation across the test chart shall not exceed 20%.
VISUAL ACUITY

- **Visual acuity** =
  Distance at which the test is made divided by distance at which smallest optotype identified subtends an angle of 5 arcminutes.

Reference Table

<table>
<thead>
<tr>
<th>Distance (feet)</th>
<th>70</th>
<th>60</th>
<th>50</th>
<th>40</th>
<th>30</th>
<th>20</th>
<th>15</th>
<th>10</th>
<th>7</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>letter ht (mm)</td>
<td>31</td>
<td>27</td>
<td>22</td>
<td>18</td>
<td>13</td>
<td>9</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>letter ht (pt)</td>
<td>88</td>
<td>76</td>
<td>63</td>
<td>50</td>
<td>38</td>
<td>25</td>
<td>19</td>
<td>13</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>font size (pt)</td>
<td>152</td>
<td>130</td>
<td>108</td>
<td>87</td>
<td>65</td>
<td>43</td>
<td>33</td>
<td>21</td>
<td>15</td>
<td>9</td>
</tr>
</tbody>
</table>
STANDARD VISION

Snellen defined “standard vision” as the ability to recognize one of his optotypes when it subtended 5 minutes of arc. Thus the optotype can only be recognized if the person viewing it can discriminate a spatial pattern separated by a visual angle of 1 minute of arc.
EYE TESTING INTERFACE

- Predesigned Snellen Chart developed using BSI Standards.
- Interactive GUI with user-friendly attributes.
- A person has to enter his name, sex, age etc
- Read the instructions.
- Sequentially decreasing Optotypes appear on the screen and he is supposed to enter whatever he sees from a specified distance using a wired or wireless keyboard at or by taking someone’s help (Reading out loud).

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DEMO

EYE TESTING INTERFACE

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Future plans

- Develop a reliable framework that can be used for testing vision of illiterate people.
- Increasing the reliability of test by incorporating other eye vision charts.
- Enabling speech recognition features.
- Add features for testing other eye complications.
  - Eye scan – video analysis to detect symptoms for infections, ailments like conjunctivitis etc.
THANK YOU