

Time evolution of the symmetry of alphabet symbols and its quantification: study in the archeology of symmetry

Artem Gilevich¹, Mark Frenkel¹, Shraga Shoval², Edward Bormashenko^{*2}

¹ Department of Chemical Engineering, Ariel University, Ariel, POB 3, 407000, Israel

² Department of Industrial Engineering and Management, Faculty of Engineering, Ariel University, P.O.B. 3, Ariel 407000, Israel

* Correspondence: edward@ariel.ac.il

Schoenflies scheme notation:

identity transformation (C_1),

horizontal mirror axis (S_1)

vertical mirror axis (S_2)

diagonal mirror axes (S_3 , S_4)

rotation on 180° (C_2)

4-fold rotational symmetry (C_4 , C_2 , C_4^3)

| Archaic Western Greek | | | | | | | | |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|---------|
| Script | C_1 | S_1 | S_2 | S_3 | S_4 | C_4 | C_2 | C_4^3 |
| Α | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Β | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Γ | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Δ | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ε | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ζ | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Η | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| Θ | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| ⊗ | 1 | 1 | 1 | 1/0 | 1/0 | 1/0 | 1 | 1/0 |
| Ι | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| Κ | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Λ | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Μ | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ν | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ο | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| Π | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ρ | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Ϝ | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Ϛ | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ϛ | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ϝ | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ϛ | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| ϛ | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Υ | 1 | 1 | 1 | 1/0 | 1/0 | 1/0 | 1 | 1/0 |
| Χ | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| Φ | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Ψ | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

| Etruscan from Marsiliana | | | | | | | | |
|--------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------------|
| Script | C ₁ | S ₁ | S ₂ | S ₃ | S ₄ | C ₄ | C ₂ | C ₄ ³ |
| A | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 𐌠 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
|) | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌡 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌢 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌣 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| I | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 𐌦 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| ⊗ | 1 | 1 | 1 | 1/0 | 1/0 | 1/0 | 1 | 1/0 |
| 𐌨 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 𐌩 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌪 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌫 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌬 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌭 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌮 | 1 | 1 | 1 | 1/0 | 1/0 | 1/0 | 1 | 1/0 |
| O | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 𐌰 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 𐌴 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 𐌵 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌶 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| T | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 𐌸 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| X | 1 | 1 | 1 | 1/0 | 1/0 | 1/0 | 1 | 1/0 |
| 𐌺 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 𐌻 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

| Archaic Etruscan | | | | | | | | |
|------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------------|
| Scri pt | C ₁ | S ₁ | S ₂ | S ₃ | S ₄ | C ₄ | C ₂ | C ₄ ³ |
| A | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
|) | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌢 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌣 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| I | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 𐌦 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| ⊗ | 1 | 1 | 1 | 1/0 | 1/0 | 1/0 | 1 | 1/0 |
| 𐌨 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 𐌩 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌪 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌫 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌬 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌭 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌮 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 𐌴 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 𐌵 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌶 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| T | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 𐌸 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| X | 1 | 1 | 1 | 1/0 | 1/0 | 1/0 | 1 | 1/0 |
| 𐌺 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 𐌻 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 8 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |

| Neo-Etruscan | | | | | | | | |
|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------------|
| Script | C ₁ | S ₁ | S ₂ | S ₃ | S ₄ | C ₄ | C ₂ | C ₄ ³ |
| 𐌀 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 𐌁 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌂 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌃 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌄 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 𐌅 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 𐌆 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 𐌇 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 𐌈 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌉 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌊 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌋 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌌 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌍 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 𐌎 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌏 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 𐌐 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐌑 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 𐌒 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 𐌓 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 𐌔 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |

| Euclidean Greek | | | | | | | | |
|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------------|
| Script | C ₁ | S ₁ | S ₂ | S ₃ | S ₄ | C ₄ | C ₂ | C ₄ ³ |
| A α | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| B β β | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Γ γ | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Δ δ | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| E ε ε | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Z ζ | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| H η | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| Θ θ θ | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| I ι | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| K κ κ | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Λ λ | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| M μ | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| N ν | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Ξ ξ | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| O ο | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| Π π ω | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| P ρ ρ | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Σ σ ς | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| T τ | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Υ υ υ | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Φ φ φ | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| Χ χ | 1 | 1 | 1 | 1/0 | 1/0 | 1/0 | 1 | 1/0 |
| Ψ ψ | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Ω ω | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

| Hebrew | | | | | | | | |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------------|
| Script | C ₁ | S ₁ | S ₂ | S ₃ | S ₄ | C ₄ | C ₂ | C ₄ ³ |
| א | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| ב | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ג | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ד | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ה | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ו | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| ז | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ח | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ט | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| י | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| כ | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| ל | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| מ | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| נ | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ס | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| ע | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| פ | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| צ | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ק | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ר | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ש | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ת | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Proto-Hebrew | | | | | | | | |
|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------------|
| Script | C ₁ | S ₁ | S ₂ | S ₃ | S ₄ | C ₄ | C ₂ | C ₄ ³ |
| 𐤀 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐤁 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐤂 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐤃 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐤄 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐤅 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐤆 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 𐤇 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 𐤈 | 1 | 1 | 1 | 1/0 | 1/0 | 1/0 | 1 | 1/0 |
| 𐤉 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐤊 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐤋 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐤌 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐤍 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐤎 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐤏 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 𐤐 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 𐤑 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐤒 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐤓 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 𐤔 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 𐤕 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 𐤖 | 1 | 1 | 1 | 1/0 | 1/0 | 1/0 | 1 | 1/0 |

| Archaic Latin | | | | | | | | | |
|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------------|--|
| Script | C ₁ | S ₁ | S ₂ | S ₃ | S ₄ | C ₄ | C ₂ | C ₄ ³ | |
| R | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | |
| B | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| C | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| D | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| E | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| F | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| H | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | |
| I | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | |
| k | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| L | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| W | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | |
| W | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | |
| O | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | |
| P | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Q | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | |
| P | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| S | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | |
| T | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| VY | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | |
| X | 1 | 1 | 1 | 1/0 | 1/0 | 1/0 | 1 | 1/0 | |

| Classical Latin | | | | | | | | | |
|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------------|--|
| Script | C ₁ | S ₁ | S ₂ | S ₃ | S ₄ | C ₄ | C ₂ | C ₄ ³ | |
| A | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | |
| B | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| C | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| D | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| E | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| F | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| G | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| H | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | |
| I | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | |
| K | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| L | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| M | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | |
| N | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | |
| O | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | |
| P | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Q | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| R | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| S | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | |
| T | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | |
| V | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | |
| X | 1 | 1 | 1 | 1/0 | 1/0 | 1/0 | 1 | 1/0 | |
| Y | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | |
| Z | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | |

| English | | | | | | | | |
|---------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------------|
| Script | C ₁ | S ₁ | S ₂ | S ₃ | S ₄ | C ₄ | C ₂ | C ₄ ³ |
| A | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| B | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| C | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| D | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| E | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| F | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| G | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| H | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| I | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| J | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| K | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| L | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| N | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| O | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| P | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Q | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| T | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| U | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| V | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| W | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| X | 1 | 1 | 1 | 1/0 | 1/0 | 1/0 | 1 | 1/0 |
| Y | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Z | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |