1. Hydrogen (H)

- **Atomic Number**: 1 → `00000001`
- **Configuration**: s-block (Group 1) → `1000`
- **Valence Electrons**: 1 → `001`
- **Electronegativity**: 2.20 < 2.5 → `0`
- **Period**: 1 → `001`
- **Group**: 1 → `00001`
- **Vector**: `00000001 1000 001 0 00100001`

2. Helium (He)

- **Atomic Number**: 2 → `00000010`
- **Configuration**: s-block (Group 18) → `1000`
- **Valence Electrons**: Noble gas, full shell → `000`
- **Electronegativity**: Undefined (noble gas), set to 0 → `0`
- **Period**: 1 → `001`
- **Group**: 18 → `10010`
- **Vector**: `00000010 1000 000 0 00110010`

3. Lithium (Li)

- **Atomic Number**: 3 → `00000011`
- **Configuration**: s-block (Group 1) → `1000`
- **Valence Electrons**: 1 → `001`
- **Electronegativity**: 0.98 < 2.5 → `0`
- **Period**: 2 → `010`
- **Group**: 1 → `00001`
- **Vector**: `00000011 1000 001 0 01000001`

4. Beryllium (Be)

- **Atomic Number**: 4 → `00000100`
- **Configuration**: s-block (Group 2) → `1000`
- **Valence Electrons**: 2 → `010`

- **Electronegativity**: 1.57 < 2.5 → `0`
- **Period**: 2 → `010`
- **Group**: 2 → `00010`
- **Vector**: `00000100 1000 010 0 01000010`

5. Boron (B)

- **Atomic Number**: 5 → `00000101`
- **Configuration**: p-block (Group 13) → `1100`
- **Valence Electrons**: 13 – 10 = 3 → `011`
- **Electronegativity**: 2.04 < 2.5 → `0`
- **Period**: 2 → `010`
- **Group**: 13 → `01101`
- **Vector**: `00000101 1100 011 0 01001101`

6. Carbon (C)

- **Atomic Number**: 6 → `00000110`
- **Configuration**: p-block (Group 14) → `1100`
- **Valence Electrons**: 14 – 10 = 4 → `100`
- **Electronegativity**: 2.55 ≥ 2.5 → `1`
- **Period**: 2 → `010`
- **Group**: 14 → `01110`
- **Vector**: `00000110 1100 100 1 01001110`

7. Nitrogen (N)

- **Atomic Number**: 7 → `00000111`
- **Configuration**: p-block (Group 15) → `1100`
- **Valence Electrons**: 15 – 10 = 5 → `101`
- **Electronegativity**: 3.04 ≥ 2.5 → `1`
- **Period**: 2 → `010`
- **Group**: 15 → `01111`
- **Vector**: `00000111 1100 101 1 01001111`

8. Oxygen (O)

- **Atomic Number**: 8 → `00001000`
- **Configuration**: p-block (Group 16) → `1100`
- **Valence Electrons**: 16 – 10 = 6 → `110`
- **Electronegativity**: 3.44 ≥ 2.5 → `1`
- **Period**: 2 → `010`
- **Group**: 16 → `10000`
- **Vector**: `00001000 1100 110 1 01010000`

9. Fluorine (F)

- **Atomic Number**: 9 → `00001001`
- **Configuration**: p-block (Group 17) → `1100`
- **Valence Electrons**: 17 – 10 = 7 → `111`
- **Electronegativity**: 3.98 ≥ 2.5 → `1`
- **Period**: 2 → `010`
- **Group**: 17 → `10001`
- **Vector**: `00001001 1100 111 1 01010001`

10. Neon (Ne)

- **Atomic Number**: 10 → `00001010`
- **Configuration**: p-block (Group 18) → `1100`
- **Valence Electrons**: Noble gas, full shell → `000`
- **Electronegativity**: Undefined, set to 0 → `0`
- **Period**: 2 → `010`
- **Group**: 18 → `10010`
- **Vector**: `00001010 1100 000 0 01010010`

11. Sodium (Na)

- **Atomic Number**: 11 → `00001011`
- **Configuration**: s-block (Group 1) → `1000`

- **Valence Electrons**: 1 → `001`
- **Electronegativity**: 0.93 < 2.5 → `0`
- **Period**: 3 → `011`
- **Group**: 1 → `00001`
- **Vector**: `00001011 1000 001 0 011 00001`

12. Magnesium (Mg)

- **Atomic Number**: 12 → `00001100`
- **Configuration**: s-block (Group 2) → `1000`
- **Valence Electrons**: 2 → `010`
- **Electronegativity**: 1.31 < 2.5 → `0`
- **Period**: 3 → `011`
- **Group**: 2 → `00010`
- **Vector**: `00001100 1000 010 0 011 00010`

13. Aluminum (Al)

- **Atomic Number**: 13 → `00001101`
- **Configuration**: p-block (Group 13) → `1100`
- **Valence Electrons**: 3 → `011`
- **Electronegativity**: 1.61 < 2.5 → `0`
- **Period**: 3 → `011`
- **Group**: 13 → `01101`
- **Vector**: `00001101 1100 011 0 011 01101`

14. Silicon (Si)

- **Atomic Number**: 14 → `00001110`
- **Configuration**: p-block (Group 14) → `1100`
- **Valence Electrons**: 4 → `100`
- **Electronegativity**: 1.9 < 2.5 → `0`
- **Period**: 3 → `011`
- **Group**: 14 → `01110`
- **Vector**: `00001110 1100 100 0 011 01110`

15. Phosphorus (P)

- **Atomic Number**: 15 → `00001111`
- **Configuration**: p-block (Group 15) → `1100`
- **Valence Electrons**: 5 → `101`
- **Electronegativity**: 2.19 < 2.5 → `0`
- **Period**: 3 → `011`
- **Group**: 15 → `01111`
- **Vector**: `00001111 1100 101 0 011 01111`

16. Sulfur (S)

- **Atomic Number**: 16 → `00010000`
- **Configuration**: p-block (Group 16) → `1100`
- **Valence Electrons**: 6 → `110`
- **Electronegativity**: 2.58 ≥ 2.5 → `1`
- **Period**: 3 → `011`
- **Group**: 16 → `10000`
- **Vector**: `00010000 1100 110 1 011 10000`

17. Chlorine (Cl)

- **Atomic Number**: 17 → `00010001`
- **Configuration**: p-block (Group 17) → `1100`
- **Valence Electrons**: 7 → `111`
- **Electronegativity**: 3.16 ≥ 2.5 → `1`
- **Period**: 3 → `011`
- **Group**: 17 → `10001`
- **Vector**: `00010001 1100 111 1 011 10001`

18. Argon (Ar)

- **Atomic Number**: 18 → `00010010`
- **Configuration**: p-block (Group 18) → `1100`

- **Valence Electrons**: Noble gas, full shell → `000`
- **Electronegativity**: Undefined, set to 0 → `0`
- **Period**: 3 → `011`
- **Group**: 18 → `10010`
- **Vector**: `00010010 1100 000 0 011 10010`

19. Potassium (K)

- **Atomic Number**: 19 → `00010011`
- **Configuration**: s-block (Group 1) → `1000`
- **Valence Electrons**: 1 → `001`
- **Electronegativity**: 0.82 < 2.5 → `0`
- **Period**: 4 → `100`
- **Group**: 1 → `00001`
- **Vector**: `00010011 1000 001 0 100 00001`

20. Calcium (Ca)

- **Atomic Number**: 20 → `00010100`
- **Configuration**: s-block (Group 2) → `1000`
- **Valence Electrons**: 2 → `010`
- **Electronegativity**: 1.0 < 2.5 → `0`
- **Period**: 4 → `100`
- **Group**: 2 → `00010`
- **Vector**: `00010100 1000 010 0 100 00010`

21. Scandium (Sc)

- **Atomic Number**: 21 → `00010101`
- **Configuration**: d-block (Group 3) → `1010`
- **Valence Electrons**: 2 ($4s^2$) → `010`
- **Electronegativity**: 1.36 < 2.5 → `0`
- **Period**: 4 → `100`
- **Group**: 3 → `00011`
- **Vector**: `00010101 1010 010 0 10000011`

22. Titanium (Ti)

- **Atomic Number**: 22 → `00010110`
- **Configuration**: d-block (Group 4) → `1010`
- **Valence Electrons**: 2 ($4s^2$) → `010`
- **Electronegativity**: 1.54 < 2.5 → `0`
- **Period**: 4 → `100`
- **Group**: 4 → `00100`
- **Vector**: `00010110 1010 010 0 100 00100`

23. Vanadium (V)

- **Atomic Number**: 23 → `00010111`
- **Configuration**: d-block (Group 5) → `1010`
- **Valence Electrons**: 2 ($4s^2$) → `010`
- **Electronegativity**: 1.63 < 2.5 → `0`
- **Period**: 4 → `100`
- **Group**: 5 → `00101`
- **Vector**: `00010111 1010 010 0 100 00101`

24. Chromium (Cr)

- **Atomic Number**: 24 → `00011000`
- **Configuration**: d-block (Group 6) → `1010`
- **Valence Electrons**: 1 ($4s^1$ due to exception) → `001`
- **Electronegativity**: 1.66 < 2.5 → `0`
- **Period**: 4 → `100`
- **Group**: 6 → `00110`
- **Vector**: `00011000 1010 001 0 100 00110`

25. Manganese (Mn)

- **Atomic Number**: 25 → `00011001`
- **Configuration**: d-block (Group 7) → `1010`

- **Valence Electrons**: 2 (4s²) → `010`
- **Electronegativity**: 1.55 < 2.5 → `0`
- **Period**: 4 → `100`
- **Group**: 7 → `00111`
- **Vector**: `00011001 1010 010 0 100 00111`

26. Iron (Fe)

- **Atomic Number**: 26 → `00011010`
- **Configuration**: d-block (Group 8) → `1010`
- **Valence Electrons**: 2 (4s²) → `010`
- **Electronegativity**: 1.83 < 2.5 → `0`
- **Period**: 4 → `100`
- **Group**: 8 → `01000`
- **Vector**: `00011010 1010 010 0 10001000`

27. Cobalt (Co)

- **Atomic Number**: 27 → `00011011`
- **Configuration**: d-block (Group 9) → `1010`
- **Valence Electrons**: 2 (4s²) → `010`
- **Electronegativity**: 1.88 < 2.5 → `0`
- **Period**: 4 → `100`
- **Group**: 9 → `01001`
- **Vector**: `00011011 1010 010 0 10001001`

28. Nickel (Ni)

- **Atomic Number**: 28 → `00011100`
- **Configuration**: d-block (Group 10) → `1010`
- **Valence Electrons**: 2 (4s²) → `010`
- **Electronegativity**: 1.91 < 2.5 → `0`
- **Period**: 4 → `100`
- **Group**: 10 → `01010`
- **Vector**: `00011100 1010 010 0 10001010`

29. Copper (Cu)

- **Atomic Number**: 29 → `00011101`
- **Configuration**: d-block (Group 11) → `1010`
- **Valence Electrons**: 1 ($4s^1$ due to exception) → `001`
- **Electronegativity**: 1.90 < 2.5 → `0`
- **Period**: 4 → `100`
- **Group**: 11 → `01011`
- **Vector**: `00011101 1010 001 0 10001011`

30. Zinc (Zn)

- **Atomic Number**: 30 → `00011110`
- **Configuration**: d-block (Group 12) → `1010`
- **Valence Electrons**: 2 ($4s^2$) → `010`
- **Electronegativity**: 1.65 < 2.5 → `0`
- **Period**: 4 → `100`
- **Group**: 12 → `01100`
- **Vector**: `00011110 1010 010 0 10001100`

31. Gallium (Ga)

- **Atomic Number**: 31 → `00011111`
- **Configuration**: p-block (Group 13) → `1100`
- **Valence Electrons**: 3 → `011`
- **Electronegativity**: 1.81 < 2.5 → `0`
- **Period**: 4 → `100`
- **Group**: 13 → `01101`
- **Vector**: `00011111 1100 011 0 10001101`

32. Germanium (Ge)

- **Atomic Number**: 32 → `00100000`
- **Configuration**: p-block (Group 14) → `1100`

- **Valence Electrons**: 4 → `100`
- **Electronegativity**: 2.01 < 2.5 → `0`
- **Period**: 4 → `100`
- **Group**: 14 → `01110`
- **Vector**: `00100000 1100 100 0 10001110`

33. Arsenic (As)

- **Atomic Number**: 33 → `00100001`
- **Configuration**: p-block (Group 15) → `1100`
- **Valence Electrons**: 5 → `101`
- **Electronegativity**: 2.18 < 2.5 → `0`
- **Period**: 4 → `100`
- **Group**: 15 → `01111`
- **Vector**: `00100001 1100 101 0 10001111`

34. Selenium (Se)

- **Atomic Number**: 34 → `00100010`
- **Configuration**: p-block (Group 16) → `1100`
- **Valence Electrons**: 6 → `110`
- **Electronegativity**: 2.55 ≥ 2.5 → `1`
- **Period**: 4 → `100`
- **Group**: 16 → `10000`
- **Vector**: `00100010 1100 110 1 10010000`

35. Bromine (Br)

- **Atomic Number**: 35 → `00100011`
- **Configuration**: p-block (Group 17) → `1100`
- **Valence Electrons**: 7 → `111`
- **Electronegativity**: 2.96 ≥ 2.5 → `1`
- **Period**: 4 → `100`
- **Group**: 17 → `10001`
- **Vector**: `00100011 1100 111 1 10010001`

36. Krypton (Kr)

- **Atomic Number**: 36 → `00100100`
- **Configuration**: p-block (Group 18) → `1100`
- **Valence Electrons**: Noble gas, full shell → `000`
- **Electronegativity**: Undefined, set to 0 → `0`
- **Period**: 4 → `100`
- **Group**: 18 → `10010`
- **Vector**: `00100100 1100 000 0 10010010`

37. Rubidium (Rb)

- **Atomic Number**: 37 → `00100101`
- **Configuration**: s-block (Group 1) → `1000`
- **Valence Electrons**: 1 → `001`
- **Electronegativity**: 0.82 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 1 → `00001`
- **Vector**: `00100101 1000 001 0 10100001`

38. Strontium (Sr)

- **Atomic Number**: 38 → `00100110`
- **Configuration**: s-block (Group 2) → `1000`
- **Valence Electrons**: 2 → `010`
- **Electronegativity**: 0.95 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 2 → `00010`
- **Vector**: `00100110 1000 010 0 10100010`

39. Yttrium (Y)

- **Atomic Number**: 39 → `00100111`
- **Configuration**: d-block (Group 3) → `1010`

- **Valence Electrons**: 2 → `010`
- **Electronegativity**: 1.22 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 3 → `00011`
- **Vector**: `00100111 1010 010 0 10100011`

40. Zirconium (Zr)

- **Atomic Number**: 40 → `00101000`
- **Configuration**: d-block (Group 4) → `1010`
- **Valence Electrons**: 2 → `010`
- **Electronegativity**: 1.33 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 4 → `00100`
- **Vector**: `00101000 1010 010 0 101 00100`

41. Niobium (Nb)

- **Atomic Number**: 41 → `00101001`
- **Configuration**: d-block (Group 5) → `1010`
- **Valence Electrons**: 2 ($5s^2$) → `010`
- **Electronegativity**: 1.6 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 5 → `00101`
- **Vector**: `00101001 1010 010 0 101 00101`

42. Molybdenum (Mo)

- **Atomic Number**: 42 → `00101010`
- **Configuration**: d-block (Group 6) → `1010`
- **Valence Electrons**: 1 ($5s^1$ due to exception) → `001`
- **Electronegativity**: 2.16 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 6 → `00110`
- **Vector**: `00101010 1010 001 0 101 00110`

43. Technetium (Tc)

- **Atomic Number**: 43 → `00101011`
- **Configuration**: d-block (Group 7) → `1010`
- **Valence Electrons**: 2 ($5s^2$) → `010`
- **Electronegativity**: 1.9 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 7 → `00111`
- **Vector**: `00101011 1010 010 0 101 00111`

44. Ruthenium (Ru)

- **Atomic Number**: 44 → `00101100`
- **Configuration**: d-block (Group 8) → `1010`
- **Valence Electrons**: 1 ($5s^1$ due to exception) → `001`
- **Electronegativity**: 2.2 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 8 → `01000`
- **Vector**: `00101100 1010 001 0 101 01000`

45. Rhodium (Rh)

- **Atomic Number**: 45 → `00101101`
- **Configuration**: d-block (Group 9) → `1010`
- **Valence Electrons**: 1 ($5s^1$ due to exception) → `001`
- **Electronegativity**: 2.28 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 9 → `01001`
- **Vector**: `00101101 1010 001 0 101 01001`

46. Palladium (Pd)

- **Atomic Number**: 46 → `00101110`
- **Configuration**: d-block (Group 10) → `1010`

- **Valence Electrons**: 0 ($5s^0$, full 4d shell) → `000`
- **Electronegativity**: 2.20 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 10 → `01010`
- **Vector**: `00101110 1010 000 0 101 01010`

47. Silver (Ag)

- **Atomic Number**: 47 → `00101111`
- **Configuration**: d-block (Group 11) → `1010`
- **Valence Electrons**: 1 ($5s^1$) → `001`
- **Electronegativity**: 1.93 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 11 → `01011`
- **Vector**: `00101111 1010 001 0 101 01011`

48. Cadmium (Cd)

- **Atomic Number**: 48 → `00110000`
- **Configuration**: d-block (Group 12) → `1010`
- **Valence Electrons**: 2 ($5s^2$) → `010`
- **Electronegativity**: 1.69 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 12 → `01100`
- **Vector**: `00110000 1010 010 0 101 01100`

49. Indium (In)

- **Atomic Number**: 49 → `00110001`
- **Configuration**: p-block (Group 13) → `1100`
- **Valence Electrons**: 3 → `011`
- **Electronegativity**: 1.78 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 13 → `01101`
- **Vector**: `00110001 1100 011 0 101 01101`

50. Tin (Sn)

- **Atomic Number**: 50 → `00110010`
- **Configuration**: p-block (Group 14) → `1100`
- **Valence Electrons**: 4 → `100`
- **Electronegativity**: 1.96 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 14 → `01110`
- **Vector**: `00110010 1100 100 0 101 01110`

51. Antimony (Sb)

- **Atomic Number**: 51 → `00110011`
- **Configuration**: p-block (Group 15) → `1100`
- **Valence Electrons**: 5 → `101`
- **Electronegativity**: 2.05 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 15 → `01111`
- **Vector**: `00110011 1100 101 0 101 01111`

52. Tellurium (Te)

- **Atomic Number**: 52 → `00110100`
- **Configuration**: p-block (Group 16) → `1100`
- **Valence Electrons**: 6 → `110`
- **Electronegativity**: 2.1 < 2.5 → `0`
- **Period**: 5 → `101`
- **Group**: 16 → `10000`
- **Vector**: `00110100 1100 110 0 101 10000`

53. Iodine (I)

- **Atomic Number**: 53 → `00110101`
- **Configuration**: p-block (Group 17) → `1100`

- **Valence Electrons**: 7 → `111`
- **Electronegativity**: 2.66 ≥ 2.5 → `1`
- **Period**: 5 → `101`
- **Group**: 17 → `10001`
- **Vector**: `00110101 1100 111 1 101 10001`

54. Xenon (Xe)

- **Atomic Number**: 54 → `00110110`
- **Configuration**: p-block (Group 18) → `1100`
- **Valence Electrons**: Noble gas, full shell → `000`
- **Electronegativity**: Undefined, set to 0 → `0`
- **Period**: 5 → `101`
- **Group**: 18 → `10010`
- **Vector**: `00110110 1100 000 0 101 10010`

55. Cesium (Cs)

- **Atomic Number**: 55 → `00110111`
- **Configuration**: s-block (Group 1) → `1000`
- **Valence Electrons**: 1 → `001`
- **Electronegativity**: 0.79 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 1 → `00001`
- **Vector**: `00110111 1000 001 0 110 00001`

56. Barium (Ba)

- **Atomic Number**: 56 → `00111000`
- **Configuration**: s-block (Group 2) → `1000`
- **Valence Electrons**: 2 → `010`
- **Electronegativity**: 0.89 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 2 → `00010`
- **Vector**: `00111000 1000 010 0 110 00010`

57. Lanthanum (La)

- **Atomic Number**: 57 → `00111001`
- **Configuration**: f-block (lanthanides) → `1111`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 1.1 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 3 → `00011`
- **Vector**: `00111001 1111 010 0 110 00011`

58. Cerium (Ce)

- **Atomic Number**: 58 → `00111010`
- **Configuration**: f-block (lanthanides) → `1111`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 1.12 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 3 → `00011`
- **Vector**: `00111010 1111 010 0 110 00011`

59. Praseodymium (Pr)

- **Atomic Number**: 59 → `00111011`
- **Configuration**: f-block (lanthanides) → `1111`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 1.13 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 3 → `00011`
- **Vector**: `00111011 1111 010 0 110 00011`

60. Neodymium (Nd)

- **Atomic Number**: 60 → `00111100`
- **Configuration**: f-block (lanthanides) → `1111`

- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 1.14 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 3 → `00011`
- **Vector**: `00111100 1111 010 0 110 00011`

61. Promethium (Pm)

- **Atomic Number**: 61 → `00111101`
- **Configuration**: f-block (lanthanides) → `1111`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 1.13 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 3 → `00011`
- **Vector**: `00111101 1111 010 0 110 00011`

62. Samarium (Sm)

- **Atomic Number**: 62 → `00111110`
- **Configuration**: f-block (lanthanides) → `1111`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 1.17 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 3 → `00011`
- **Vector**: `00111110 1111 010 0 110 00011`

63. Europium (Eu)

- **Atomic Number**: 63 → `00111111`
- **Configuration**: f-block (lanthanides) → `1111`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 1.2 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 3 → `00011`
- **Vector**: `00111111 1111 010 0 110 00011`

64. Gadolinium (Gd)

- **Atomic Number**: 64 → `01000000`
- **Configuration**: f-block (lanthanides) → `1111`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 1.2 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 3 → `00011`
- **Vector**: `01000000 1111 010 0 110 00011`

65. Terbium (Tb)

- **Atomic Number**: 65 → `01000001`
- **Configuration**: f-block (lanthanides) → `1111`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 1.2 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 3 → `00011`
- **Vector**: `01000001 1111 010 0 110 00011`

66. Dysprosium (Dy)

- **Atomic Number**: 66 → `01000010`
- **Configuration**: f-block (lanthanides) → `1111`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 1.22 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 3 → `00011`
- **Vector**: `01000010 1111 010 0 110 00011`

67. Holmium (Ho)

- **Atomic Number**: 67 → `01000011`
- **Configuration**: f-block (lanthanides) → `1111`

- **Valence Electrons**: 2 ($6s^2$) → `010`
- **Electronegativity**: 1.23 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 3 → `00011`
- **Vector**: `01000011 1111 010 0 110 00011`

68. Erbium (Er)

- **Atomic Number**: 68 → `01000100`
- **Configuration**: f-block (lanthanides) → `1111`
- **Valence Electrons**: 2 ($6s^2$) → `010`
- **Electronegativity**: 1.24 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 3 → `00011`
- **Vector**: `01000100 1111 010 0 110 00011`

69. Thulium (Tm)

- **Atomic Number**: 69 → `01000101`
- **Configuration**: f-block (lanthanides) → `1111`
- **Valence Electrons**: 2 ($6s^2$) → `010`
- **Electronegativity**: 1.25 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 3 → `00011`
- **Vector**: `01000101 1111 010 0 110 00011`

70. Ytterbium (Yb)

- **Atomic Number**: 70 → `01000110`
- **Configuration**: f-block (lanthanides) → `1111`
- **Valence Electrons**: 2 ($6s^2$) → `010`
- **Electronegativity**: 1.1 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 3 → `00011`
- **Vector**: `01000110 1111 010 0 110 00011`

71. Lutetium (Lu)

- **Atomic Number**: 71 → `01000111`
- **Configuration**: f-block (lanthanides) → `1111`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 1.27 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 3 → `00011`
- **Vector**: `01000111 1111 010 0 110 00011`

72. Hafnium (Hf)

- **Atomic Number**: 72 → `01001000`
- **Configuration**: d-block (Group 4) → `1010`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 1.3 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 4 → `00100`
- **Vector**: `01001000 1010 010 0 110 00100`

73. Tantalum (Ta)

- **Atomic Number**: 73 → `01001001`
- **Configuration**: d-block (Group 5) → `1010`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 1.5 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 5 → `00101`
- **Vector**: `01001001 1010 010 0 110 00101`

74. Tungsten (W)

- **Atomic Number**: 74 → `01001010`
- **Configuration**: d-block (Group 6) → `1010`

- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 2.36 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 6 → `00110`
- **Vector**: `01001010 1010 010 0 110 00110`

75. Rhenium (Re)

- **Atomic Number**: 75 → `01001011`
- **Configuration**: d-block (Group 7) → `1010`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 1.9 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 7 → `00111`
- **Vector**: `01001011 1010 010 0 110 00111`

76. Osmium (Os)

- **Atomic Number**: 76 → `01001100`
- **Configuration**: d-block (Group 8) → `1010`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 2.2 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 8 → `01000`
- **Vector**: `01001100 1010 010 0 110 01000`

77. Iridium (Ir)

- **Atomic Number**: 77 → `01001101`
- **Configuration**: d-block (Group 9) → `1010`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 2.2 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 9 → `01001`
- **Vector**: `01001101 1010 010 0 110 01001`

78. Platinum (Pt)

- **Atomic Number**: 78 → `01001110`
- **Configuration**: d-block (Group 10) → `1010`
- **Valence Electrons**: 1 (6s¹ due to exception) → `001`
- **Electronegativity**: 2.28 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 10 → `01010`
- **Vector**: `01001110 1010 001 0 110 01010`

79. Gold (Au)

- **Atomic Number**: 79 → `01001111`
- **Configuration**: d-block (Group 11) → `1010`
- **Valence Electrons**: 1 (6s¹) → `001`
- **Electronegativity**: 2.54 ≥ 2.5 → `1`
- **Period**: 6 → `110`
- **Group**: 11 → `01011`
- **Vector**: `01001111 1010 001 1 110 01011`

80. Mercury (Hg)

- **Atomic Number**: 80 → `01010000`
- **Configuration**: d-block (Group 12) → `1010`
- **Valence Electrons**: 2 (6s²) → `010`
- **Electronegativity**: 2.0 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 12 → `01100`
- **Vector**: `01010000 1010 010 0 110 01100`

81. Thallium (Tl)

- **Atomic Number**: 81 → `01010001`
- **Configuration**: p-block (Group 13) → `1100`

- **Valence Electrons**: 3 → `011`
- **Electronegativity**: 1.62 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 13 → `01101`
- **Vector**: `01010001 1100 011 0 110 01101`

82. Lead (Pb)

- **Atomic Number**: 82 → `01010010`
- **Configuration**: p-block (Group 14) → `1100`
- **Valence Electrons**: 4 → `100`
- **Electronegativity**: 2.33 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 14 → `01110`
- **Vector**: `01010010 1100 100 0 110 01110`

83. Bismuth (Bi)

- **Atomic Number**: 83 → `01010011`
- **Configuration**: p-block (Group 15) → `1100`
- **Valence Electrons**: 5 → `101`
- **Electronegativity**: 2.02 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 15 → `01111`
- **Vector**: `01010011 1100 101 0 110 01111`

84. Polonium (Po)

- **Atomic Number**: 84 → `01010100`
- **Configuration**: p-block (Group 16) → `1100`
- **Valence Electrons**: 6 → `110`
- **Electronegativity**: 2.0 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 16 → `10000`
- **Vector**: `01010100 1100 110 0 110 10000`

85. Astatine (At)

- **Atomic Number**: 85 → `01010101`
- **Configuration**: p-block (Group 17) → `1100`
- **Valence Electrons**: 7 → `111`
- **Electronegativity**: 2.2 < 2.5 → `0`
- **Period**: 6 → `110`
- **Group**: 17 → `10001`
- **Vector**: `01010101 1100 111 0 110 10001`

86. Radon (Rn)

- **Atomic Number**: 86 → `01010110`
- **Configuration**: p-block (Group 18) → `1100`
- **Valence Electrons**: Noble gas, full shell → `000`
- **Electronegativity**: Undefined, set to 0 → `0`
- **Period**: 6 → `110`
- **Group**: 18 → `10010`
- **Vector**: `01010110 1100 000 0 110 10010`

87. Francium (Fr)

- **Atomic Number**: 87 → `01010111`
- **Configuration**: s-block (Group 1) → `1000`
- **Valence Electrons**: 1 → `001`
- **Electronegativity**: 0.7 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 1 → `00001`
- **Vector**: `01010111 1000 001 0 111 00001`

88. Radium (Ra)

- **Atomic Number**: 88 → `01011000`
- **Configuration**: s-block (Group 2) → `1000`

- **Valence Electrons**: 2 → `010`
- **Electronegativity**: 0.9 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 2 → `00010`
- **Vector**: `01011000 1000 010 0 111 00010`

89. Actinium (Ac)

- **Atomic Number**: 89 → `01011001`
- **Configuration**: f-block (actinides) → `1111`
- **Valence Electrons**: 2 ($7s^2$) → `010`
- **Electronegativity**: 1.1 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 3 → `00011`
- **Vector**: `01011001 1111 010 0 111 00011`

90. Thorium (Th)

- **Atomic Number**: 90 → `01011010`
- **Configuration**: f-block (actinides) → `1111`
- **Valence Electrons**: 2 ($7s^2$) → `010`
- **Electronegativity**: 1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 3 → `00011`
- **Vector**: `01011010 1111 010 0 111 00011`

91. Protactinium (Pa)

- **Atomic Number**: 91 → `01011011`
- **Configuration**: f-block (actinides) → `1111`
- **Valence Electrons**: 2 ($7s^2$) → `010`
- **Electronegativity**: 1.5 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 3 → `00011`
- **Vector**: `01011011 1111 010 0 111 00011`

92. Uranium (U)

- **Atomic Number**: 92 → `01011100`
- **Configuration**: f-block (actinides) → `1111`
- **Valence Electrons**: 2 (7s²) → `010`
- **Electronegativity**: 1.38 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 3 → `00011`
- **Vector**: `01011100 1111 010 0 111 00011`

93. Neptunium (Np)

- **Atomic Number**: 93 → `01011101`
- **Configuration**: f-block (actinides) → `1111`
- **Valence Electrons**: 2 (7s²) → `010`
- **Electronegativity**: 1.36 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 3 → `00011`
- **Vector**: `01011101 1111 010 0 111 00011`

94. Plutonium (Pu)

- **Atomic Number**: 94 → `01011110`
- **Configuration**: f-block (actinides) → `1111`
- **Valence Electrons**: 2 (7s²) → `010`
- **Electronegativity**: 1.28 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 3 → `00011`
- **Vector**: `01011110 1111 010 0 111 00011`

95. Americium (Am)

- **Atomic Number**: 95 → `01011111`
- **Configuration**: f-block (actinides) → `1111`

- **Valence Electrons**: 2 ($7s^2$) → `010`
- **Electronegativity**: 1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 3 → `00011`
- **Vector**: `01011111 1111 010 0 111 00011`

96. Curium (Cm)

- **Atomic Number**: 96 → `01100000`
- **Configuration**: f-block (actinides) → `1111`
- **Valence Electrons**: 2 ($7s^2$) → `010`
- **Electronegativity**: 1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 3 → `00011`
- **Vector**: `01100000 1111 010 0 111 00011`

97. Berkelium (Bk)

- **Atomic Number**: 97 → `01100001`
- **Configuration**: f-block (actinides) → `1111`
- **Valence Electrons**: 2 ($7s^2$) → `010`
- **Electronegativity**: 1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 3 → `00011`
- **Vector**: `01100001 1111 010 0 111 00011`

98. Californium (Cf)

- **Atomic Number**: 98 → `01100010`
- **Configuration**: f-block (actinides) → `1111`
- **Valence Electrons**: 2 ($7s^2$) → `010`
- **Electronegativity**: 1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 3 → `00011`
- **Vector**: `01100010 1111 010 0 111 00011`

99. Einsteinium (Es)

- **Atomic Number**: 99 → `01100011`
- **Configuration**: f-block (actinides) → `1111`
- **Valence Electrons**: 2 ($7s^2$) → `010`
- **Electronegativity**: 1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 3 → `00011`
- **Vector**: `01100011 1111 010 0 111 00011`

100. Fermium (Fm)

- **Atomic Number**: 100 → `01100100`
- **Configuration**: f-block (actinides) → `1111`
- **Valence Electrons**: 2 ($7s^2$) → `010`
- **Electronegativity**: 1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 3 → `00011`
- **Vector**: `01100100 1111 010 0 111 00011`

101. Mendelevium (Md)

- **Atomic Number**: 101 → `01100101`
- **Configuration**: f-block (actinides) → `1111`
- **Valence Electrons**: 2 ($7s^2$) → `010`
- **Electronegativity**: 1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 3 → `00011`
- **Vector**: `01100101 1111 010 0 111 00011`

102. Nobelium (No)

- **Atomic Number**: 102 → `01100110`
- **Configuration**: f-block (actinides) → `1111`

- **Valence Electrons**: 2 ($7s^2$) → `010`
- **Electronegativity**: 1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 3 → `00011`
- **Vector**: `01100110 1111 010 0 111 00011`

103. Lawrencium (Lr)

- **Atomic Number**: 103 → `01100111`
- **Configuration**: f-block (actinides) → `1111`
- **Valence Electrons**: 2 ($7s^2$) → `010`
- **Electronegativity**: 1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 3 → `00011`
- **Vector**: `01100111 1111 010 0 111 00011`

104. Rutherfordium (Rf)

- **Atomic Number**: 104 → `01101000`
- **Configuration**: d-block (Group 4) → `1010`
- **Valence Electrons**: 2 ($7s^2$) → `010`
- **Electronegativity**: Estimated ~1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 4 → `00100`
- **Vector**: `01101000 1010 010 0 111 00100`

105. Dubnium (Db)

- **Atomic Number**: 105 → `01101001`
- **Configuration**: d-block (Group 5) → `1010`
- **Valence Electrons**: 2 ($7s^2$) → `010`
- **Electronegativity**: Estimated ~1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 5 → `00101`
- **Vector**: `01101001 1010 010 0 111 00101`

106. Seaborgium (Sg)

- **Atomic Number**: 106 → `01101010`
- **Configuration**: d-block (Group 6) → `1010`
- **Valence Electrons**: 2 (7s²) → `010`
- **Electronegativity**: Estimated ~1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 6 → `00110`
- **Vector**: `01101010 1010 010 0 111 00110`

107. Bohrium (Bh)

- **Atomic Number**: 107 → `01101011`
- **Configuration**: d-block (Group 7) → `1010`
- **Valence Electrons**: 2 (7s²) → `010`
- **Electronegativity**: Estimated ~1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 7 → `00111`
- **Vector**: `01101011 1010 010 0 111 00111`

108. Hassium (Hs)

- **Atomic Number**: 108 → `01101100`
- **Configuration**: d-block (Group 8) → `1010`
- **Valence Electrons**: 2 (7s²) → `010`
- **Electronegativity**: Estimated ~1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 8 → `01000`
- **Vector**: `01101100 1010 010 0 111 01000`

109. Meitnerium (Mt)

- **Atomic Number**: 109 → `01101101`
- **Configuration**: d-block (Group 9) → `1010`

- **Valence Electrons**: 2 (7s²) → `010`
- **Electronegativity**: Estimated ~1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 9 → `01001`
- **Vector**: `01101101 1010 010 0 111 01001`

110. Darmstadtium (Ds)

- **Atomic Number**: 110 → `01101110`
- **Configuration**: d-block (Group 10) → `1010`
- **Valence Electrons**: 2 (7s²) → `010`
- **Electronegativity**: Estimated ~1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 10 → `01010`
- **Vector**: `01101110 1010 010 0 111 01010`

111. Roentgenium (Rg)

- **Atomic Number**: 111 → `01101111`
- **Configuration**: d-block (Group 11) → `1010`
- **Valence Electrons**: 2 (7s²) → `010`
- **Electronegativity**: Estimated ~1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 11 → `01011`
- **Vector**: `01101111 1010 010 0 111 01011`

112. Copernicium (Cn)

- **Atomic Number**: 112 → `01110000`
- **Configuration**: d-block (Group 12) → `1010`
- **Valence Electrons**: 2 (7s²) → `010`
- **Electronegativity**: Estimated ~1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 12 → `01100`
- **Vector**: `01110000 1010 010 0 111 01100`

113. Nihonium (Nh)

- **Atomic Number**: 113 → `01110001`
- **Configuration**: p-block (Group 13) → `1100`
- **Valence Electrons**: 3 → `011`
- **Electronegativity**: Estimated ~1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 13 → `01101`
- **Vector**: `01110001 1100 011 0 111 01101`

114. Flerovium (Fl)

- **Atomic Number**: 114 → `01110010`
- **Configuration**: p-block (Group 14) → `1100`
- **Valence Electrons**: 4 → `100`
- **Electronegativity**: Estimated ~1.3 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 14 → `01110`
- **Vector**: `01110010 1100 100 0 111 01110`

115. Moscovium (Mc)

- **Atomic Number**: 115 → `01110011`
- **Configuration**: p-block (Group 15) → `1100`
- **Valence Electrons**: 5 → `101`
- **Electronegativity**: Estimated ~1.5 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 15 → `01111`
- **Vector**: `01110011 1100 101 0 111 01111`

116. Livermorium (Lv)

- **Atomic Number**: 116 → `01110100`
- **Configuration**: p-block (Group 16) → `1100`

- **Valence Electrons**: 6 → `110`
- **Electronegativity**: Estimated ~1.5 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 16 → `10000`
- **Vector**: `01110100 1100 110 0 111 10000`

117. Tennessine (Ts)

- **Atomic Number**: 117 → `01110101`
- **Configuration**: p-block (Group 17) → `1100`
- **Valence Electrons**: 7 → `111`
- **Electronegativity**: Estimated ~2.1 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 17 → `10001`
- **Vector**: `01110101 1100 111 0 111 10001`

118. Oganesson (Og)

- **Atomic Number**: 118 → `01110110`
- **Configuration**: p-block (Group 18) → `1100`
- **Valence Electrons**: Noble gas, full shell → `000`
- **Electronegativity**: Estimated ~2.0 < 2.5 → `0`
- **Period**: 7 → `111`
- **Group**: 18 → `10010`
- **Vector**: `01110110 1100 000 0 111 10010`