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Modul:Unicode data/scripts

This module contains data that is used by [Module:Unicode data](#) to determine the Unicode script code for a code point and to determine if a Unicode script is written right-to-left. The right-to-left script data is sourced from [Module:Lang/data](#). The main table in the module is generated by [Module:Unicode data/scripts/make](#) from [Scripts.txt](#) and [PropertyValueAliases.txt](#) in the Unicode Character Database (version 14.0).

```
--[=  
-- Official Unicode script values for individual codepoints and ranges of  
-- codepoints.  
  
-- https://www.unicode.org/Public/UNIDATA/Scripts.txt provided  
-- the script names, and https://www.unicode.org/Public/UNIDATA/PropertyValueAliases.txt  
-- provided script codes corresponding to the names (see [[Script (Unicode)]]).  
--]=]  
  
local data = {  
    singles = {  
        [0x000AA] = "Latn",  
        [0x000BA] = "Latn",  
        [0x000D7] = "Zyyy",  
        [0x000F7] = "Zyyy",  
        [0x00374] = "Zyyy",  
        [0x0037E] = "Zyyy",  
        [0x0037F] = "Grek",  
        [0x00384] = "Grek",  
        [0x00385] = "Zyyy",  
        [0x00386] = "Grek",  
        [0x00387] = "Zyyy",  
        [0x0038C] = "Grek",  
        [0x00605] = "Zyyy",  
        [0x0060C] = "Zyyy",  
        [0x0061B] = "Zyyy",  
        [0x0061F] = "Zyyy",  
        [0x00640] = "Zyyy",  
        [0x00670] = "Zinh",  
        [0x006DD] = "Zyyy",  
        [0x0085E] = "Mand",  
        [0x008E2] = "Zyyy",  
        [0x009B2] = "Beng",  
        [0x009D7] = "Beng",  
        [0x00A3C] = "Guru",  
        [0x00A51] = "Guru",  
        [0x00A5E] = "Guru",  
        [0x00AD0] = "Gujr",  
        [0x00B9C] = "Taml",  
        [0x00BD0] = "Taml",  
        [0x00BD7] = "Taml",  
        [0x00C5D] = "Telu",  
        [0x00DBD] = "Sinh",  
        [0x00DCA] = "Sinh",  
        [0x00DD6] = "Sinh",  
        [0x00E3F] = "Zyyy",  
        [0x00E84] = "Laoo",  
        [0x00EA5] = "Laoo",
```



```
[0x00EC6] = "Laoo",  
[0x010C7] = "Geor",  
[0x010CD] = "Geor",  
[0x010FB] = "Zyyy",  
[0x01258] = "Ethi",  
[0x012C0] = "Ethi",  
[0x0171F] = "Tglg",  
[0x01804] = "Mong",  
[0x01805] = "Zyyy",  
[0x01940] = "Limb",  
[0x01CD3] = "Zyyy",  
[0x01CE1] = "Zyyy",  
[0x01CED] = "Zinh",  
[0x01CF4] = "Zinh",  
[0x01CFA] = "Zyyy",  
[0x01D2B] = "Cyrł",  
[0x01D78] = "Cyrł",  
[0x01DBF] = "Grek",  
[0x01F59] = "Grek",  
[0x01F5B] = "Grek",  
[0x01F5D] = "Grek",  
[0x02071] = "Latn",  
[0x0207F] = "Latn",  
[0x02126] = "Grek",  
[0x02132] = "Latn",  
[0x0214E] = "Latn",  
[0x02D27] = "Geor",  
[0x02D2D] = "Geor",  
[0x02D7F] = "Tfng",  
[0x03005] = "Hani",  
[0x03006] = "Zyyy",  
[0x03007] = "Hani",  
[0x030A0] = "Zyyy",  
[0x032FF] = "Zyyy",  
[0x0A7D3] = "Latn",  
[0x0A92E] = "Zyyy",  
[0x0A92F] = "Kali",  
[0x0A95F] = "Rjng",  
[0x0A9CF] = "Zyyy",  
[0x0AB5B] = "Zyyy",  
[0x0AB65] = "Grek",  
[0x0FB3E] = "Hebr",  
[0x0FDCF] = "Arab",  
[0x0FEFF] = "Zyyy",  
[0x0FF70] = "Zyyy",  
[0x101A0] = "Grek",  
[0x101FD] = "Zinh",  
[0x102E0] = "Zinh",  
[0x1039F] = "Ugar",  
[0x1056F] = "Aghb",  
[0x10808] = "Cprt",  
[0x1083C] = "Cprt",  
[0x1083F] = "Cprt",  
[0x1091F] = "Phnx",  
[0x1093F] = "Lydi",  
[0x1107F] = "Brah",  
[0x110CD] = "Kthi",  
[0x11288] = "Mult",  
[0x1133B] = "Zinh",  
[0x11350] = "Gran",  
[0x11357] = "Gran",  
[0x118FF] = "Wara",  
[0x11909] = "Diak",  
[0x11D3A] = "Gonm",
```



```
[0x11FB0] = "Lisu",
[0x11FFF] = "Taml",
[0x16FE0] = "Tang",
[0x16FE1] = "Nshu",
[0x16FE4] = "Kits",
[0x1B000] = "Kana",
[0x1D4A2] = "Zyyy",
[0x1D4BB] = "Zyyy",
[0x1D546] = "Zyyy",
[0x1E2FF] = "Wcho",
[0x1EE24] = "Arab",
[0x1EE27] = "Arab",
[0x1EE39] = "Arab",
[0x1EE3B] = "Arab",
[0x1EE42] = "Arab",
[0x1EE47] = "Arab",
[0x1EE49] = "Arab",
[0x1EE4B] = "Arab",
[0x1EE54] = "Arab",
[0x1EE57] = "Arab",
[0x1EE59] = "Arab",
[0x1EE5B] = "Arab",
[0x1EE5D] = "Arab",
[0x1EE5F] = "Arab",
[0x1EE64] = "Arab",
[0x1EE7E] = "Arab",
[0x1F200] = "Hira",
[0x1F7F0] = "Zyyy",
[0xE0001] = "Zyyy",
},
ranges = {
  { 0x00000, 0x00040, "Zyyy" },
  { 0x00041, 0x0005A, "Latn" },
  { 0x0005B, 0x00060, "Zyyy" },
  { 0x00061, 0x0007A, "Latn" },
  { 0x0007B, 0x000A9, "Zyyy" },
  { 0x000AB, 0x000B9, "Zyyy" },
  { 0x000BB, 0x000BF, "Zyyy" },
  { 0x000C0, 0x000D6, "Latn" },
  { 0x000D8, 0x000F6, "Latn" },
  { 0x000F8, 0x002B8, "Latn" },
  { 0x002B9, 0x002DF, "Zyyy" },
  { 0x002E0, 0x002E4, "Latn" },
  { 0x002E5, 0x002E9, "Zyyy" },
  { 0x002EA, 0x002EB, "Bopo" },
  { 0x002EC, 0x002FF, "Zyyy" },
  { 0x00300, 0x0036F, "Zinh" },
  { 0x00370, 0x00373, "Grek" },
  { 0x00375, 0x00377, "Grek" },
  { 0x0037A, 0x0037D, "Grek" },
  { 0x00388, 0x0038A, "Grek" },
  { 0x0038E, 0x003A1, "Grek" },
  { 0x003A3, 0x003E1, "Grek" },
  { 0x003E2, 0x003EF, "Copt" },
  { 0x003F0, 0x003FF, "Grek" },
  { 0x00400, 0x00484, "Cyrł" },
  { 0x00485, 0x00486, "Zinh" },
  { 0x00487, 0x0052F, "Cyrł" },
  { 0x00531, 0x00556, "Armn" },
  { 0x00559, 0x0058A, "Armn" },
  { 0x0058D, 0x0058F, "Armn" },
  { 0x00591, 0x005C7, "Hebr" },
  { 0x005D0, 0x005EA, "Hebr" },
}
```



```
{ 0x005EF, 0x005F4, "Hebr" },
{ 0x00600, 0x00604, "Arab" },
{ 0x00606, 0x0060B, "Arab" },
{ 0x0060D, 0x0061A, "Arab" },
{ 0x0061C, 0x0061E, "Arab" },
{ 0x00620, 0x0063F, "Arab" },
{ 0x00641, 0x0064A, "Arab" },
{ 0x0064B, 0x00655, "Zinh" },
{ 0x00656, 0x0066F, "Arab" },
{ 0x00671, 0x006DC, "Arab" },
{ 0x006DE, 0x006FF, "Arab" },
{ 0x00700, 0x0070D, "Syrc" },
{ 0x0070F, 0x0074A, "Syrc" },
{ 0x0074D, 0x0074F, "Syrc" },
{ 0x00750, 0x0077F, "Arab" },
{ 0x00780, 0x007B1, "Thaa" },
{ 0x007C0, 0x007FA, "Nkoo" },
{ 0x007FD, 0x007FF, "Nkoo" },
{ 0x00800, 0x0082D, "Samr" },
{ 0x00830, 0x0083E, "Samr" },
{ 0x00840, 0x0085B, "Mand" },
{ 0x00860, 0x0086A, "Syrc" },
{ 0x00870, 0x0088E, "Arab" },
{ 0x00890, 0x00891, "Arab" },
{ 0x00898, 0x008E1, "Arab" },
{ 0x008E3, 0x008FF, "Arab" },
{ 0x00900, 0x00950, "Deva" },
{ 0x00951, 0x00954, "Zinh" },
{ 0x00955, 0x00963, "Deva" },
{ 0x00964, 0x00965, "Zyyy" },
{ 0x00966, 0x0097F, "Deva" },
{ 0x00980, 0x00983, "Beng" },
{ 0x00985, 0x0098C, "Beng" },
{ 0x0098F, 0x00990, "Beng" },
{ 0x00993, 0x009A8, "Beng" },
{ 0x009AA, 0x009B0, "Beng" },
{ 0x009B6, 0x009B9, "Beng" },
{ 0x009BC, 0x009C4, "Beng" },
{ 0x009C7, 0x009C8, "Beng" },
{ 0x009CB, 0x009CE, "Beng" },
{ 0x009DC, 0x009DD, "Beng" },
{ 0x009DF, 0x009E3, "Beng" },
{ 0x009E6, 0x009FE, "Beng" },
{ 0x00A01, 0x00A03, "Guru" },
{ 0x00A05, 0x00A0A, "Guru" },
{ 0x00A0F, 0x00A10, "Guru" },
{ 0x00A13, 0x00A28, "Guru" },
{ 0x00A2A, 0x00A30, "Guru" },
{ 0x00A32, 0x00A33, "Guru" },
{ 0x00A35, 0x00A36, "Guru" },
{ 0x00A38, 0x00A39, "Guru" },
{ 0x00A3E, 0x00A42, "Guru" },
{ 0x00A47, 0x00A48, "Guru" },
{ 0x00A4B, 0x00A4D, "Guru" },
{ 0x00A59, 0x00A5C, "Guru" },
{ 0x00A66, 0x00A76, "Guru" },
{ 0x00A81, 0x00A83, "Gujr" },
{ 0x00A85, 0x00A8D, "Gujr" },
{ 0x00A8F, 0x00A91, "Gujr" },
{ 0x00A93, 0x00AA8, "Gujr" },
{ 0x00AAA, 0x00AB0, "Gujr" },
{ 0x00AB2, 0x00AB3, "Gujr" },
{ 0x00AB5, 0x00AB9, "Gujr" },
{ 0x00ABC, 0x00AC5, "Gujr" },
```



```
{ 0x00AC7, 0x00AC9, "Gujr" },
{ 0x00ACB, 0x00ACD, "Gujr" },
{ 0x00AE0, 0x00AE3, "Gujr" },
{ 0x00AE6, 0x00AF1, "Gujr" },
{ 0x00AF9, 0x00AFF, "Gujr" },
{ 0x00B01, 0x00B03, "Orya" },
{ 0x00B05, 0x00B0C, "Orya" },
{ 0x00B0F, 0x00B10, "Orya" },
{ 0x00B13, 0x00B28, "Orya" },
{ 0x00B2A, 0x00B30, "Orya" },
{ 0x00B32, 0x00B33, "Orya" },
{ 0x00B35, 0x00B39, "Orya" },
{ 0x00B3C, 0x00B44, "Orya" },
{ 0x00B47, 0x00B48, "Orya" },
{ 0x00B4B, 0x00B4D, "Orya" },
{ 0x00B55, 0x00B57, "Orya" },
{ 0x00B5C, 0x00B5D, "Orya" },
{ 0x00B5F, 0x00B63, "Orya" },
{ 0x00B66, 0x00B77, "Orya" },
{ 0x00B82, 0x00B83, "Taml" },
{ 0x00B85, 0x00B8A, "Taml" },
{ 0x00B8E, 0x00B90, "Taml" },
{ 0x00B92, 0x00B95, "Taml" },
{ 0x00B99, 0x00B9A, "Taml" },
{ 0x00B9E, 0x00B9F, "Taml" },
{ 0x00BA3, 0x00BA4, "Taml" },
{ 0x00BA8, 0x00BAA, "Taml" },
{ 0x00BAE, 0x00BB9, "Taml" },
{ 0x00BBE, 0x00BC2, "Taml" },
{ 0x00BC6, 0x00BC8, "Taml" },
{ 0x00BCA, 0x00BCD, "Taml" },
{ 0x00BE6, 0x00BFA, "Taml" },
{ 0x00C00, 0x00C0C, "Telu" },
{ 0x00C0E, 0x00C10, "Telu" },
{ 0x00C12, 0x00C28, "Telu" },
{ 0x00C2A, 0x00C39, "Telu" },
{ 0x00C3C, 0x00C44, "Telu" },
{ 0x00C46, 0x00C48, "Telu" },
{ 0x00C4A, 0x00C4D, "Telu" },
{ 0x00C55, 0x00C56, "Telu" },
{ 0x00C58, 0x00C5A, "Telu" },
{ 0x00C60, 0x00C63, "Telu" },
{ 0x00C66, 0x00C6F, "Telu" },
{ 0x00C77, 0x00C7F, "Telu" },
{ 0x00C80, 0x00C8C, "Knda" },
{ 0x00C8E, 0x00C90, "Knda" },
{ 0x00C92, 0x00CA8, "Knda" },
{ 0x00CAA, 0x00CB3, "Knda" },
{ 0x00CB5, 0x00CB9, "Knda" },
{ 0x00CBC, 0x00CC4, "Knda" },
{ 0x00CC6, 0x00CC8, "Knda" },
{ 0x00CCA, 0x00CCD, "Knda" },
{ 0x00CD5, 0x00CD6, "Knda" },
{ 0x00CDD, 0x00CDE, "Knda" },
{ 0x00CE0, 0x00CE3, "Knda" },
{ 0x00CE6, 0x00CEF, "Knda" },
{ 0x00CF1, 0x00CF2, "Knda" },
{ 0x00D00, 0x00D0C, "Mlym" },
{ 0x00D0E, 0x00D10, "Mlym" },
{ 0x00D12, 0x00D44, "Mlym" },
{ 0x00D46, 0x00D48, "Mlym" },
{ 0x00D4A, 0x00D4F, "Mlym" },
{ 0x00D54, 0x00D63, "Mlym" },
{ 0x00D66, 0x00D7F, "Mlym" },
```



```
{ 0x00D81, 0x00D83, "Sinh" },
{ 0x00D85, 0x00D96, "Sinh" },
{ 0x00D9A, 0x00DB1, "Sinh" },
{ 0x00DB3, 0x00DBB, "Sinh" },
{ 0x00DC0, 0x00DC6, "Sinh" },
{ 0x00DCF, 0x00DD4, "Sinh" },
{ 0x00DD8, 0x00DDF, "Sinh" },
{ 0x00DE6, 0x00DEF, "Sinh" },
{ 0x00DF2, 0x00DF4, "Sinh" },
{ 0x00E01, 0x00E3A, "Thai" },
{ 0x00E40, 0x00E5B, "Thai" },
{ 0x00E81, 0x00E82, "Lao" },
{ 0x00E86, 0x00E8A, "Lao" },
{ 0x00E8C, 0x00EA3, "Lao" },
{ 0x00EA7, 0x00EBD, "Lao" },
{ 0x00EC0, 0x00EC4, "Lao" },
{ 0x00EC8, 0x00ECD, "Lao" },
{ 0x00ED0, 0x00ED9, "Lao" },
{ 0x00EDC, 0x00EDF, "Lao" },
{ 0x00F00, 0x00F47, "Tibt" },
{ 0x00F49, 0x00F6C, "Tibt" },
{ 0x00F71, 0x00F97, "Tibt" },
{ 0x00F99, 0x00FBC, "Tibt" },
{ 0x00FBE, 0x00FCC, "Tibt" },
{ 0x00FCE, 0x00FD4, "Tibt" },
{ 0x00FD5, 0x00FD8, "Zyyy" },
{ 0x00FD9, 0x00FDA, "Tibt" },
{ 0x01000, 0x0109F, "Mymr" },
{ 0x010A0, 0x010C5, "Geor" },
{ 0x010D0, 0x010FA, "Geor" },
{ 0x010FC, 0x010FF, "Geor" },
{ 0x01100, 0x011FF, "Hang" },
{ 0x01200, 0x01248, "Ethi" },
{ 0x0124A, 0x0124D, "Ethi" },
{ 0x01250, 0x01256, "Ethi" },
{ 0x0125A, 0x0125D, "Ethi" },
{ 0x01260, 0x01288, "Ethi" },
{ 0x0128A, 0x0128D, "Ethi" },
{ 0x01290, 0x012B0, "Ethi" },
{ 0x012B2, 0x012B5, "Ethi" },
{ 0x012B8, 0x012BE, "Ethi" },
{ 0x012C2, 0x012C5, "Ethi" },
{ 0x012C8, 0x012D6, "Ethi" },
{ 0x012D8, 0x01310, "Ethi" },
{ 0x01312, 0x01315, "Ethi" },
{ 0x01318, 0x0135A, "Ethi" },
{ 0x0135D, 0x0137C, "Ethi" },
{ 0x01380, 0x01399, "Ethi" },
{ 0x013A0, 0x013F5, "Cher" },
{ 0x013F8, 0x013FD, "Cher" },
{ 0x01400, 0x0167F, "Cans" },
{ 0x01680, 0x0169C, "Ogam" },
{ 0x016A0, 0x016EA, "Runr" },
{ 0x016EB, 0x016ED, "Zyyy" },
{ 0x016EE, 0x016F8, "Runr" },
{ 0x01700, 0x01715, "Tglg" },
{ 0x01720, 0x01734, "Hano" },
{ 0x01735, 0x01736, "Zyyy" },
{ 0x01740, 0x01753, "Buhd" },
{ 0x01760, 0x0176C, "Tagb" },
{ 0x0176E, 0x01770, "Tagb" },
{ 0x01772, 0x01773, "Tagb" },
{ 0x01780, 0x017DD, "Khmr" },
{ 0x017E0, 0x017E9, "Khmr" }
```



```
{ 0x017F0, 0x017F9, "Khmr" },
{ 0x01800, 0x01801, "Mong" },
{ 0x01802, 0x01803, "Zyyy" },
{ 0x01806, 0x01819, "Mong" },
{ 0x01820, 0x01878, "Mong" },
{ 0x01880, 0x018AA, "Mong" },
{ 0x018B0, 0x018F5, "Cans" },
{ 0x01900, 0x0191E, "Limb" },
{ 0x01920, 0x0192B, "Limb" },
{ 0x01930, 0x0193B, "Limb" },
{ 0x01944, 0x0194F, "Limb" },
{ 0x01950, 0x0196D, "Tale" },
{ 0x01970, 0x01974, "Tale" },
{ 0x01980, 0x019AB, "Talu" },
{ 0x019B0, 0x019C9, "Talu" },
{ 0x019D0, 0x019DA, "Talu" },
{ 0x019DE, 0x019DF, "Talu" },
{ 0x019E0, 0x019FF, "Khmr" },
{ 0x01A00, 0x01A1B, "Bugi" },
{ 0x01A1E, 0x01A1F, "Bugi" },
{ 0x01A20, 0x01A5E, "Lana" },
{ 0x01A60, 0x01A7C, "Lana" },
{ 0x01A7F, 0x01A89, "Lana" },
{ 0x01A90, 0x01A99, "Lana" },
{ 0x01AA0, 0x01AAD, "Lana" },
{ 0x01AB0, 0x01ACE, "Zinh" },
{ 0x01B00, 0x01B4C, "Bali" },
{ 0x01B50, 0x01B7E, "Bali" },
{ 0x01B80, 0x01BBF, "Sund" },
{ 0x01BC0, 0x01BF3, "Batk" },
{ 0x01BFC, 0x01BFF, "Batk" },
{ 0x01C00, 0x01C37, "Lepc" },
{ 0x01C3B, 0x01C49, "Lepc" },
{ 0x01C4D, 0x01C4F, "Lepc" },
{ 0x01C50, 0x01C7F, "Olck" },
{ 0x01C80, 0x01C88, "Cyr1" },
{ 0x01C90, 0x01CBA, "Geor" },
{ 0x01CBD, 0x01CBF, "Geor" },
{ 0x01CC0, 0x01CC7, "Sund" },
{ 0x01CD0, 0x01CD2, "Zinh" },
{ 0x01CD4, 0x01CE0, "Zinh" },
{ 0x01CE2, 0x01CE8, "Zinh" },
{ 0x01CE9, 0x01CEC, "Zyyy" },
{ 0x01CEE, 0x01CF3, "Zyyy" },
{ 0x01CF5, 0x01CF7, "Zyyy" },
{ 0x01CF8, 0x01CF9, "Zinh" },
{ 0x01D00, 0x01D25, "Latn" },
{ 0x01D26, 0x01D2A, "Grek" },
{ 0x01D2C, 0x01D5C, "Latn" },
{ 0x01D5D, 0x01D61, "Grek" },
{ 0x01D62, 0x01D65, "Latn" },
{ 0x01D66, 0x01D6A, "Grek" },
{ 0x01D6B, 0x01D77, "Latn" },
{ 0x01D79, 0x01DBE, "Latn" },
{ 0x01DC0, 0x01DFF, "Zinh" },
{ 0x01E00, 0x01EFF, "Latn" },
{ 0x01F00, 0x01F15, "Grek" },
{ 0x01F18, 0x01F1D, "Grek" },
{ 0x01F20, 0x01F45, "Grek" },
{ 0x01F48, 0x01F4D, "Grek" },
{ 0x01F50, 0x01F57, "Grek" },
{ 0x01F5F, 0x01F7D, "Grek" },
{ 0x01F80, 0x01FB4, "Grek" },
{ 0x01FB6, 0x01FC4, "Grek" }
```



```
{ 0x01FC6, 0x01FD3, "Grek" },
{ 0x01FD6, 0x01FDB, "Grek" },
{ 0x01FDD, 0x01FEF, "Grek" },
{ 0x01FF2, 0x01FF4, "Grek" },
{ 0x01FF6, 0x01FFE, "Grek" },
{ 0x02000, 0x0200B, "Zyyy" },
{ 0x0200C, 0x0200D, "Zinh" },
{ 0x0200E, 0x02064, "Zyyy" },
{ 0x02066, 0x02070, "Zyyy" },
{ 0x02074, 0x0207E, "Zyyy" },
{ 0x02080, 0x0208E, "Zyyy" },
{ 0x02090, 0x0209C, "Latn" },
{ 0x020A0, 0x020C0, "Zyyy" },
{ 0x020D0, 0x020F0, "Zinh" },
{ 0x02100, 0x02125, "Zyyy" },
{ 0x02127, 0x02129, "Zyyy" },
{ 0x0212A, 0x0212B, "Latn" },
{ 0x0212C, 0x02131, "Zyyy" },
{ 0x02133, 0x0214D, "Zyyy" },
{ 0x0214F, 0x0215F, "Zyyy" },
{ 0x02160, 0x02188, "Latn" },
{ 0x02189, 0x0218B, "Zyyy" },
{ 0x02190, 0x02426, "Zyyy" },
{ 0x02440, 0x0244A, "Zyyy" },
{ 0x02460, 0x027FF, "Zyyy" },
{ 0x02800, 0x028FF, "Brai" },
{ 0x02900, 0x02B73, "Zyyy" },
{ 0x02B76, 0x02B95, "Zyyy" },
{ 0x02B97, 0x02BFF, "Zyyy" },
{ 0x02C00, 0x02C5F, "Glag" },
{ 0x02C60, 0x02C7F, "Latn" },
{ 0x02C80, 0x02CF3, "Copt" },
{ 0x02CF9, 0x02CFF, "Copt" },
{ 0x02D00, 0x02D25, "Geor" },
{ 0x02D30, 0x02D67, "Tfng" },
{ 0x02D6F, 0x02D70, "Tfng" },
{ 0x02D80, 0x02D96, "Ethi" },
{ 0x02DA0, 0x02DA6, "Ethi" },
{ 0x02DA8, 0x02DAE, "Ethi" },
{ 0x02DB0, 0x02DB6, "Ethi" },
{ 0x02DB8, 0x02DBE, "Ethi" },
{ 0x02DC0, 0x02DC6, "Ethi" },
{ 0x02DC8, 0x02DCE, "Ethi" },
{ 0x02DD0, 0x02DD6, "Ethi" },
{ 0x02DD8, 0x02DDE, "Ethi" },
{ 0x02DE0, 0x02DFF, "Cyr1" },
{ 0x02E00, 0x02E5D, "Zyyy" },
{ 0x02E80, 0x02E99, "Hani" },
{ 0x02E9B, 0x02EF3, "Hani" },
{ 0x02F00, 0x02FD5, "Hani" },
{ 0x02FF0, 0x02FFB, "Zyyy" },
{ 0x03000, 0x03004, "Zyyy" },
{ 0x03008, 0x03020, "Zyyy" },
{ 0x03021, 0x03029, "Hani" },
{ 0x0302A, 0x0302D, "Zinh" },
{ 0x0302E, 0x0302F, "Hang" },
{ 0x03030, 0x03037, "Zyyy" },
{ 0x03038, 0x0303B, "Hani" },
{ 0x0303C, 0x0303F, "Zyyy" },
{ 0x03041, 0x03096, "Hira" },
{ 0x03099, 0x0309A, "Zinh" },
{ 0x0309B, 0x0309C, "Zyyy" },
{ 0x0309D, 0x0309F, "Hira" },
{ 0x030A1, 0x030FA, "Kana" },
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{ 0x030FB, 0x030FC, "Zyyy" },
{ 0x030FD, 0x030FF, "Kana" },
{ 0x03105, 0x0312F, "Bopo" },
{ 0x03131, 0x0318E, "Hang" },
{ 0x03190, 0x0319F, "Zyyy" },
{ 0x031A0, 0x031BF, "Bopo" },
{ 0x031C0, 0x031E3, "Zyyy" },
{ 0x031F0, 0x031FF, "Kana" },
{ 0x03200, 0x0321E, "Hang" },
{ 0x03220, 0x0325F, "Zyyy" },
{ 0x03260, 0x0327E, "Hang" },
{ 0x0327F, 0x032CF, "Zyyy" },
{ 0x032D0, 0x032FE, "Kana" },
{ 0x03300, 0x03357, "Kana" },
{ 0x03358, 0x033FF, "Zyyy" },
{ 0x03400, 0x04DBF, "Hani" },
{ 0x04DC0, 0x04DFF, "Zyyy" },
{ 0x04E00, 0x09FFF, "Hani" },
{ 0x0A000, 0x0A48C, "Yiii" },
{ 0x0A490, 0x0A4C6, "Yiii" },
{ 0x0A4D0, 0x0A4FF, "Lisu" },
{ 0x0A500, 0x0A62B, "Vaii" },
{ 0x0A640, 0x0A69F, "Cyrl" },
{ 0x0A6A0, 0x0A6F7, "Bamu" },
{ 0x0A700, 0x0A721, "Zyyy" },
{ 0x0A722, 0x0A787, "Latn" },
{ 0x0A788, 0x0A78A, "Zyyy" },
{ 0x0A78B, 0x0A7CA, "Latn" },
{ 0x0A7D0, 0x0A7D1, "Latn" },
{ 0x0A7D5, 0x0A7D9, "Latn" },
{ 0x0A7F2, 0x0A7FF, "Latn" },
{ 0x0A800, 0x0A82C, "Sylo" },
{ 0x0A830, 0x0A839, "Zyyy" },
{ 0x0A840, 0x0A877, "Phag" },
{ 0x0A880, 0x0A8C5, "Saur" },
{ 0x0A8CE, 0x0A8D9, "Saur" },
{ 0x0A8E0, 0x0A8FF, "Deva" },
{ 0x0A900, 0x0A92D, "Kali" },
{ 0x0A930, 0x0A953, "Rjng" },
{ 0x0A960, 0x0A97C, "Hang" },
{ 0x0A980, 0x0A9CD, "Java" },
{ 0x0A9D0, 0x0A9D9, "Java" },
{ 0x0A9DE, 0x0A9DF, "Java" },
{ 0x0A9E0, 0x0A9FE, "Mymr" },
{ 0x0AA00, 0x0AA36, "Cham" },
{ 0x0AA40, 0x0AA4D, "Cham" },
{ 0x0AA50, 0x0AA59, "Cham" },
{ 0x0AA5C, 0x0AA5F, "Cham" },
{ 0x0AA60, 0x0AA7F, "Mymr" },
{ 0x0AA80, 0x0AAC2, "Tavt" },
{ 0x0AADB, 0x0AADF, "Tavt" },
{ 0x0AAE0, 0x0AAF6, "Mtei" },
{ 0x0AB01, 0x0AB06, "Ethi" },
{ 0x0AB09, 0x0AB0E, "Ethi" },
{ 0x0AB11, 0x0AB16, "Ethi" },
{ 0x0AB20, 0x0AB26, "Ethi" },
{ 0x0AB28, 0x0AB2E, "Ethi" },
{ 0x0AB30, 0x0AB5A, "Latn" },
{ 0x0AB5C, 0x0AB64, "Latn" },
{ 0x0AB66, 0x0AB69, "Latn" },
{ 0x0AB6A, 0x0AB6B, "Zyyy" },
{ 0x0AB70, 0x0ABBF, "Cher" },
{ 0x0ABC0, 0x0ABED, "Mtei" },
{ 0x0ABF0, 0x0ABF9, "Mtei" },
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```
{ 0x0AC00, 0x0D7A3, "Hang" },
{ 0x0D7B0, 0x0D7C6, "Hang" },
{ 0x0D7CB, 0x0D7FB, "Hang" },
{ 0x0F900, 0x0FA6D, "Hani" },
{ 0x0FA70, 0x0FAD9, "Hani" },
{ 0x0FB00, 0x0FB06, "Latn" },
{ 0x0FB13, 0x0FB17, "Armn" },
{ 0x0FB1D, 0x0FB36, "Hebr" },
{ 0x0FB38, 0x0FB3C, "Hebr" },
{ 0x0FB40, 0x0FB41, "Hebr" },
{ 0x0FB43, 0x0FB44, "Hebr" },
{ 0x0FB46, 0x0FB4F, "Hebr" },
{ 0x0FB50, 0x0FBC2, "Arab" },
{ 0x0FBD3, 0x0FD3D, "Arab" },
{ 0x0FD3E, 0x0FD3F, "Zyyy" },
{ 0x0FD40, 0x0FD8F, "Arab" },
{ 0x0FD92, 0x0FDC7, "Arab" },
{ 0x0FDF0, 0x0FDFF, "Arab" },
{ 0x0FE00, 0x0FE0F, "Zinh" },
{ 0x0FE10, 0x0FE19, "Zyyy" },
{ 0x0FE20, 0x0FE2D, "Zinh" },
{ 0x0FE2E, 0x0FE2F, "Cyr1" },
{ 0x0FE30, 0x0FE52, "Zyyy" },
{ 0x0FE54, 0x0FE66, "Zyyy" },
{ 0x0FE68, 0x0FE6B, "Zyyy" },
{ 0x0FE70, 0x0FE74, "Arab" },
{ 0x0FE76, 0x0FEFC, "Arab" },
{ 0x0FF01, 0x0FF20, "Zyyy" },
{ 0x0FF21, 0x0FF3A, "Latn" },
{ 0x0FF3B, 0x0FF40, "Zyyy" },
{ 0x0FF41, 0x0FF5A, "Latn" },
{ 0x0FF5B, 0x0FF65, "Zyyy" },
{ 0x0FF66, 0x0FF6F, "Kana" },
{ 0x0FF71, 0x0FF9D, "Kana" },
{ 0x0FF9E, 0x0FF9F, "Zyyy" },
{ 0x0FFA0, 0x0FFBE, "Hang" },
{ 0x0FFC2, 0x0FFC7, "Hang" },
{ 0x0FFCA, 0x0FFCF, "Hang" },
{ 0x0FFD2, 0x0FFD7, "Hang" },
{ 0x0FFDA, 0x0FFDC, "Hang" },
{ 0x0FFE0, 0x0FFE6, "Zyyy" },
{ 0x0FFE8, 0x0FEE, "Zyyy" },
{ 0x0FFF9, 0x0FFFD, "Zyyy" },
{ 0x10000, 0x1000B, "Linb" },
{ 0x1000D, 0x10026, "Linb" },
{ 0x10028, 0x1003A, "Linb" },
{ 0x1003C, 0x1003D, "Linb" },
{ 0x1003F, 0x1004D, "Linb" },
{ 0x10050, 0x1005D, "Linb" },
{ 0x10080, 0x100FA, "Linb" },
{ 0x10100, 0x10102, "Zyyy" },
{ 0x10107, 0x10133, "Zyyy" },
{ 0x10137, 0x1013F, "Zyyy" },
{ 0x10140, 0x1018E, "Grek" },
{ 0x10190, 0x1019C, "Zyyy" },
{ 0x101D0, 0x101FC, "Zyyy" },
{ 0x10280, 0x1029C, "Lyci" },
{ 0x102A0, 0x102D0, "Cari" },
{ 0x102E1, 0x102FB, "Zyyy" },
{ 0x10300, 0x10323, "Ital" },
{ 0x1032D, 0x1032F, "Ital" },
{ 0x10330, 0x1034A, "Goth" },
{ 0x10350, 0x1037A, "Perm" },
{ 0x10380, 0x1039D, "Ugar" },
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{ 0x103C8, 0x103D5, "Xpeo" },
{ 0x10400, 0x1044F, "Dsrt" },
{ 0x10450, 0x1047F, "Shaw" },
{ 0x10480, 0x1049D, "Osma" },
{ 0x104A0, 0x104A9, "Osma" },
{ 0x104B0, 0x104D3, "Osge" },
{ 0x104D8, 0x104FB, "Osge" },
{ 0x10500, 0x10527, "Elba" },
{ 0x10530, 0x10563, "Aghb" },
{ 0x10570, 0x1057A, "Vith" },
{ 0x1057C, 0x1058A, "Vith" },
{ 0x1058C, 0x10592, "Vith" },
{ 0x10594, 0x10595, "Vith" },
{ 0x10597, 0x105A1, "Vith" },
{ 0x105A3, 0x105B1, "Vith" },
{ 0x105B3, 0x105B9, "Vith" },
{ 0x105BB, 0x105BC, "Vith" },
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{ 0x10740, 0x10755, "Lina" },
{ 0x10760, 0x10767, "Lina" },
{ 0x10780, 0x10785, "Latn" },
{ 0x10787, 0x107B0, "Latn" },
{ 0x107B2, 0x107BA, "Latn" },
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{ 0x1080A, 0x10835, "Cprt" },
{ 0x10837, 0x10838, "Cprt" },
{ 0x10840, 0x10855, "Armi" },
{ 0x10857, 0x1085F, "Armi" },
{ 0x10860, 0x1087F, "Palm" },
{ 0x10880, 0x1089E, "Nbat" },
{ 0x108A7, 0x108AF, "Nbat" },
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{ 0x108F4, 0x108F5, "Hatr" },
{ 0x108FB, 0x108FF, "Hatr" },
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{ 0x10920, 0x10939, "Lydi" },
{ 0x10980, 0x1099F, "Mero" },
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{ 0x109D2, 0x109FF, "Merc" },
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{ 0x10A38, 0x10A3A, "Khar" },
{ 0x10A3F, 0x10A48, "Khar" },
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{ 0x10A80, 0x10A9F, "Narb" },
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{ 0x10AEB, 0x10AF6, "Mani" },
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{ 0x10B39, 0x10B3F, "Avst" },
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{ 0x10B58, 0x10B5F, "Prti" },
{ 0x10B60, 0x10B72, "Phli" },
{ 0x10B78, 0x10B7F, "Phli" },
{ 0x10B80, 0x10B91, "Phlp" },
{ 0x10B99, 0x10B9C, "Phlp" },
{ 0x10BA9, 0x10BAF, "Phlp" },
{ 0x10C00, 0x10C48, "Orkh" },
{ 0x10C80, 0x10CB2, "Hung" },
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{ 0x10CFA, 0x10CFF, "Hung" },
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{ 0x10EAB, 0x10EAD, "Yezi" },
{ 0x10EB0, 0x10EB1, "Yezi" },
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{ 0x10F30, 0x10F59, "Sogd" },
{ 0x10F70, 0x10F89, "Ougr" },
{ 0x10FB0, 0x10FCB, "Chrs" },
{ 0x10FE0, 0x10FF6, "Elym" },
{ 0x11000, 0x1104D, "Brah" },
{ 0x11052, 0x11075, "Brah" },
{ 0x11080, 0x110C2, "Kthi" },
{ 0x110D0, 0x110E8, "Sora" },
{ 0x110F0, 0x110F9, "Sora" },
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{ 0x11136, 0x11147, "Cakm" },
{ 0x11150, 0x11176, "Mahj" },
{ 0x11180, 0x111DF, "Shrd" },
{ 0x111E1, 0x111F4, "Sinh" },
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{ 0x11213, 0x1123E, "Khoj" },
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{ 0x1128F, 0x1129D, "Mult" },
{ 0x1129F, 0x112A9, "Mult" },
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{ 0x112F0, 0x112F9, "Sind" },
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{ 0x11332, 0x11333, "Gran" },
{ 0x11335, 0x11339, "Gran" },
{ 0x1133C, 0x11344, "Gran" },
{ 0x11347, 0x11348, "Gran" },
{ 0x1134B, 0x1134D, "Gran" },
{ 0x1135D, 0x11363, "Gran" },
{ 0x11366, 0x1136C, "Gran" },
{ 0x11370, 0x11374, "Gran" },
{ 0x11400, 0x1145B, "Newa" },
{ 0x1145D, 0x11461, "Newa" },
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{ 0x114D0, 0x114D9, "Tirh" },
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{ 0x115B8, 0x115DD, "Sidd" },
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{ 0x11650, 0x11659, "Modi" },
{ 0x11660, 0x1166C, "Mong" },
{ 0x11680, 0x116B9, "Takr" },
{ 0x116C0, 0x116C9, "Takr" },
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{ 0x1171D, 0x1172B, "Ahom" },
{ 0x11730, 0x11746, "Ahom" },
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{ 0x119AA, 0x119D7, "Nand" },
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{ 0x11AB0, 0x11ABF, "Cans" },
{ 0x11AC0, 0x11AF8, "Pauc" },
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{ 0x11C0A, 0x11C36, "Bhks" },
{ 0x11C38, 0x11C45, "Bhks" },
{ 0x11C50, 0x11C6C, "Bhks" },
{ 0x11C70, 0x11C8F, "Marc" },
{ 0x11C92, 0x11CA7, "Marc" },
{ 0x11CA9, 0x11CB6, "Marc" },
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{ 0x11D08, 0x11D09, "Gonm" },
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{ 0x11D3C, 0x11D3D, "Gonm" },
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{ 0x11D93, 0x11D98, "Gong" },
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{ 0x12470, 0x12474, "Xsux" },
{ 0x12480, 0x12543, "Xsux" },
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{ 0x14400, 0x14646, "Hluw" },
{ 0x16800, 0x16A38, "Bamu" },
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{ 0x16A60, 0x16A69, "Mroo" },
{ 0x16A6E, 0x16A6F, "Mroo" },
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{ 0x16AF0, 0x16AF5, "Bass" },
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{ 0x16B5B, 0x16B61, "Hmng" },
{ 0x16B63, 0x16B77, "Hmng" },
{ 0x16B7D, 0x16B8F, "Hmng" },
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{ 0x16F00, 0x16F4A, "Plrd" },
{ 0x16F4F, 0x16F87, "Plrd" },
{ 0x16F8F, 0x16F9F, "Plrd" },
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{ 0x16FF0, 0x16FF1, "Hani" },
{ 0x17000, 0x187F7, "Tang" },
{ 0x18800, 0x18AFF, "Tang" },
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{ 0x18D00, 0x18D08, "Tang" },
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{ 0x1B164, 0x1B167, "Kana" },
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{ 0x1BC70, 0x1BC7C, "Dupl" },
{ 0x1BC80, 0x1BC88, "Dupl" },
{ 0x1BC90, 0x1BC99, "Dupl" },
{ 0x1BC9C, 0x1BC9F, "Dupl" },
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{ 0x1CF00, 0x1CF2D, "Zinh" },
{ 0x1CF30, 0x1CF46, "Zinh" },
{ 0x1CF50, 0x1CFC3, "Zyyy" },
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{ 0x1D183, 0x1D184, "Zyyy" },
{ 0x1D185, 0x1D18B, "Zinh" },
{ 0x1D18C, 0x1D1A9, "Zyyy" },
{ 0x1D1AA, 0x1D1AD, "Zinh" },
{ 0x1D1AE, 0x1D1EA, "Zyyy" },
{ 0x1D200, 0x1D245, "Grek" },
{ 0x1D2E0, 0x1D2F3, "Zyyy" },
{ 0x1D300, 0x1D356, "Zyyy" },
{ 0x1D360, 0x1D378, "Zyyy" },
{ 0x1D400, 0x1D454, "Zyyy" },
{ 0x1D456, 0x1D49C, "Zyyy" },
{ 0x1D49E, 0x1D49F, "Zyyy" },
{ 0x1D4A5, 0x1D4A6, "Zyyy" },
{ 0x1D4A9, 0x1D4AC, "Zyyy" },
{ 0x1D4AE, 0x1D4B9, "Zyyy" },
{ 0x1D4BD, 0x1D4C3, "Zyyy" },
{ 0x1D4C5, 0x1D505, "Zyyy" },
{ 0x1D507, 0x1D50A, "Zyyy" },
{ 0x1D50D, 0x1D514, "Zyyy" },
{ 0x1D516, 0x1D51C, "Zyyy" },
{ 0x1D51E, 0x1D539, "Zyyy" },
{ 0x1D53B, 0x1D53E, "Zyyy" },
{ 0x1D540, 0x1D544, "Zyyy" },
{ 0x1D54A, 0x1D550, "Zyyy" },
{ 0x1D552, 0x1D6A5, "Zyyy" },
{ 0x1D6A8, 0x1D7CB, "Zyyy" },
{ 0x1D7CE, 0x1D7FF, "Zyyy" },
{ 0x1D800, 0x1DA8B, "Sgnw" },
{ 0x1DA9B, 0x1DA9F, "Sgnw" },
{ 0x1DAA1, 0x1DAAF, "Sgnw" },
{ 0x1DF00, 0x1DF1E, "Latn" },
{ 0x1E000, 0x1E006, "Glag" },
{ 0x1E008, 0x1E018, "Glag" },
{ 0x1E01B, 0x1E021, "Glag" },
{ 0x1E023, 0x1E024, "Glag" },
{ 0x1E026, 0x1E02A, "Glag" },
{ 0x1E100, 0x1E12C, "Hmnp" },
{ 0x1E130, 0x1E13D, "Hmnp" },
{ 0x1E140, 0x1E149, "Hmnp" },
{ 0x1E14E, 0x1E14F, "Hmnp" },
{ 0x1E290, 0x1E2AE, "Toto" },
{ 0x1E2C0, 0x1E2F9, "Wcho" },
{ 0x1E7E0, 0x1E7E6, "Ethi" },
```



```
{ 0x1E7E8, 0x1E7EB, "Ethi" },
{ 0x1E7ED, 0x1E7EE, "Ethi" },
{ 0x1E7F0, 0x1E7FE, "Ethi" },
{ 0x1E800, 0x1E8C4, "Mend" },
{ 0x1E8C7, 0x1E8D6, "Mend" },
{ 0x1E900, 0x1E94B, "Adlm" },
{ 0x1E950, 0x1E959, "Adlm" },
{ 0x1E95E, 0x1E95F, "Adlm" },
{ 0x1EC71, 0x1ECB4, "Zyyy" },
{ 0x1ED01, 0x1ED3D, "Zyyy" },
{ 0x1EE00, 0x1EE03, "Arab" },
{ 0x1EE05, 0x1EE1F, "Arab" },
{ 0x1EE21, 0x1EE22, "Arab" },
{ 0x1EE29, 0x1EE32, "Arab" },
{ 0x1EE34, 0x1EE37, "Arab" },
{ 0x1EE4D, 0x1EE4F, "Arab" },
{ 0x1EE51, 0x1EE52, "Arab" },
{ 0x1EE61, 0x1EE62, "Arab" },
{ 0x1EE67, 0x1EE6A, "Arab" },
{ 0x1EE6C, 0x1EE72, "Arab" },
{ 0x1EE74, 0x1EE77, "Arab" },
{ 0x1EE79, 0x1EE7C, "Arab" },
{ 0x1EE80, 0x1EE89, "Arab" },
{ 0x1EE8B, 0x1EE9B, "Arab" },
{ 0x1EEA1, 0x1EEA3, "Arab" },
{ 0x1EEA5, 0x1EEA9, "Arab" },
{ 0x1EEAB, 0x1EEBB, "Arab" },
{ 0x1EEF0, 0x1EEF1, "Arab" },
{ 0x1F000, 0x1F02B, "Zyyy" },
{ 0x1F030, 0x1F093, "Zyyy" },
{ 0x1F0A0, 0x1F0AE, "Zyyy" },
{ 0x1F0B1, 0x1F0BF, "Zyyy" },
{ 0x1F0C1, 0x1F0CF, "Zyyy" },
{ 0x1F0D1, 0x1F0F5, "Zyyy" },
{ 0x1F100, 0x1F1AD, "Zyyy" },
{ 0x1F1E6, 0x1F1FF, "Zyyy" },
{ 0x1F201, 0x1F202, "Zyyy" },
{ 0x1F210, 0x1F23B, "Zyyy" },
{ 0x1F240, 0x1F248, "Zyyy" },
{ 0x1F250, 0x1F251, "Zyyy" },
{ 0x1F260, 0x1F265, "Zyyy" },
{ 0x1F300, 0x1F6D7, "Zyyy" },
{ 0x1F6DD, 0x1F6EC, "Zyyy" },
{ 0x1F6F0, 0x1F6FC, "Zyyy" },
{ 0x1F700, 0x1F773, "Zyyy" },
{ 0x1F780, 0x1F7D8, "Zyyy" },
{ 0x1F7E0, 0x1F7EB, "Zyyy" },
{ 0x1F800, 0x1F80B, "Zyyy" },
{ 0x1F810, 0x1F847, "Zyyy" },
{ 0x1F850, 0x1F859, "Zyyy" },
{ 0x1F860, 0x1F887, "Zyyy" },
{ 0x1F890, 0x1F8AD, "Zyyy" },
{ 0x1F8B0, 0x1F8B1, "Zyyy" },
{ 0x1F900, 0x1FA53, "Zyyy" },
{ 0x1FA60, 0x1FA6D, "Zyyy" },
{ 0x1FA70, 0x1FA74, "Zyyy" },
{ 0x1FA78, 0x1FA7C, "Zyyy" },
{ 0x1FA80, 0x1FA86, "Zyyy" },
{ 0x1FA90, 0x1FAAC, "Zyyy" },
{ 0x1FAB0, 0x1FABA, "Zyyy" },
{ 0x1FAC0, 0x1FAC5, "Zyyy" },
{ 0x1FAD0, 0x1FAD9, "Zyyy" },
{ 0x1FAE0, 0x1FAE7, "Zyyy" },
{ 0x1FAF0, 0x1FAF6, "Zyyy" },
```

```
{ 0x1FB00, 0x1FB92, "Zyyy" },
{ 0x1FB94, 0x1FBCA, "Zyyy" },
{ 0x1FBF0, 0x1FBF9, "Zyyy" },
{ 0x20000, 0x2A6DF, "Hani" },
{ 0x2A700, 0x2B738, "Hani" },
{ 0x2B740, 0x2B81D, "Hani" },
{ 0x2B820, 0x2CEA1, "Hani" },
{ 0x2CEB0, 0x2EBE0, "Hani" },
{ 0x2F800, 0x2FA1D, "Hani" },
{ 0x30000, 0x3134A, "Hani" },
{ 0xE0020, 0xE007F, "Zyyy" },
{ 0xE0100, 0xE01EF, "Zinh" },
},
-- Scripts.txt gives full names; here we consider them aliases to save space
aliases = {
  Adlm = "Adlam",
  Aghb = "Caucasian Albanian",
  Ahom = "Ahom",
  Arab = "Arabic",
  Armi = "Imperial Aramaic",
  Armn = "Armenian",
  Avst = "Avestan",
  Bali = "Balinese",
  Bamu = "Bamum",
  Bass = "Bassa Vah",
  Batk = "Batak",
  Beng = "Bengali",
  Bhks = "Bhaiksuki",
  Bopo = "Bopomofo",
  Brah = "Brahmi",
  Brai = "Braille",
  Bugi = "Buginese",
  Buhd = "Buhid",
  Cakm = "Chakma",
  Cans = "Canadian Aboriginal",
  Cari = "Carian",
  Cham = "Cham",
  Cher = "Cherokee",
  Chrs = "Chorasmian",
  Copt = "Coptic",
  Cpmn = "Cypro Minoan",
  Cpvt = "Cypriot",
  Cyrl = "Cyrillic",
  Deva = "Devanagari",
  Diak = "Dives Akuru",
  Dogr = "Dogra",
  Dsrt = "Deseret",
  Dupl = "Duployan",
  Egyp = "Egyptian Hieroglyphs",
  Elba = "Elbasan",
  Elym = "Elymaic",
  Ethi = "Ethiopic",
  Geor = "Georgian",
  Glag = "Glagolitic",
  Gong = "Gunjala Gondi",
  Gonm = "Masaram Gondi",
  Goth = "Gothic",
  Gran = "Grantha",
  Grek = "Greek",
  Gujr = "Gujarati",
  Guru = "Gurmukhi",
  Hang = "Hangul",
  Hani = "Han",
  Hano = "Hanunoo",
```



```
Hatr = "Hatran",
Hebr = "Hebrew",
Hira = "Hiragana",
Hluw = "Anatolian Hieroglyphs",
Hmng = "Pahawh Hmong",
Hmnp = "Nyiakeng Puachue Hmong",
Hrkt = "Katakana Or Hiragana",
Hung = "Old Hungarian",
Ital = "Old Italic",
Java = "Javanese",
Kali = "Kayah Li",
Kana = "Katakana",
Khar = "Kharoshthi",
Khmr = "Khmer",
Khoj = "Khojki",
Kits = "Khitan Small Script",
Knda = "Kannada",
Kthi = "Kaithi",
Lana = "Tai Tham",
Laoo = "Lao",
Latn = "Latin",
Lepc = "Lepcha",
Limb = "Limbu",
Lina = "Linear A",
Linb = "Linear B",
Lisu = "Lisu",
Lyci = "Lycian",
Lydi = "Lydian",
Mahj = "Mahajani",
Maka = "Makasar",
Mand = "Mandaic",
Mani = "Manichaean",
Marc = "Marchen",
Medf = "Medefaidrin",
Mend = "Mende Kikakui",
Merc = "Meroitic Cursive",
Mero = "Meroitic Hieroglyphs",
Mlym = "Malayalam",
Modi = "Modi",
Mong = "Mongolian",
Mroo = "Mro",
Mtei = "Meetei Mayek",
Mult = "Multani",
Mymr = "Myanmar",
Nand = "Nandinagari",
Narb = "Old North Arabian",
Nbat = "Nabataean",
Newa = "Newa",
Nkoo = "Nko",
Nshu = "Nushu",
Ogam = "Ogham",
Olck = "Ol Chiki",
Orkh = "Old Turkic",
Orya = "Oriya",
Osge = "Osage",
Osma = "Osmanya",
Ougr = "Old Uyghur",
Palm = "Palmyrene",
Pauc = "Pau Cin Hau",
Perm = "Old Permic",
Phag = "Phags Pa",
Phli = "Inscriptional Pahlavi",
Phlp = "Psalter Pahlavi",
Phnx = "Phoenician",
```

```
    Plrd = "Miao",
    Prti = "Inscriptional Parthian",
    Rjng = "Rejang",
    Rohg = "Hanifi Rohingya",
    Runr = "Runic",
    Samr = "Samaritan",
    Sarb = "Old South Arabian",
    Saur = "Saurashtra",
    Sgnw = "SignWriting",
    Shaw = "Shavian",
    Shrd = "Sharada",
    Sidd = "Siddham",
    Sind = "Khudawadi",
    Sinh = "Sinhala",
    Sogd = "Sogdian",
    Sogo = "Old Sogdian",
    Sora = "Sora Sompeng",
    Soyo = "Soyombo",
    Sund = "Sundanese",
    Sylo = "Syloti Nagri",
    Syrc = "Syriac",
    Tagb = "Tagbanwa",
    Takr = "Takri",
    Tale = "Tai Le",
    Talu = "New Tai Lue",
    Taml = "Tamil",
    Tang = "Tangut",
    Tavn = "Tai Viet",
    Telu = "Telugu",
    Tfng = "Tifinagh",
    Tglg = "Tagalog",
    Thaa = "Thaana",
    Thai = "Thai",
    Tibt = "Tibetan",
    Tirh = "Tirhuta",
    Tnsa = "Tangsa",
    Toto = "Toto",
    Ugar = "Ugaritic",
    Vaih = "Vai",
    Vith = "Vithkuqi",
    Wara = "Warang Citi",
    Wcho = "Wancho",
    Xpeo = "Old Persian",
    Xsux = "Cuneiform",
    Yezi = "Yezidi",
    Yiii = "Yi",
    Zanb = "Zanabazar Square",
    Zinh = "Inherited",
    Zyyy = "Common",
    Zzzz = "Unknown",
  },
}

-- Required for binary search function in [[Module:Language/scripts]].
-- Cannot get length of module loaded with mw.loadData.
data.ranges.length = #data.ranges

data.rtl = {}

for _, script in ipairs(mw.loadData "Module:Lang/data".rtl_scripts) do
```



```
-- [[Module:Lang/data]] has script codes in lowercase;  
-- this module has script codes with the first letter capitalized.  
data.rtl[script:gsub("^%a", string.upper)] = true  
end  
return data
```

Modul:Unicode data

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Usage

This module provides functions that access information on Unicode code points. The information is retrieved from data modules generated from the [Unicode Character Database](#), or derived by rules given in the [Unicode Specification](#). It and its submodules were copied from English Wiktionary and then modified; see [there](#) for more information.

Functions

Vorlage:Code

Receives a code point (number) and returns its name or label; for example, [Vorlage:Code](#) returns [Vorlage:Code](#).

For example, [Vorlage:Tnull](#) → `<reserved-0061>`

Vorlage:Code

Template-invokable functions that allow access to the functions starting with `lookup` and `is`. Replace the first underscore in the function name with a pipe. For most of the functions, add the code point in hexadecimal base as the next parameter, but for `is_Latin`, `is_rtl`, and `is_valid_pagename`, add text. [HTML character references](#) in the text are decoded by the module into code points.

For example, [Vorlage:Tnull](#) → **Lua-Fehler in Zeile 293: attempt to index local 'data_module' (a boolean value).**

Data modules

The data used by functions in this module is found in [submodules](#). Some are generated by [AWK](#) scripts shown at [User:Kephir/Unicode](#) on English Wiktionary, others by Lua scripts on the `/make` subpages of the submodules.

- [Module:Unicode data/aliases](#): the formal name aliases for characters (from [NameAliases.txt](#))
- [Module:Unicode data/blocks](#): the list of Unicode blocks (from [Blocks.txt](#))
- [Module:Unicode data/category](#): data mapping characters to their General Category (from [DerivedGeneralCategory.txt](#))
- [Module:Unicode data/control](#): data for identifying characters that belong to the General Categories of Separator and Other (from [DerivedGeneralCategory.txt](#))



- [Module:Unicode data/combining](#): data mapping characters to their Combining Classes (from [DerivedCombiningClass.txt](#))
- [Module:Unicode data/Hangul](#): data used to generate the names of [Hangul](#) syllables (from [Jamo.txt](#))
- [Module:Unicode data/scripts](#): data mapping characters to their Unicode script properties (from [Scripts.txt](#)).

The name data modules ([Module:Unicode data/names/xxx](#)) were compiled from [UnicodeData.txt](#). Each one contains, at maximum, code points U+xxx000 to U+xxxFFF. **Lua-Fehler in mw.title.lua, Zeile 206: too many expensive function calls**

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```
local p = {}  
  
local floor = math.floor  
  
local function errorf(level, ...)  
    if type(level) == "number" then  
        return error(string.format(...), level + 1)
```



```
        else -- level is actually the format string.
            return error(string.format(level, ...), 2)
        end
    end
end

local function binary_range_search(codepoint, ranges)
    local low, mid, high
    low, high = 1, ranges.length or require "Module:TableTools".length(ranges)
    while low <= high do
        mid = floor((low + high) / 2)
        local range = ranges[mid]
        if codepoint < range[1] then
            high = mid - 1
        elseif codepoint <= range[2] then
            return range, mid
        else
            low = mid + 1
        end
    end
    end
    return nil, mid
end
p.binary_range_search = binary_range_search

--[[
local function linear_range_search(codepoint, ranges)
    for i, range in ipairs(ranges) do
        if range[1] <= codepoint and codepoint <= range[2] then
            return range
        end
    end
end
end
--]]

-- Load a module by indexing "loader" with the name of the module minus the
-- "Module:Unicode data/" part. For instance, loader.blocks returns
-- [[Module:Unicode data/blocks]]. If a module cannot be loaded, false will be
-- returned.
local loader = setmetatable({}, {
    __index = function (self, key)
        local success, data = pcall(mw.loadData, "Module:Unicode data/" .. key)
        if not success then
            data = false
        end
        self[key] = data
        return data
    end
})

-- For the algorithm used to generate Hangul Syllable names,
-- see "Hangul Syllable Name Generation" in section 3.12 of the
-- Unicode Specification:
-- https://www.unicode.org/versions/Unicode11.0.0/ch03.pdf
local name_hooks = {
    { 0x00, 0x1F, "<control-%04X>" }, -- C0 control characters
    { 0x7F, 0x9F, "<control-%04X>" }, -- DEL and C1 control characters
    { 0x3400, 0x4DBF, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Extension A
    { 0x4E00, 0x9FFF, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Extension B
    { 0xAC00, 0xD7A3, function (codepoint) -- Hangul Syllables
        local Hangul_data = loader.Hangul
        local syllable_index = codepoint - 0xAC00

        return ("HANGUL SYLLABLE %s%s%s"):format(
            Hangul_data.leads[floor(syllable_index / Hangul_data.final_syllable_count), 1],
            Hangul_data.vowels[floor((syllable_index % Hangul_data.final_syllable_count) / Hangul_data.vowel_count), 1],
            Hangul_data.consonants[floor(syllable_index % Hangul_data.vowel_count), 1]
        )
    end
}

```

```
        / Hangul_data.trail_count)],
        Hangul_data.trails[syllable_index % Hangul_data.trail_co
    end },
    -- High Surrogates, High Private Use Surrogates, Low Surrogates
    { 0xD800, 0xDFFF, "<surrogate-%04X>" },
    { 0xE000, 0xF8FF, "<private-use-%04X>" }, -- Private Use
    -- CJK Compatibility Ideographs
    { 0xF900, 0xFA6D, "CJK COMPATIBILITY IDEOGRAPH-%04X" },
    { 0xFA70, 0xFAD9, "CJK COMPATIBILITY IDEOGRAPH-%04X" },
    { 0x17000, 0x187F7, "TANGUT IDEOGRAPH-%04X" }, -- Tangut Ideograph
    { 0x18800, 0x18AFF, function (codepoint)
        return ("TANGUT COMPONENT-%03d"):format(codepoint - 0x187FF)
    end },
    { 0x18D00, 0x18D08, "TANGUT IDEOGRAPH-%04X" }, -- Tangut Ideograph Supp
    { 0x1B170, 0x1B2FB, "NUSHU CHARACTER-%04X" }, -- Nushu
    { 0x20000, 0x2A6DF, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Ex
    { 0x2A700, 0x2B738, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Ex
    { 0x2B740, 0x2B81D, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Ex
    { 0x2B820, 0x2CEA1, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Ex
    { 0x2CEB0, 0x2EBE0, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Ex
    -- CJK Compatibility Ideographs Supplement (Supplementary Ideographic Pla
    { 0x2F800, 0x2FA1D, "CJK COMPATIBILITY IDEOGRAPH-%04X" },
    { 0xE0100, 0xE01EF, function (codepoint) -- Variation Selectors Supplem
        return ("VARIATION SELECTOR-%d"):format(codepoint - 0xE0100 + 17)
    end},
    { 0x30000, 0x3134A, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Ex
    { 0xF0000, 0xFFFFD, "<private-use-%04X>" }, -- Plane 15 Private Use
    { 0x100000, 0x10FFFFD, "<private-use-%04X>" } -- Plane 16 Private Use
}
name_hooks.length = #name_hooks

local name_range_cache

local function generate_name(data, codepoint)
    if type(data) == "string" then
        return data:format(codepoint)
    else
        return data(codepoint)
    end
end

end

--[
-- Checks that the code point is a number and in range.
-- Does not check whether code point is an integer.
-- Not used
local function check_codepoint(funcName, argIdx, val)
    require 'libraryUtil'.checkType(funcName, argIdx, val, 'number')
    if codepoint < 0 or 0x10FFFF < codepoint then
        errorf("Codepoint %04X out of range", codepoint)
    end
end

end
--]]

-- https://www.unicode.org/versions/Unicode11.0.0/ch04.pdf, section 4.8
function p.lookup_name(codepoint)
    -- U+FDD0-U+FDEF and all code points ending in FFFE or FFFF are Unassigne
    -- (Cn) and specifically noncharacters:
    -- https://www.unicode.org/faq/private_use.html#nonchar4
    if 0xFDD0 <= codepoint and (codepoint <= 0xFDEF
        or floor(codepoint % 0x10000) >= 0xFFFFE) then
        return ("<noncharacter-%04X>"):format(codepoint)
    end
end
```



```
    if name_range_cache -- Check if previously used "name hook" applies to the
        and codepoint >= name_range_cache[1]
        and codepoint <= name_range_cache[2] then
        return generate_name(name_range_cache[3], codepoint)
    end

    local range = binary_range_search(codepoint, name_hooks)
    if range then
        name_range_cache = range
        return generate_name(range[3], codepoint)
    end

    local data = loader[('names/%03X'):format(codepoint / 0x1000)]

    if data and data[codepoint] then
        return data[codepoint]

        -- Unassigned (Cn) consists of noncharacters and reserved characters.
        -- The character has been established not to be a noncharacter,
        -- and if it were assigned, its name would already have been retrieved,
        -- so it must be reserved.
    else
        return ("<reserved-%04X>"):format(codepoint)
    end
end

--[[
-- No image data modules on Wikipedia yet.
function p.lookup_image(codepoint)
    local data = loader[('images/%03X'):format(codepoint / 0x1000)]

    if data then
        return data[codepoint]
    end
end
--]]

local planes = {
    [ 0] = "Basic Multilingual Plane";
    [ 1] = "Supplementary Multilingual Plane";
    [ 2] = "Supplementary Ideographic Plane";
    [ 3] = "Tertiary Ideographic Plane";
    [14] = "Supplementary Special-purpose Plane";
    [15] = "Supplementary Private Use Area-A";
    [16] = "Supplementary Private Use Area-B";
}

-- Load [[Module:Unicode data/blocks]] if needed and assign it to this variable.
local blocks

local function block_iter(blocks, i)
    i = i + 1
    local data = blocks[i]
    if data then
        -- Unpack doesn't work on tables loaded with mw.loadData.
        return i, data[1], data[2], data[3]
    end
end

-- An ipairs-type iterator generator for the list of blocks.
function p.enum_blocks()
    local blocks = loader.blocks
    return block_iter, blocks, 0
end
```

```
function p.lookup_plane(codepoint)
    local i = floor(codepoint / 0x10000)
    return planes[i] or ("Plane %u"):format(i)
end

function p.lookup_block(codepoint)
    local blocks = loader.blocks
    local range = binary_range_search(codepoint, blocks)
    if range then
        return range[3]
    else
        return "No Block"
    end
end

function p.get_block_info(name)
    for i, block in ipairs(loader.blocks) do
        if block[3] == name then
            return block
        end
    end
end

function p.is_valid_pagename(pagename)
    local has_nonws = false

    for cp in mw.ustring.gcodepoint(pagename) do
        if (cp == 0x0023) -- #
        or (cp == 0x005B) -- [
        or (cp == 0x005D) -- ]
        or (cp == 0x007B) -- {
        or (cp == 0x007C) -- |
        or (cp == 0x007D) -- }
        or (cp == 0x180E) -- MONGOLIAN VOWEL SEPARATOR
        or ((cp >= 0x2000) and (cp <= 0x200A)) -- spaces in General Punct
        or (cp == 0xFFFF) -- REPLACEMENT CHARACTER
        then
            return false
        end

        local printable, result = p.is_printable(cp)
        if not printable then
            return false
        end

        if result ~= "space-separator" then
            has_nonws = true
        end
    end

    return has_nonws
end

local function manual_unpack(what, from)
    if what[from + 1] == nil then
        return what[from]
    end

    local result = {}
    from = from or 1
    for i, item in ipairs(what) do
        if i >= from then
            table.insert(result, item)
        end
    end
end
```

```
        end
    end
    return unpack(result)
end

local function compare_ranges(range1, range2)
    return range1[1] < range2[1]
end

-- Creates a function to look up data in a module that contains "singles" (a
-- code point-to-data map) and "ranges" (an array containing arrays that contain
-- the low and high code points of a range and the data associated with that
-- range).
-- "loader" loads and returns the "singles" and "ranges" tables.
-- "match_func" is passed the code point and either the data or the "dots", and
-- generates the final result of the function.
-- The varargs ("dots") describes the default data to be returned if there wasn't
-- a match.
-- In case the function is used more than once, "cache" saves ranges that have
-- already been found to match, or a range whose data is the default if there
-- was no match.
local function memo_lookup(data_module_subpage, match_func, ...)
    local dots = { ... }
    local cache = {}
    local singles, ranges

    return function (codepoint)
        if not singles then
            local data_module = loader[data_module_subpage]
            singles, ranges = data_module.singles, data_module.ranges
        end

        if singles[codepoint] then
            return match_func(codepoint, singles[codepoint])
        end

        local range = binary_range_search(codepoint, cache)
        if range then
            return match_func(codepoint, manual_unpack(range, 3))
        end

        local range, index = binary_range_search(codepoint, ranges)
        if range then
            table.insert(cache, range)
            table.sort(cache, compare_ranges)
            return match_func(codepoint, manual_unpack(range, 3))
        end

        if ranges[index] then
            local dots_range
            if codepoint > ranges[index][2] then
                dots_range = {
                    ranges[index][2] + 1,
                    ranges[index + 1] and ranges[index + 1][1]
                }
            else -- codepoint < range[index][1]
                dots_range = {
                    ranges[index - 1] and ranges[index - 1][2],
                    ranges[index][1] - 1,
                    unpack(dots)
                }
            end
            end
            table.sort(cache, compare_ranges)
        end
    end
end
```

```
        end
        return match_func(codepoint)
    end
end

-- Get a code point's combining class value in [[Module:Unicode data/combining]]
-- and return whether this value is not zero. Zero is assigned as the default
-- if the combining class value is not found in this data module.
-- That is, return true if character is combining, or false if it is not.
-- See https://www.unicode.org/reports/tr44/#Canonical\_Combining\_Class\_Values for
-- more information.
p.is_combining = memo_lookup(
    "combining",
    function (codepoint, combining_class)
        return combining_class and combining_class ~= 0 or false
    end,
    0)

function p.add_dotted_circle(str)
    return (mw.uststring.gsub(str, ".",
        function(char)
            if p.is_combining(mw.uststring.codepoint(char)) then
                return '◌' .. char
            end
        end))
end

end

local lookup_control = memo_lookup(
    "control",
    function (codepoint, ccc)
        return ccc or "assigned"
    end,
    "assigned")
p.lookup_control = lookup_control

function p.is_assigned(codepoint)
    return lookup_control(codepoint) ~= "unassigned"
end

function p.is_printable(codepoint)
    local result = lookup_control(codepoint)
    return (result == "assigned") or (result == "space-separator"), result
end

function p.is_whitespace(codepoint)
    local result = lookup_control(codepoint)
    return (result == "space-separator"), result
end

p.lookup_category = memo_lookup(
    "category",
    function (codepoint, category)
        return category
    end,
    "Cn")

local lookup_script = memo_lookup(
    "scripts",
    function (codepoint, script_code)
        return script_code or 'Zzzz'
    end,
    "Zzzz")
p.lookup_script = lookup_script
```

```
function p.get_best_script(str)
  -- Check type of argument, because mw.text.decode coerces numbers to strings
  require "libraryUtil".checkType("get_best_script", 1, str, "string")

  -- Convert HTML character references (including named character references
  -- or character entities) to characters.
  str = mw.text.decode(str, true)

  local scripts = {}
  for codepoint in mw.ustr.gcodepoint(str) do
    local script = lookup_script(codepoint)

    -- Ignore "Inherited", "Undetermined", or "Uncoded" scripts.
    if not (script == "Zyyy" or script == "Zinh" or script == "Zzzz")
      scripts[script] = true
    end
  end

  -- If scripts does not contain two or more keys,
  -- return first and only key (script code) in table.
  if not next(scripts, next(scripts)) then
    return next(scripts)
  end -- else return majority script, or else "Zzzz"?
end

function p.is_Latin(str)
  require "libraryUtil".checkType("get_best_script", 1, str, "string")
  str = mw.text.decode(str, true)

  -- Search for the leading bytes that introduce the UTF-8 encoding of the
  -- code points U+0340-U+10FFFF. If they are not found and there is at least
  -- one Latin-script character, the string counts as Latin, because the rest
  -- of the characters can only be Zyyy, Zinh, and Zzzz.
  -- The only scripts found below U+0370 (the first code point of the Greek
  -- and Coptic block) are Latn, Zyyy, Zinh, and Zzzz.
  -- See the codepage in the [[UTF-8]] article.
  if not str:find "[\205-\244]" then
    for codepoint in mw.ustr.gcodepoint(str) do
      if lookup_script(codepoint) == "Latn" then
        return true
      end
    end
  end

  local Latn = false

  for codepoint in mw.ustr.gcodepoint(str) do
    local script = lookup_script(codepoint)

    if script == "Latn" then
      Latn = true
    elseif not (script == "Zyyy" or script == "Zinh"
      or script == "Zzzz") then
      return false
    end
  end

  return Latn
end

-- Checks that a string contains only characters belonging to right-to-left
-- scripts, or characters of ignorable scripts.
function p.is_rtl(str)
```

```
require "libraryUtil".checkType("get_best_script", 1, str, "string")
str = mw.text.decode(str, true)

-- Search for the leading bytes that introduce the UTF-8 encoding of the
-- code points U+0580-U+10FFFF. If they are not found, the string can only
-- have characters from a left-to-right script, because the first code point
-- in a right-to-left script is U+0591, in the Hebrew block.
if not str:find "[\\214-\\244]" then
    return false
end

local result = false
local rtl = loader.scripts.rtl
for codepoint in mw.ustr.gcodepoint(str) do
    local script = lookup_script(codepoint)

    if rtl[script] then
        result = true
    elseif not (script == "Zyyy" or script == "Zinh"
                or script == "Zzzz") then
        return false
    end
end

return result
end

local function get_codepoint(args, arg)
    local codepoint_string = args[arg]
        or errorf(2, "Parameter %s is required", tostring(arg))
    local codepoint = tonumber(codepoint_string, 16)
        or errorf(2, "Parameter %s is not a code point in hexadecimal base",
            tostring(arg))
    if not (0 <= codepoint and codepoint <= 0x10FFFF) then
        errorf(2, "code point in parameter %s out of range", tostring(arg))
    end
    return codepoint
end

local function get_func(args, arg, prefix)
    local suffix = args[arg]
        or errorf(2, "Parameter %s is required", tostring(arg))
    suffix = mw.text.trim(suffix)
    local func_name = prefix .. suffix
    local func = p[func_name]
        or errorf(2, "There is no function '%s'", func_name)
    return func
end

-- This function allows any of the "lookup" functions to be invoked. The first
-- parameter is the word after "lookup_"; the second parameter is the code point
-- in hexadecimal base.
function p.lookup(frame)
    local func = get_func(frame.args, 1, "lookup_")
    local codepoint = get_codepoint(frame.args, 2)
    local result = func(codepoint)
    if func == p.lookup_name then
        -- Prevent code point labels such as <control-0000> from being
        -- interpreted as HTML tags.
        result = result:gsub("<", "&lt;")
    end
    return result
end
```



```
function p.is(frame)
  local func = get_func(frame.args, 1, "is_")

  -- is_Latin and is_valid_pagename take strings.
  if func == p.is_Latin or func == p.is_valid_pagename or func == p.is_rtl
    return (func(frame.args[2]))
  else -- The rest take code points.
    local codepoint = get_codepoint(frame.args, 2)
    return (func(codepoint)) -- Adjust to one result.
  end
end

end

return p
```