**How to generate p-codes**

(chapter in COD Evaluation and candidate creation **from ITOS)**

As a general rule, ITOS doesn't generate p-codes. However, if the case is very clear, the datasets are clean and we are given guidance to do so in rare cases we can. This document describes the procedure we have in place to do this.

You will likely have already determined that there are no egregious errors that must be addressed before generating p-codes. For that reason, this document assumes you will be geocoding a feature class stored in the working gdb, but it will work equally well for shapefiles or other data schemas.

1. Sort the data by both the name and by the lowest p-coded field that you will use to build new p-codes. For example, if you are generating p-codes for an admin3 feature class, you will sort the data by the *admin3name_xx* field, and by the *admin2P-code* field. These fields must already exist in the same feature class that you are generating p-codes for. In this example, we will generate p-codes for populated places, and we will build those p-codes off of the admin4 p-codes that exist in a field in the populated places feature class.
   a. Open ArcMap and load the dataset you want to generate p-codes for
   b. Open ArcToolbox ->Data Management Tools->General->Sort
   c. Create an output dataset and sort by the lowest admin p-code first, and then by feature name, both ascending. This will alphabetize your features by the feature name and assign new FIDs in alphabetic order.
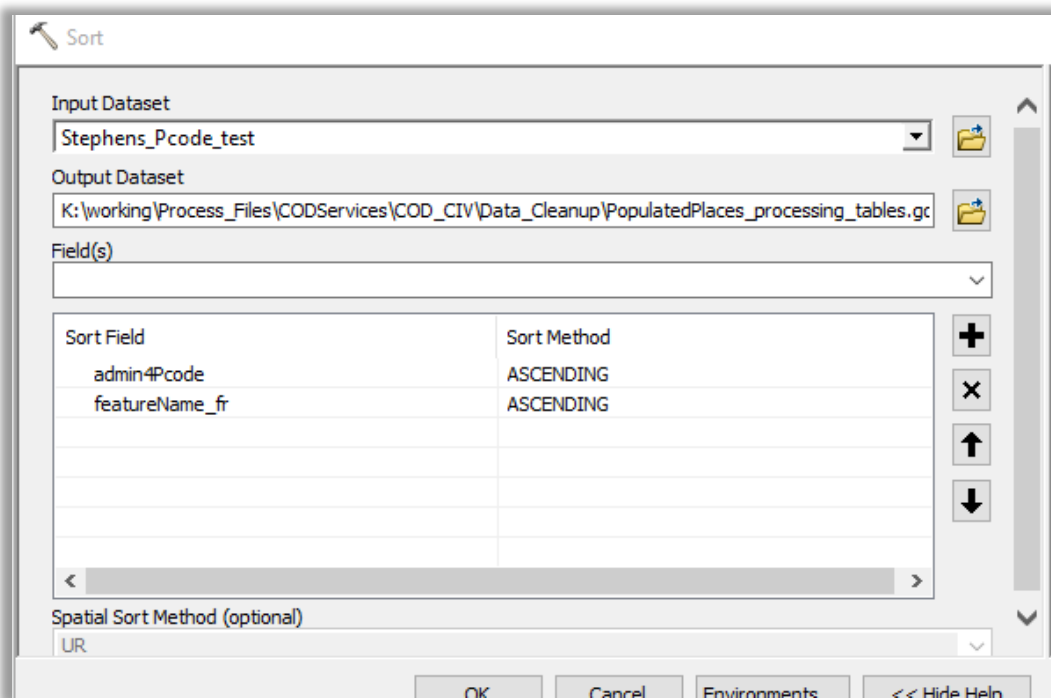
   d. Double check that the admin names are sorted alphabetically, and within each admin4 group, the feature names are sorted alphabetically.

Table

PopulatedPlaces_Sort

OBJECTID *	Shape *	featureName_fr	pcode	admin4Name_fr	admin4Pcode
1	Point	Abengourou	<Null>	Abengourou	CI09010204
2	Point	Aboidjikro	<Null>	Abengourou	CI09010204
3	Point	Abouadjikro	<Null>	Abengourou	CI09010204
4	Point	Adaou	<Null>	Abengourou	CI09010204
5	Point	Adonikro	<Null>	Abengourou	CI09010204
6	Point	Adou Koffikro	<Null>	Abengourou	CI09010204
7	Point	Ahuakro	<Null>	Abengourou	CI09010204
8	Point	Akoikro	<Null>	Abengourou	CI09010204
9	Point	Akoupe	<Null>	Abengourou	CI09010204
10	Point	Ameaokro	<Null>	Abengourou	CI09010204
11	Point	Amianso	<Null>	Abengourou	CI09010204
12	Point	Angbomankro	<Null>	Abengourou	CI09010204
13	Point	Anuanua	<Null>	Abengourou	CI09010204
14	Point	Appoisso	<Null>	Abengourou	CI09010204
15	Point	Appouéba	<Null>	Abengourou	CI09010204
16	Point	Assandekro	<Null>	Abengourou	CI09010204
17	Point	Assèkro	<Null>	Abengourou	CI09010204
18	Point	Asseman Biah	<Null>	Abengourou	CI09010204

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69	Point	Tanonkro	<Null>	Abengourou	CI09010204
70	Point	Tigorikro	<Null>	Abengourou	CI09010204
71	Point	Touzoukro	<Null>	Abengourou	CI09010204
72	Point	Yabra	<Null>	Abengourou	CI09010204
73	Point	Yobouekro	<Null>	Abengourou	CI09010204
74	Point	3Cocotiers	<Null>	Abidjan	CI14010105
75	Point	Abadjin-Doumé	<Null>	Abidjan	CI14010105
76	Point	Abèbroukoi	<Null>	Abidjan	CI14010105
77	Point	Abia-Abéti	<Null>	Abidjan	CI14010105
78	Point	Abia-Gnambo	<Null>	Abidjan	CI14010105
79	Point	Abia-Koumassi	<Null>	Abidjan	CI14010105
80	Point	Abidjan	<Null>	Abidjan	CI14010105
81	Point	Abidjan-Agban	<Null>	Abidjan	CI14010105
82	Point	Abidjan-Santè	<Null>	Abidjan	CI14010105
83	Point	Abobo-Baoulé	<Null>	Abidjan	CI14010105
84	Point	Abobo-té	<Null>	Abidjan	CI14010105
85	Point	Abouabou	<Null>	Abidjan	CI14010105
86	Point	Adiapodoumin	<Null>	Abidjan	CI14010105

2. Use the field calculator to assign p-codes.
   a. Right click on the p-code field and choose Field Calculator.
   b. Choose the Python Parser
   c. Load the *SequenceNumberByAdmin.cal* file

Table

PopulatedPlaces_Sort

OBJECTID *	Shape *	featureName_fr	pcode	admin4Name_fr	admin4Pcode
1	Point	Abengourou	<Null>	Abengourou	CI09010204
2	Point	Aboidjikro	<Null>	Ab	
3	Point	Abouadjkro	<Null>	Ab	
4	Point	Adaou	<Null>	Ab	
5	Point	Adonikro	<Null>	Ab	
6	Point	Adou Koffikro	<Null>	Ab	
7	Point	Ahuakro	<Null>	Ab	
8	Point	Akoikro	<Null>	Ab	
9	Point	Akoupe	<Null>	Ab	
10	Point	Ameaokro	<Null>	Ab	
11	Point	Amianso	<Null>	Ab	
12	Point	Angbomankro	<Null>	Ab	
13	Point	Anuanua	<Null>	Ab	
14	Point	Appoisso	<Null>	Ab	
15	Point	Appouéba	<Null>	Ab	
16	Point	Assandekro	<Null>	Ab	
17	Point	Assèkro	<Null>	Ab	
18	Point	Asseman Biah	<Null>	Ab	
19	Point	Assidjan	<Null>	Ab	
20	Point	Assoumankro	<Null>	Ab	
21	Point	Assoumoukro	<Null>	Ab	
22	Point	Betekro	<Null>	Ab	
23	Point	Bossematie	<Null>	Ab	
24	Point	Bossématié	<Null>	Ab	
25	Point	Boussoumantche	<Null>	Ab	
26	Point	Brahima Dembele	<Null>	Ab	
27	Point	Brou Kouadio	<Null>	Ab	
28	Point	Broukro	<Null>	Ab	
29	Point	Broukro	<Null>	Ab	
30	Point	Campement Forestier FAB	<Null>	Ab	
31	Point	Comoëkro	<Null>	Ab	
32	Point	Daboue Souman	<Null>	Ab	
33	Point	Dibi	<Null>	Ab	
34	Point	Dioulakro	<Null>	Ab	
35	Point	Dramanekro	<Null>	Ab	
36	Point	Dramouroukro	<Null>	Ab	
37	Point	Ebakro	<Null>	Abengourou	CI09010204

Field Calculator

Parser
- VB Script
- ● Python

Fields:
OBJECTID
Shape
featureName_fr
pcode
admin4Name_fr
admin4Pcode

☐ Show Codeblock

pcode =

About calculating fields

Load...

File operation aborted.

OK   Cancel

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d. In the calculator, change the autoIncrement to run over the lowest admin that you are building p-codes off of.

Field Calculator

Parser
- ○ VB Script
- ● Python

Fields:
OBJECTID
Shape
featureName_fr
pcode
admin4Name_fr
admin4Pcode

Type:
- ● Number
- ○ String
- ○ Date

Functions:
.conjugate()
.denominator()
.imag()
.numerator()
.real()
.as_integer_ratio()
.fromhex()
.hex()
.is_integer()
math.acos( )
math.acosh( )
math.asin( )

☑ Show Codeblock

Pre-Logic Script Code:
```
rec=0
admin = '00'
def autoIncrement(currentAdmin):
    global rec
    global admin
    pStart = 1
```

pcode =
```
autoIncrement( !iso3! )
```

About calculating fields

Clear   Load...   Save...

Data loaded.

OK   Cancel

->

Field Calculator

Parser
- ○ VB Script
- ● Python

Fields:
OBJECTID
Shape
featureName_fr
pcode
admin4Name_fr
admin4Pcode

Type:
- ● Number
- ○ String
- ○ Date

Functions:
.conjugate()
.denominator()
.imag()
.numerator()
.real()
.as_integer_ratio()
.fromhex()
.hex()
.is_integer()
math.acos( )
math.acosh( )
math.asin( )

☑ Show Codeblock

Pre-Logic Script Code:
```
rec=0
admin = '00'
def autoIncrement(currentAdmin):
    global rec
    global admin
    pStart = 1
```

pcode =
```
autoIncrement( !admin4Pcode! )
```

About calculating fields

Clear   Load...   Save...

OK   Cancel

e. The results should look like this:

PopulatedPlaces_Sort

OBJECTID *	Shape *	featureName_fr	pcode	admin4Name_fr	admin4Pcode
1	Point	Abengourou	CI0901020401	Abengourou	CI09010204
2	Point	Aboidjikro	CI0901020402	Abengourou	CI09010204
3	Point	Abouadjikro	CI0901020403	Abengourou	CI09010204
4	Point	Adaou	CI0901020404	Abengourou	CI09010204
5	Point	Adonikro	CI0901020405	Abengourou	CI09010204
6	Point	Adou Koffikro	CI0901020406	Abengourou	CI09010204
7	Point	Ahuakro	CI0901020407	Abengourou	CI09010204
8	Point	Akoikro	CI0901020408	Abengourou	CI09010204
9	Point	Akoupe	CI0901020409	Abengourou	CI09010204
10	Point	Ameaokro	CI0901020410	Abengourou	CI09010204
11	Point	Amianso	CI0901020411	Abengourou	CI09010204
12	Point	Angbomankro	CI0901020412	Abengourou	CI09010204
13	Point	Anuanua	CI0901020413	Abengourou	CI09010204
14	Point	Appoisso	CI0901020414	Abengourou	CI09010204
15	Point	Appouéba	CI0901020415	Abengourou	CI09010204
16	Point	Assandekro	CI0901020416	Abengourou	CI09010204
17	Point	Assèkro	CI0901020417	Abengourou	CI09010204
18	Point	Asseman Biah	CI0901020418	Abengourou	CI09010204
19	Point	Assidjan	CI0901020419	Abengourou	CI09010204
20	Point	Assoumankro	CI0901020420	Abengourou	CI09010204
21	Point	Assoumoukro	CI0901020421	Abengourou	CI09010204
22	Point	Betekro	CI0901020422	Abengourou	CI09010204
23	Point	Bossematie	CI0901020423	Abengourou	CI09010204

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65	Point	Pokoukro	CI0901020465	Abengourou	CI09010204
66	Point	Sampikro	CI0901020466	Abengourou	CI09010204
67	Point	Sankoidiokro	CI0901020467	Abengourou	CI09010204
68	Point	Souleymane	CI0901020468	Abengourou	CI09010204
69	Point	Tanonkro	CI0901020469	Abengourou	CI09010204
70	Point	Tigorikro	CI0901020470	Abengourou	CI09010204
71	Point	Touzoukro	CI0901020471	Abengourou	CI09010204
72	Point	Yabra	CI0901020472	Abengourou	CI09010204
73	Point	Yobouekro	CI0901020473	Abengourou	CI09010204
74	Point	3Cocotiers	CI1401010501	Abidjan	CI14010105
75	Point	Abadjin-Doumé	CI1401010502	Abidjan	CI14010105
76	Point	Abèbroukoi	CI1401010503	Abidjan	CI14010105
77	Point	Abia-Abéti	CI1401010504	Abidjan	CI14010105
78	Point	Abia-Gnambo	CI1401010505	Abidjan	CI14010105
79	Point	Abia-Koumassi	CI1401010506	Abidjan	CI14010105

f. The script is set up to create a 2 digit p-code appended to the p-code of the lowest admin unit. If there are many more features, that is, if for any given admin4 level, you anticipate having over 99 or over 999 features then you need to modify the code. Specifically, the return string should be lengthened. The current version:

```
rec=0
admin = '00'
def autoIncrement(currentAdmin):
  global rec
  global admin
  pStart = 1
```

```
  pInterval = 1
  if (rec == 0 or currentAdmin <> admin):
    rec = pStart
    admin = currentAdmin
  else:
    rec += pInterval
  return admin + str(rec).zfill(2)
```

To create a 3 digit pocode counter, increase the zfill to 3:

```
return admin + str(rec).zfill(3)
```