Topcat introduction + examples of classification algorithms
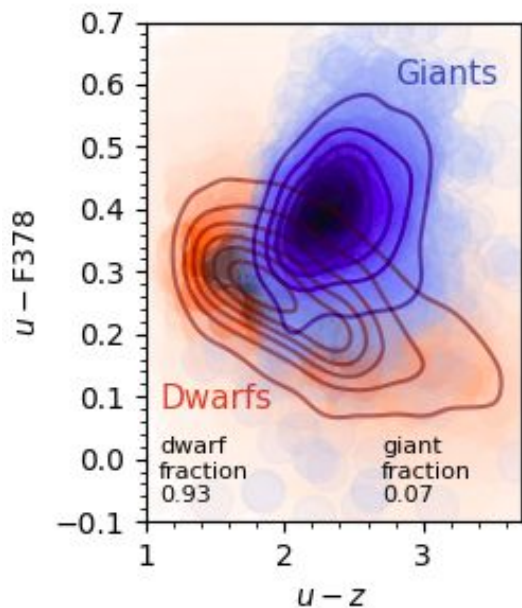
Hands-on session

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For this you will need:
- Topcat
- Python, to run a python.py script
  - scikit-learn
  - numpy
  - pandas
  - (optional) matplotlib
  - (optional) scipy

We will use topcat to crossmatch S-PLUS and SSPP samples. And we will apply some selections to (kind off) reproduce this plot:

Then, we will use the data we produced, together with a python script, to test different classification algorithm and compare their results:
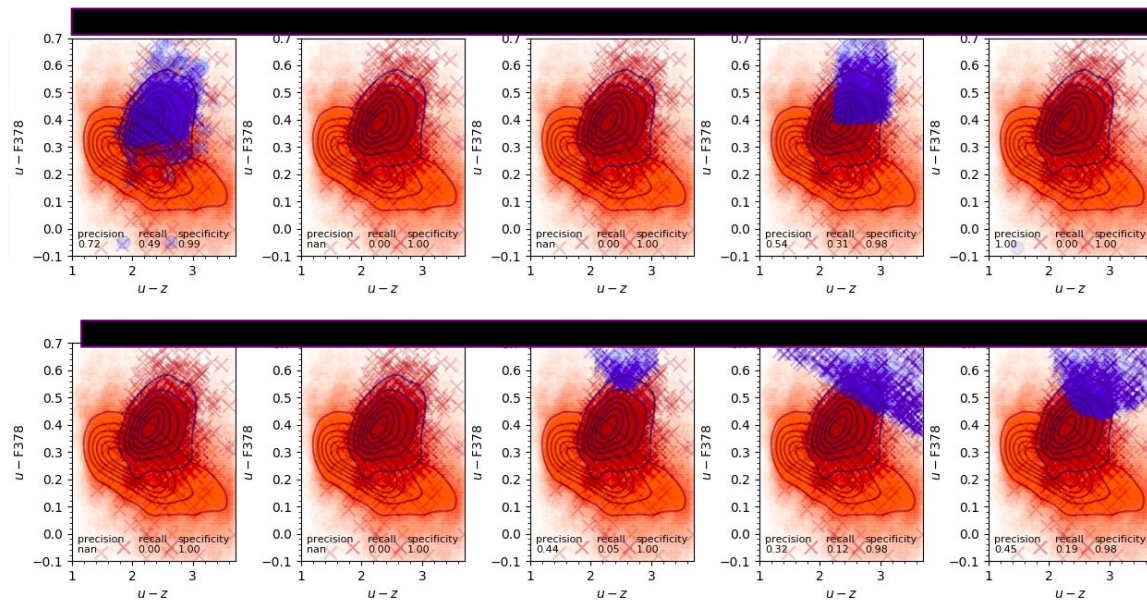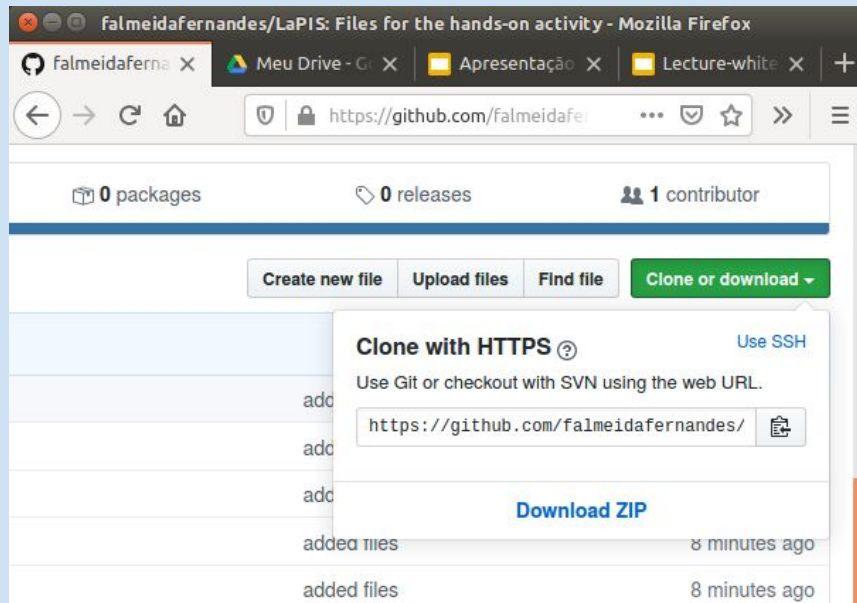
Getting the data

```
.../your-directory$ git clone https://github.com/falmeidafernandes/LaPIS.git
```
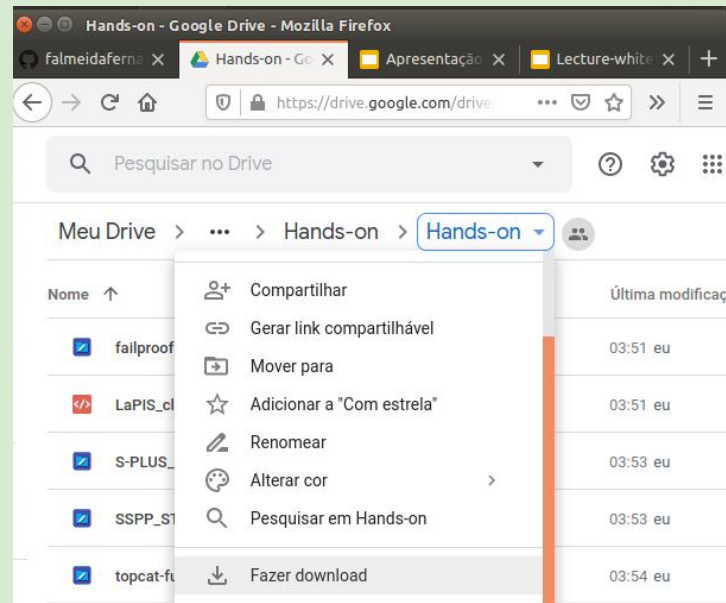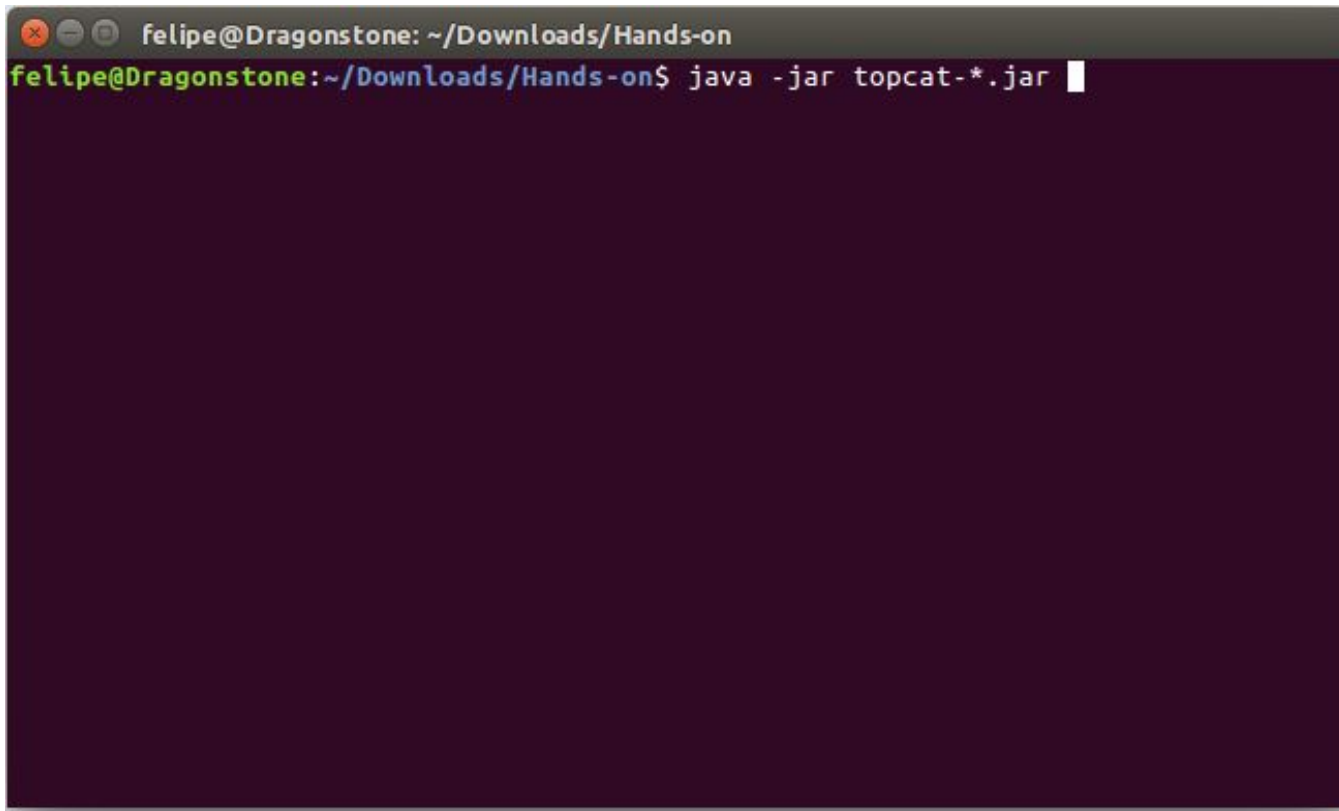
Option 2 - from github page

https://github.com/falmeidafernandes/LaPIS

Option 3 - google drive

http://tiny.cc/zmr9jz

1) Open Topcat


```
😠⊖⊙  felipe@Dragonstone: ~/Downloads/Hands-on
felipe@Dragonstone:~/Downloads/Hands-on$ java -jar topcat-*.jar
```
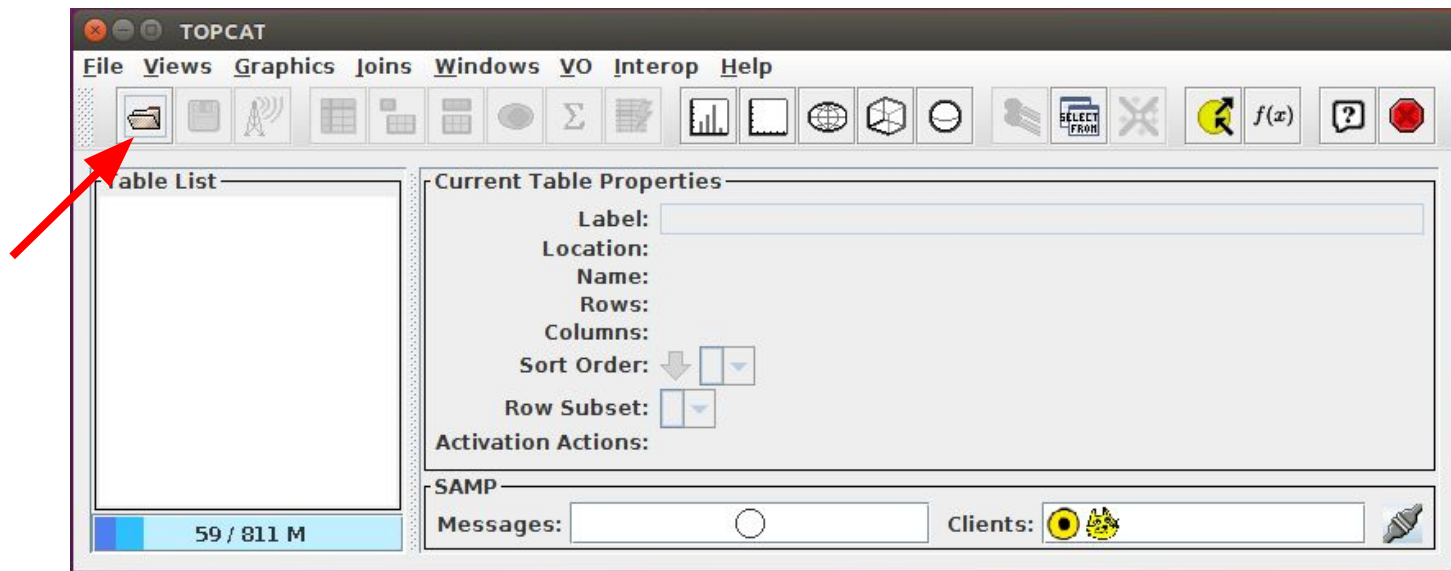
On unix systems:

```
.../Hands-on$ chmod +x topcat
.../Hands-on$ topcat
```
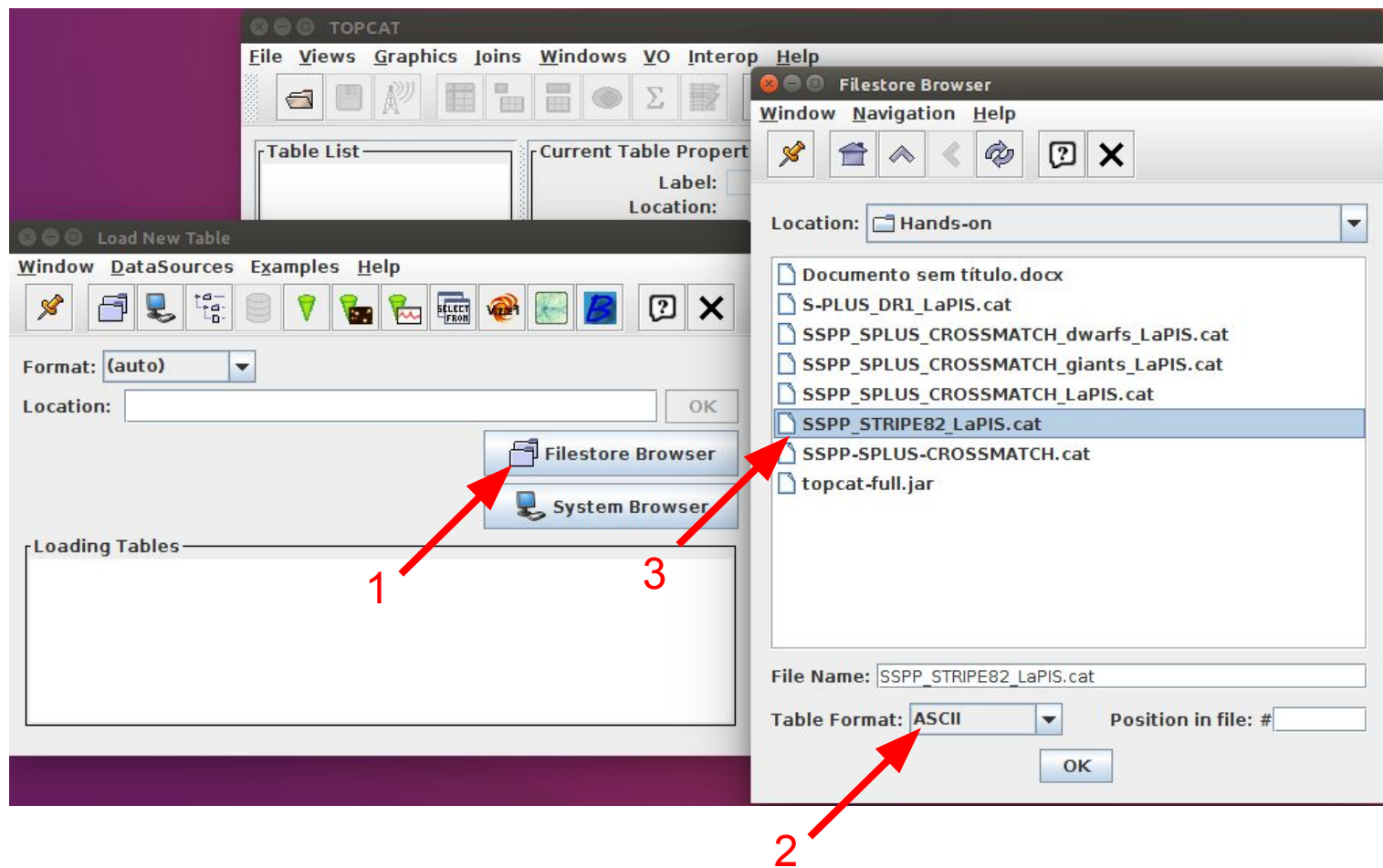
On non-unix systems:

```
.../Hands-on$ java -jar topcat-*.jar
```
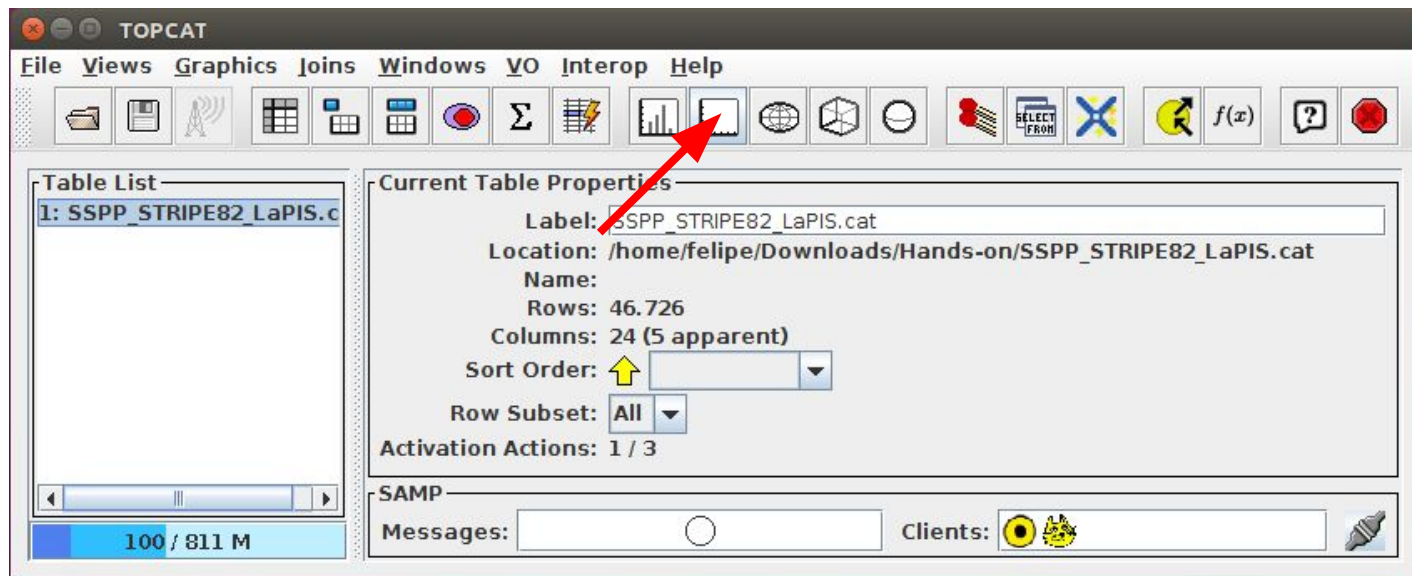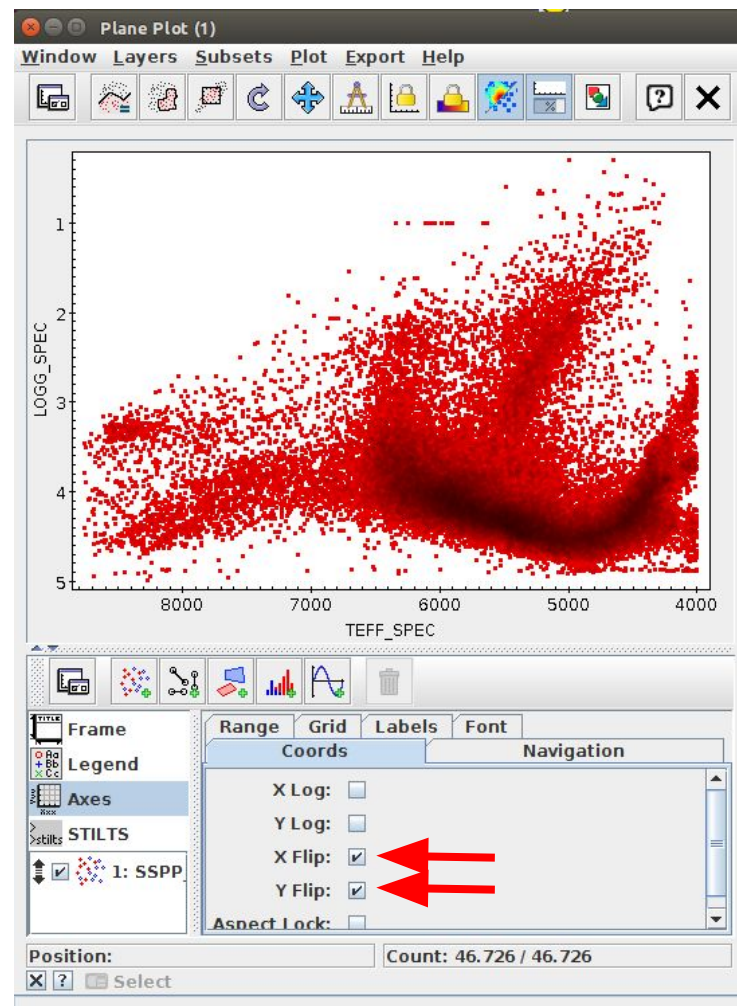
1) Open Topcat

2) Load the SSPP sample
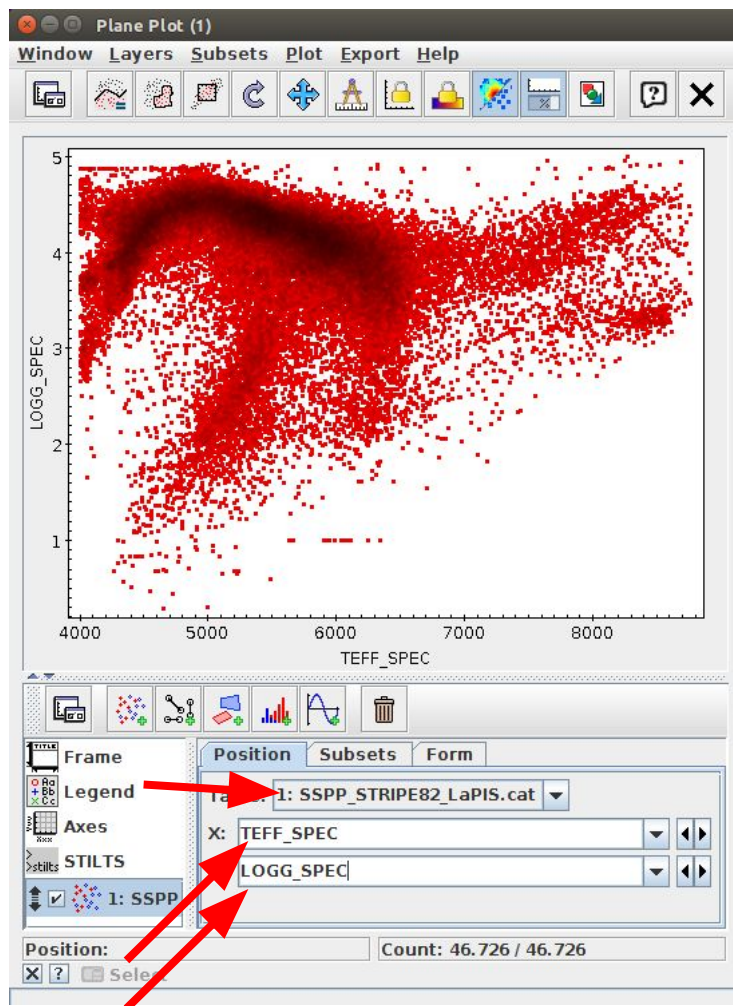
1) Open Topcat

2) Load the SSPP sample

1) Open Topcat

2) Load the SSPP sample

3) Plot spec data

1) Open Topcat

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3) Plot spec data

4) Let's get rid of hot and cold dwarfs

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5) Select the giants

1) Open Topcat

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5) Select the giants

1) Open Topcat

2) Load the SSPP sample

3) Plot spec data

4) Let's get rid of hot and cold dwarfs

5) Select the giants

6) Create a flag column

1) Open Topcat

2) Load the SSPP sample

3) Plot spec data

4) Let's get rid of hot and cold dwarfs
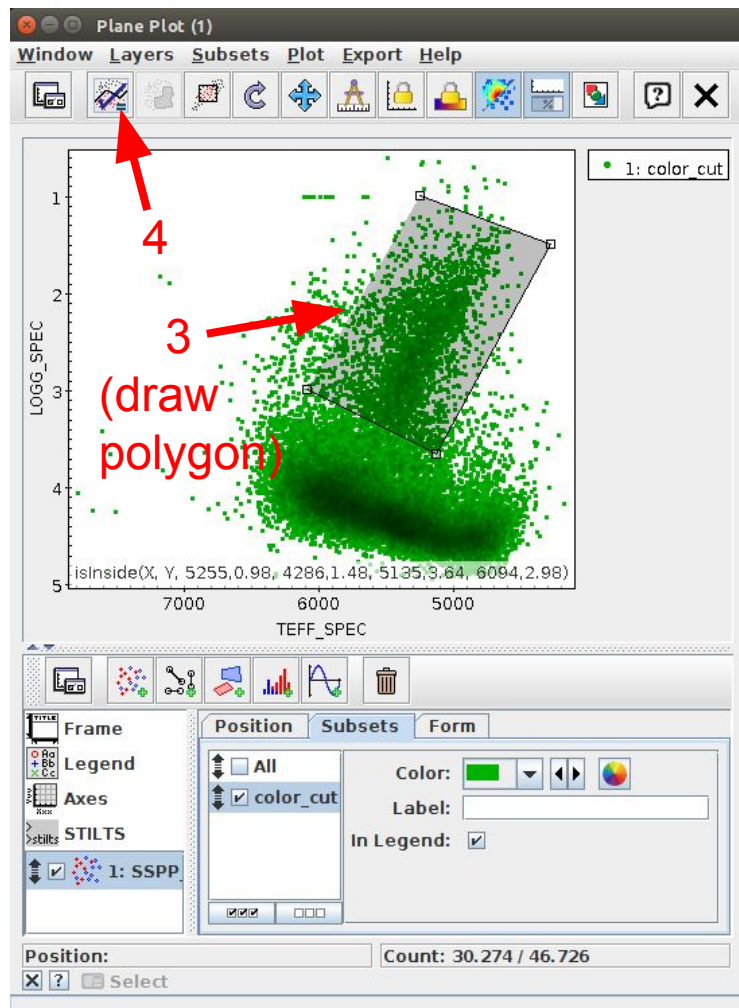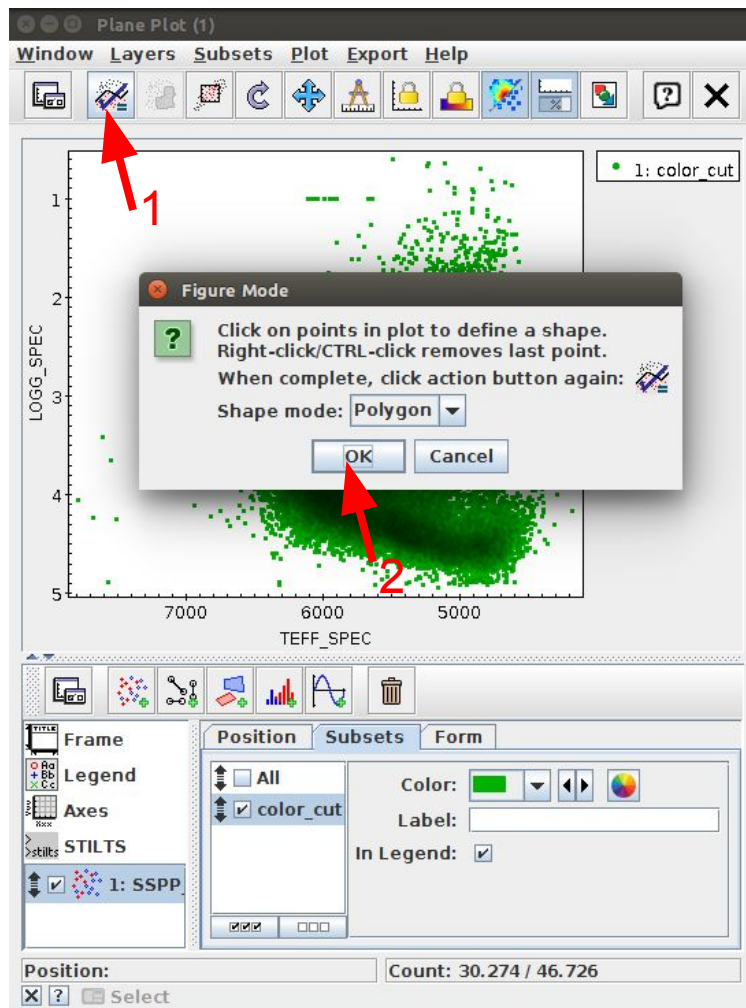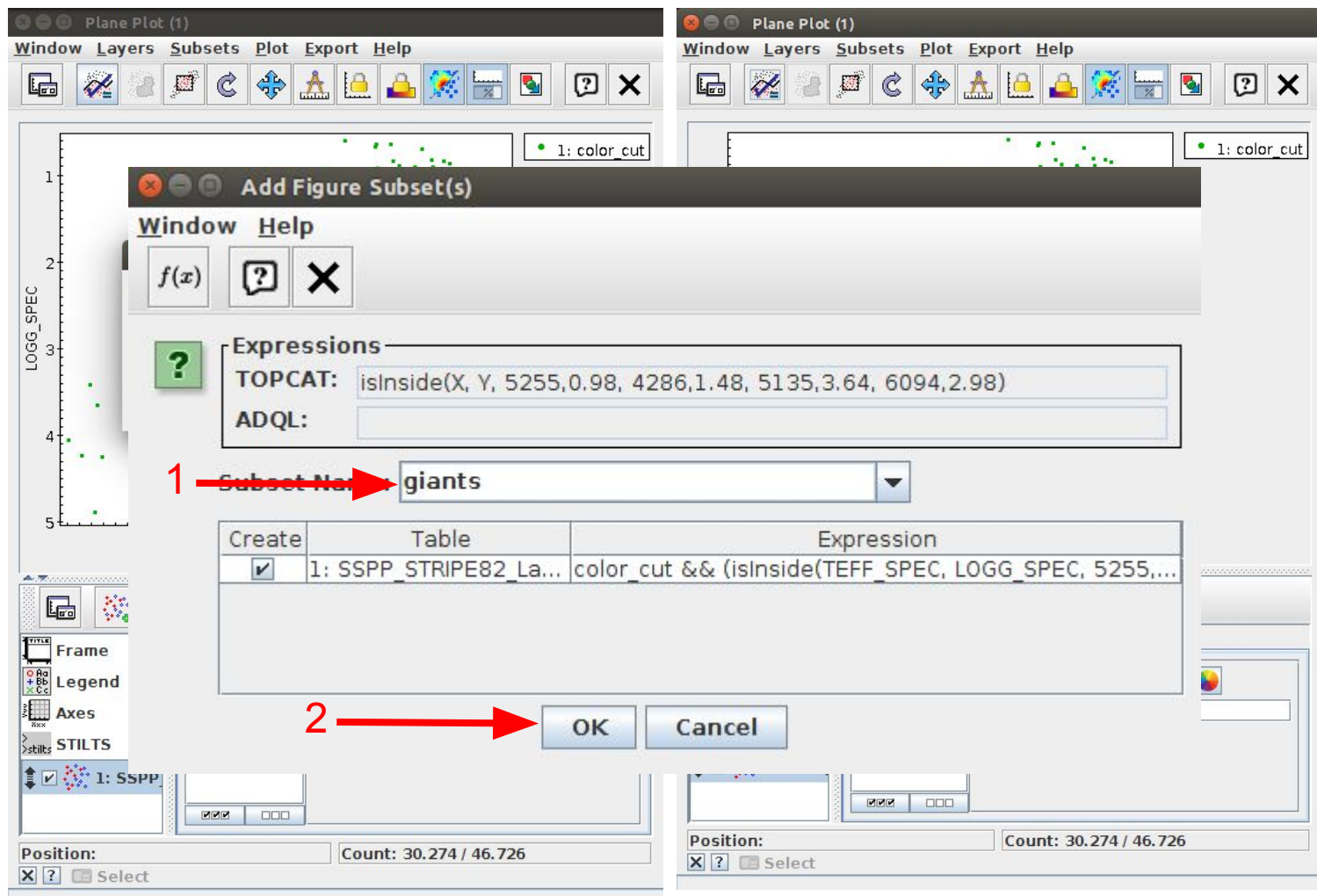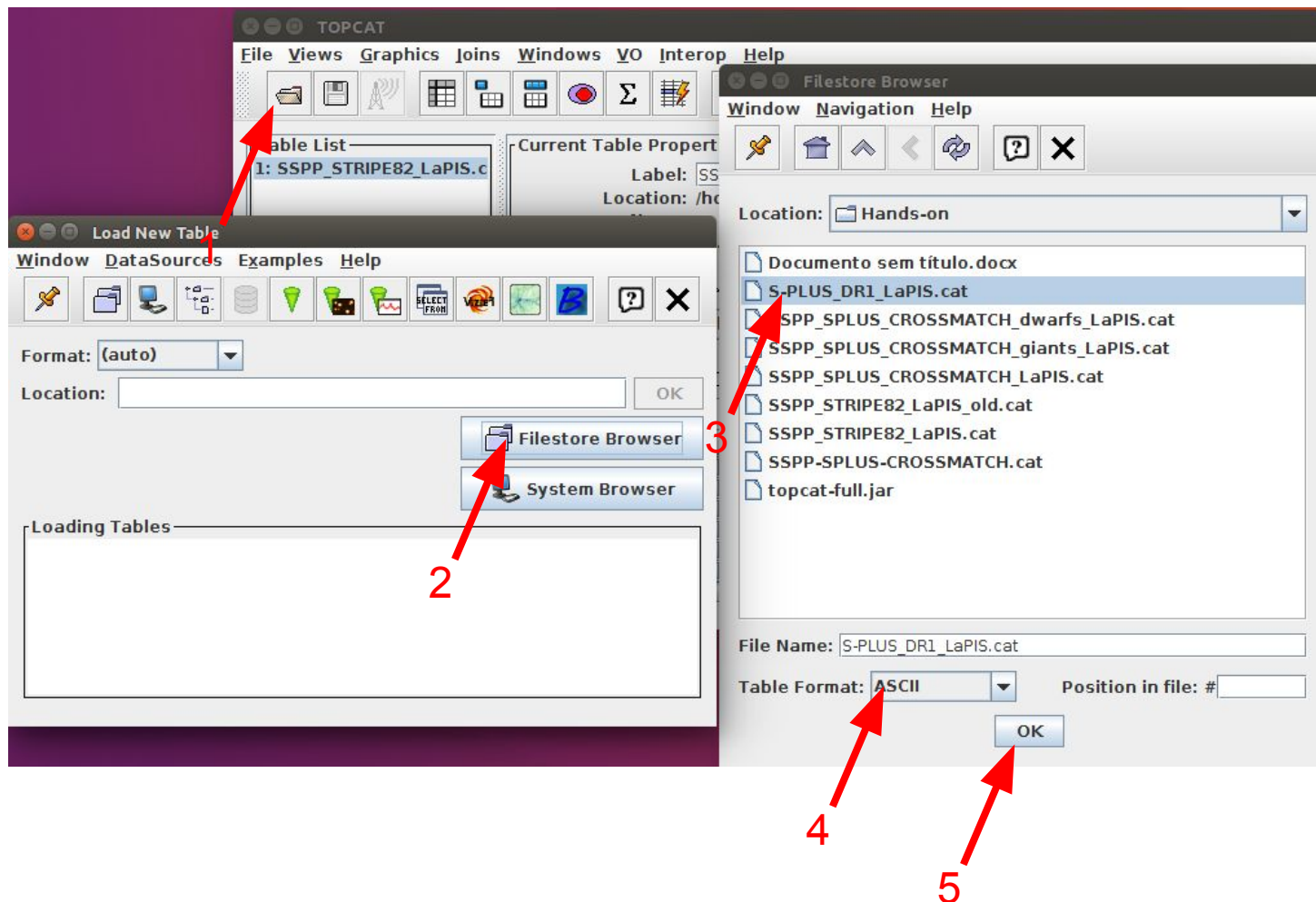
5) Select the giants

6) Create a flag column

7) Load S-PLUS DR1

1) Open Topcat

2) Load the SSPP sample

3) Plot spec data

4) Let's get rid of hot and cold dwarfs

5) Select the giants

6) Create a flag column

7) Load S-PLUS DR1

8) Crossmatch both catalogs
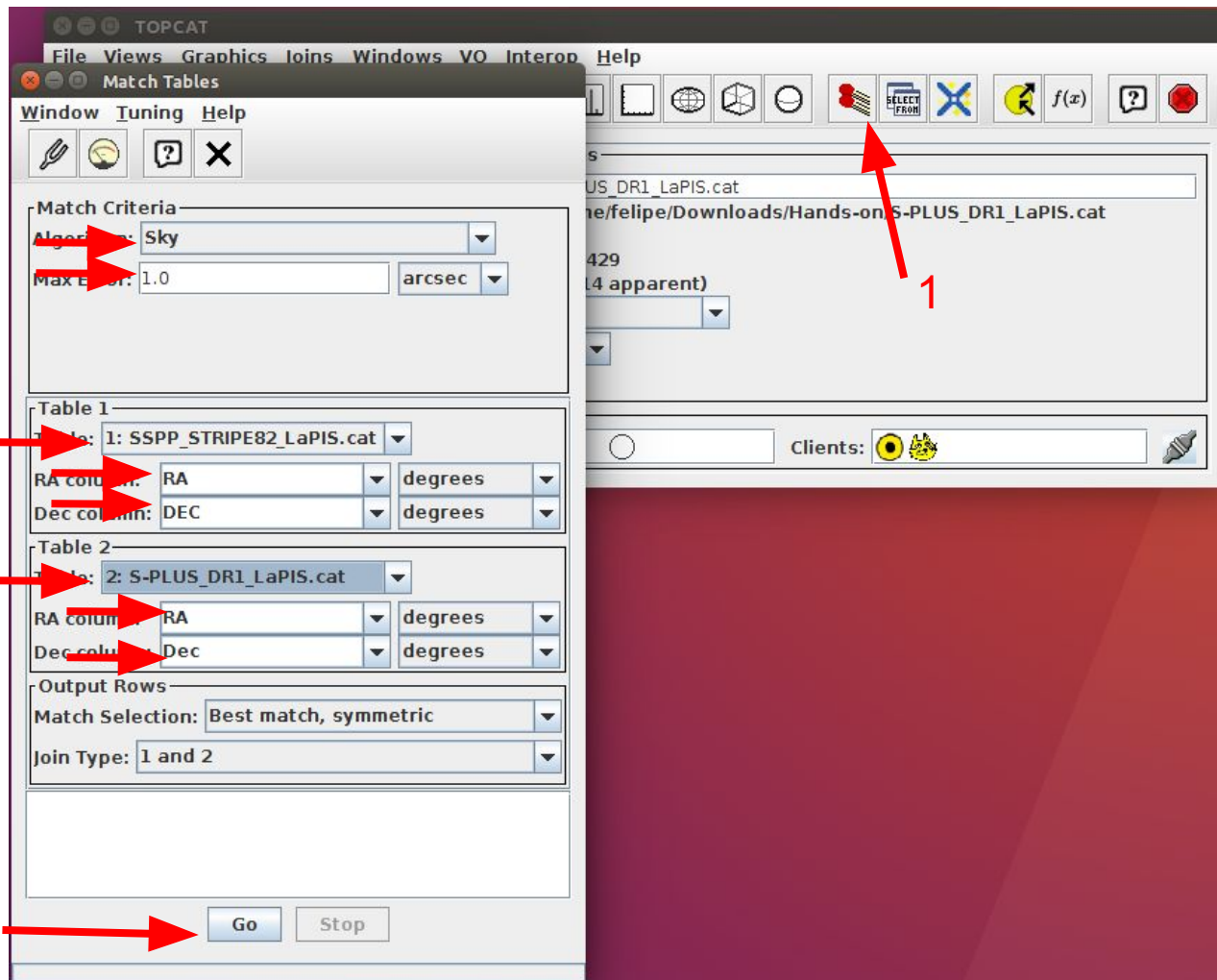
1

last

Match Tables

Window Tuning Help

Match Criteria

Algorithm: Sky

Max Error: 1.0   arcsec

Table 1

Table: 1: SSPP_STRIPE82_LaPIS.cat

RA column: RA   degrees

Dec column: DEC   degrees

Table 2

Table: 2: S-PLUS_DR1_LaPIS.cat

RA column: RA   degrees

Dec column: Dec   degrees

Output Rows

Match Selection: Best match, symmetric

Join Type: 1 and 2

Go   Stop

TOPCAT

File Views Graphics Joins Windows VO Interop Help

f(x)

US_DR1_LaPIS.cat
he/felipe/Downloads/Hands-on S-PLUS_DR1_LaPIS.cat

429
(4 apparent)

Clients:

1) Open Topcat

2) Load the SSPP sample

3) Plot spec data

4) Let's get rid of hot and cold dwarfs

5) Select the giants

6) Create a flag column

7) Load S-PLUS DR1

8) Save the table

1) Open Topcat

2) Load the SSPP sample

3) Plot spec data

4) Let's get rid of hot and cold dwarfs

5) Select the giants

6) Create a flag column

7) Load S-PLUS DR1

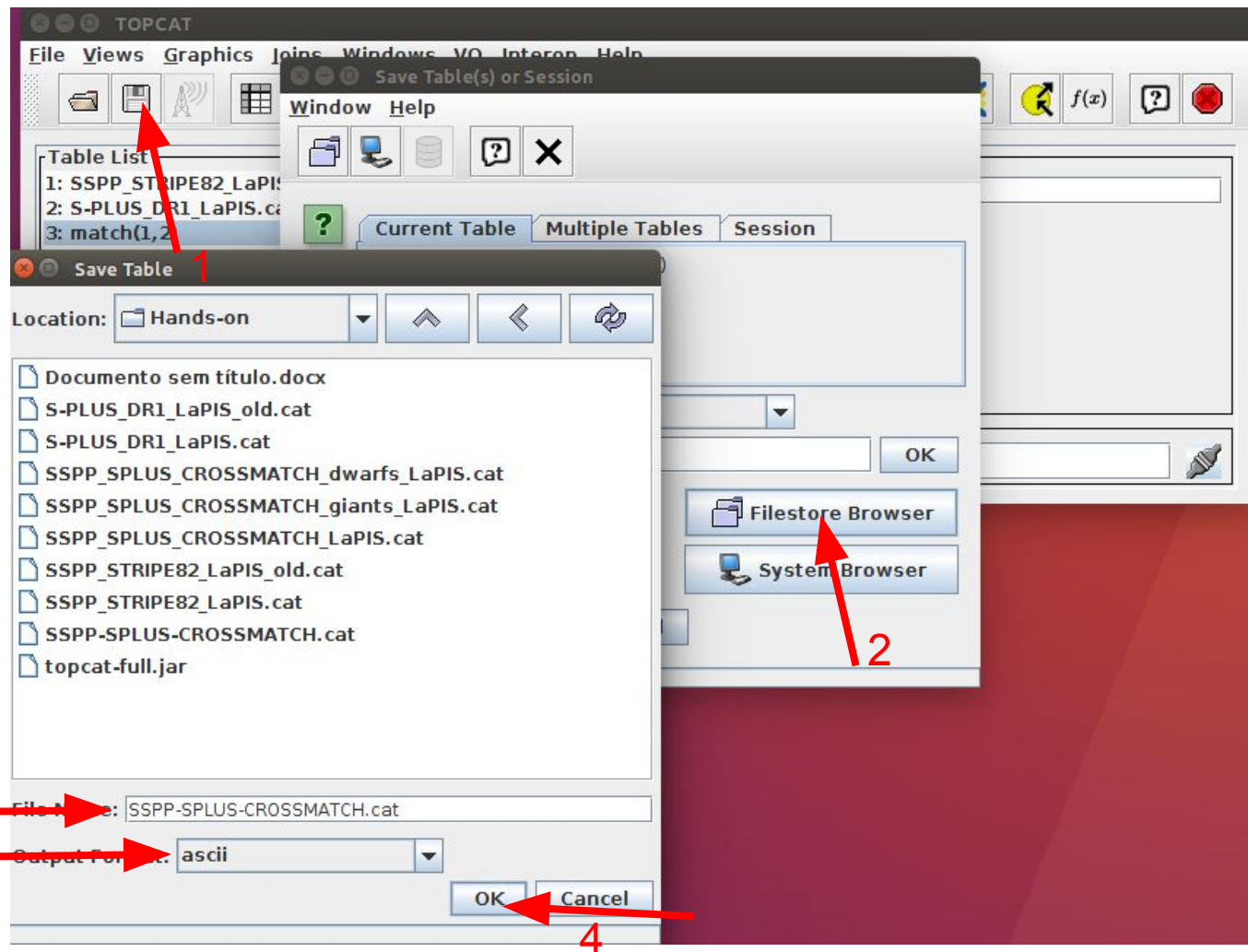8) Save the table

We're done. But let's make some plots.
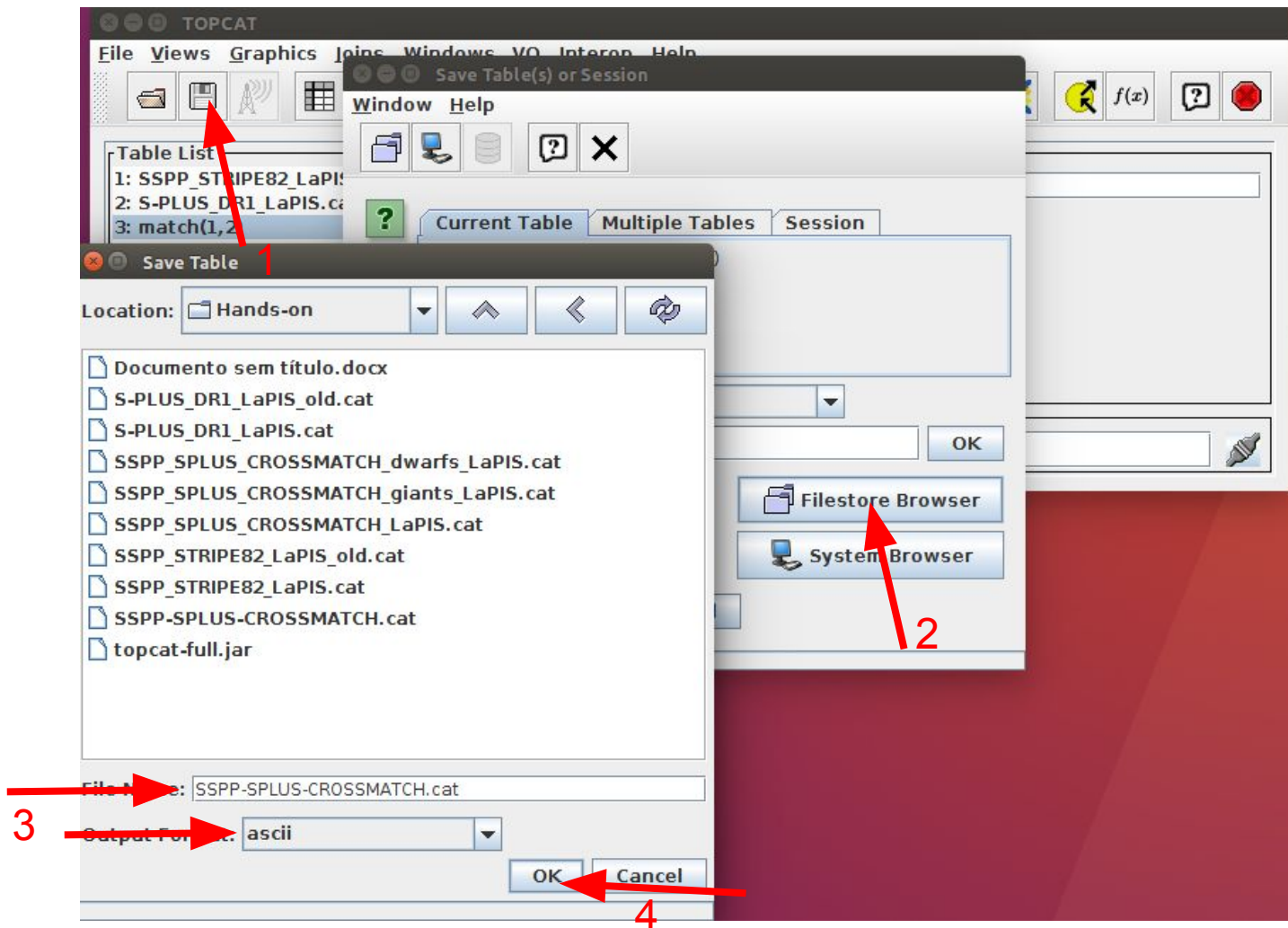
1) Open Topcat

2) Load the SSPP sample

3) Plot spec data

4) Let's get rid of hot and cold dwarfs

5) Select the giants

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7) Load S-PLUS DR1

8) Save the table

We're done. But let's make some plots.

1) Open Topcat

2) Load the SSPP sample

3) Plot spec data

4) Let's get rid of hot and cold dwarfs

5) Select the giants

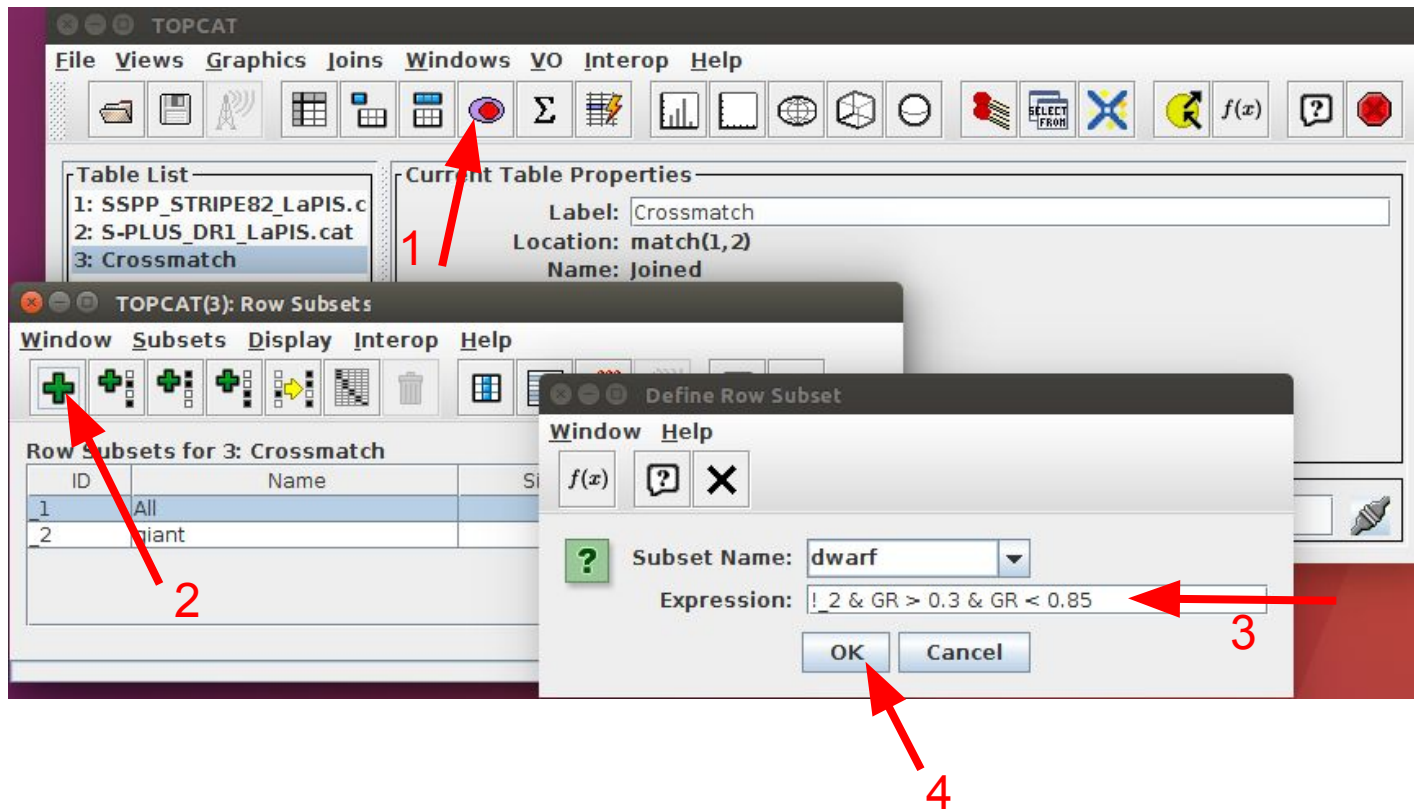6) Create a flag column

7) Load S-PLUS DR1

8) Save the table

We're done. But let's make some plots.

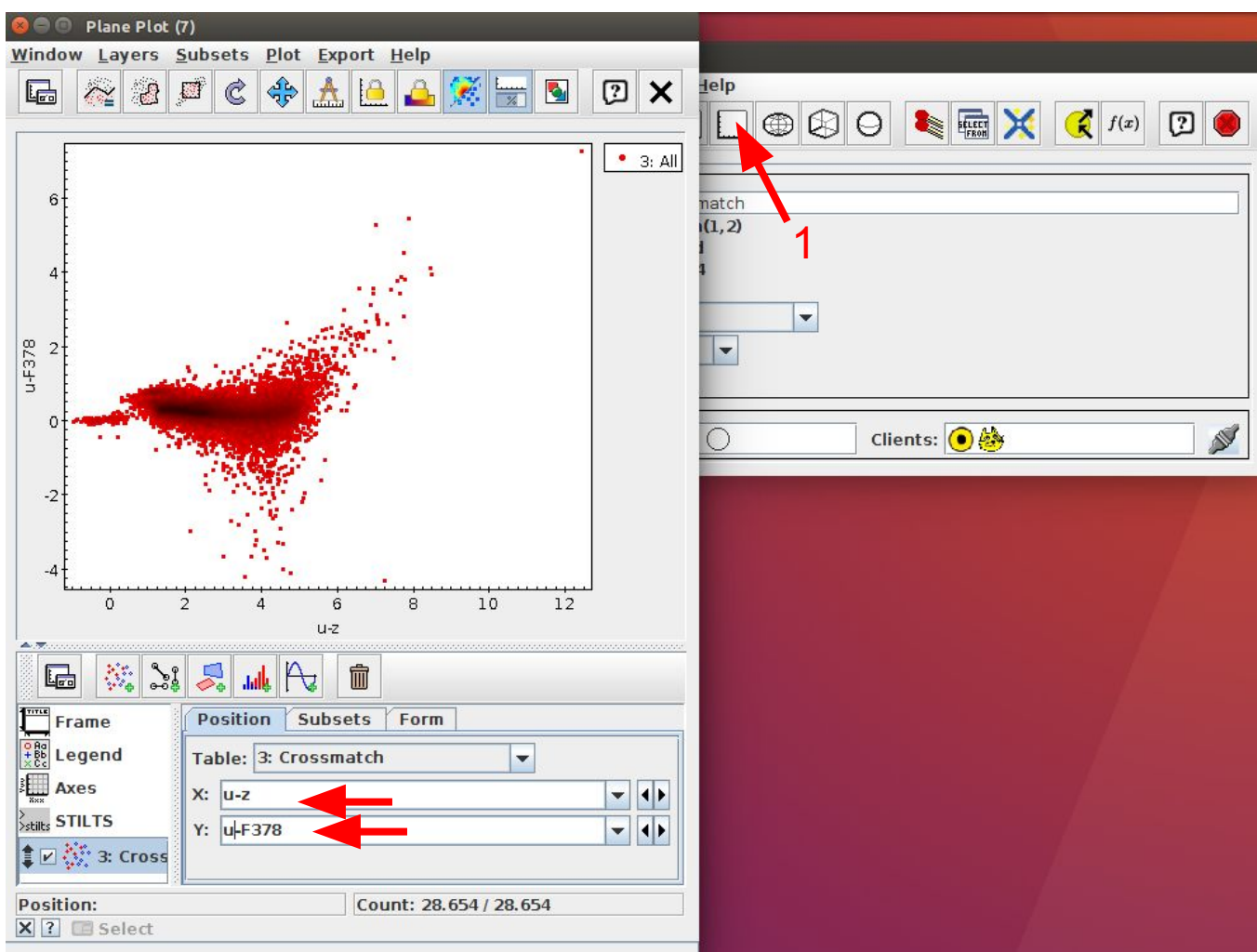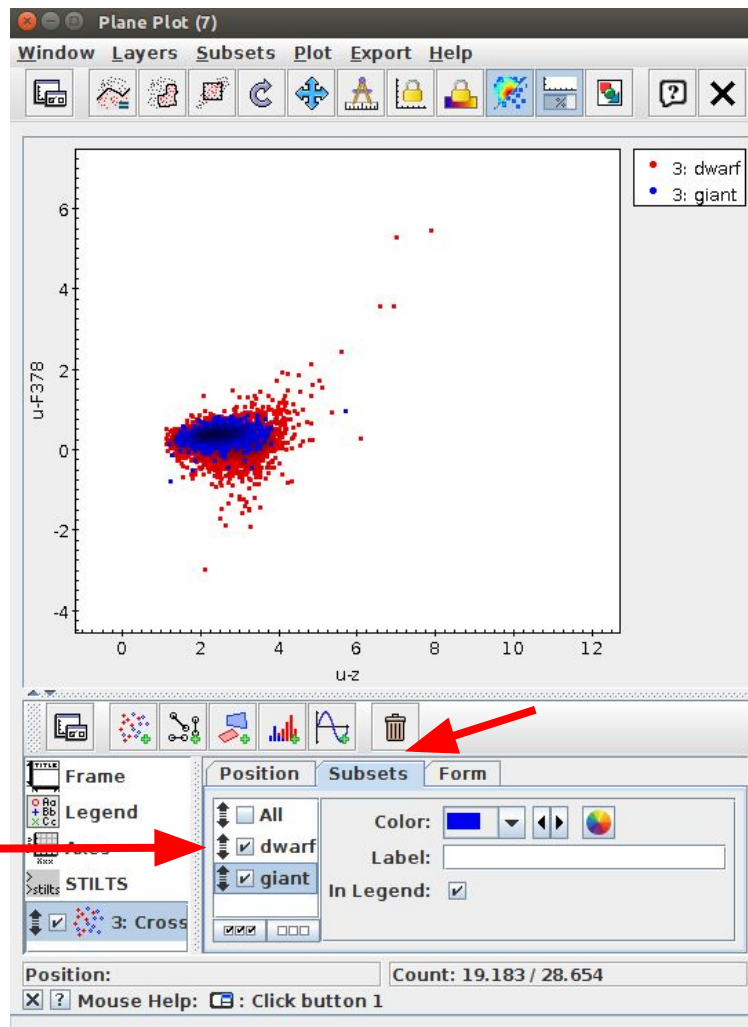1) Open Topcat

2) Load the SSPP sample

3) Plot spec data

4) Let's get rid of hot and cold dwarfs

5) Select the giants

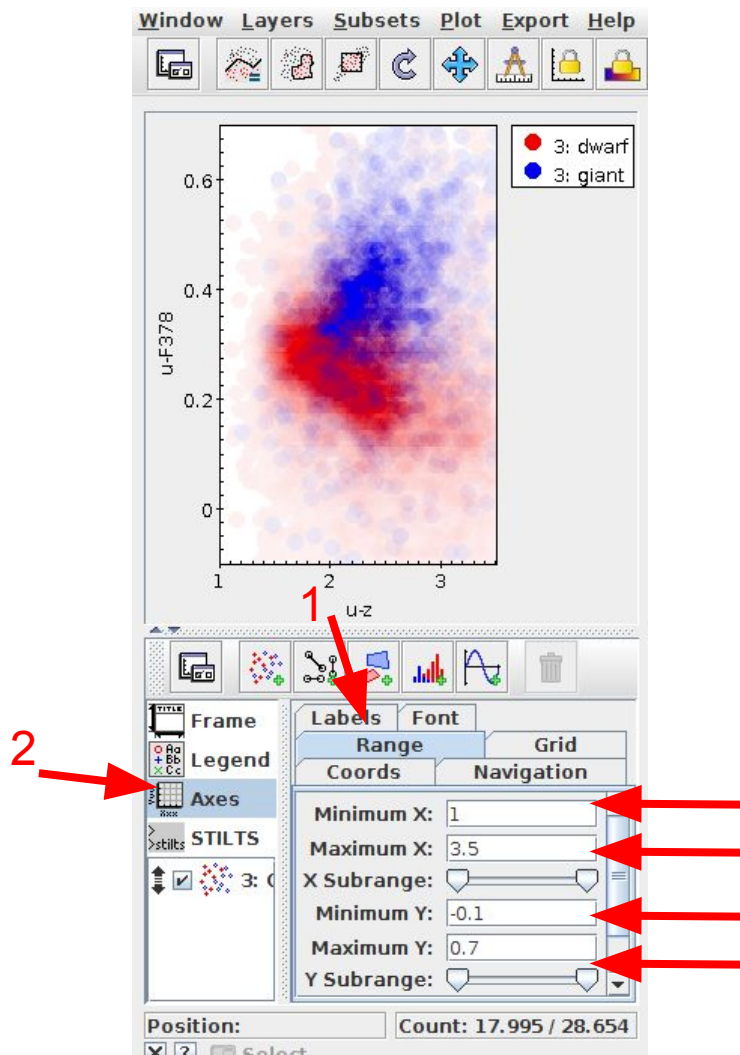6) Create a flag column

7) Load S-PLUS DR1

8) Save the table

We're done. But let's make some plots.

select only dwarf and giant. Change their order.

1) Open Topcat

2) Load the SSPP sample

3) Plot spec data

4) Let's get rid of hot and cold dwarfs

5) Select the giants

6) Create a flag column

7) Load S-PLUS DR1

8) Save the table

We're done. But let's make some plots.

1) Open Topcat

2) Load the SSPP sample

3) Plot spec data

4) Let's get rid of hot and cold dwarfs

5) Select the giants

6) Create a flag column

7) Load S-PLUS DR1

8) Save the table

We're done. But let's make some plots.
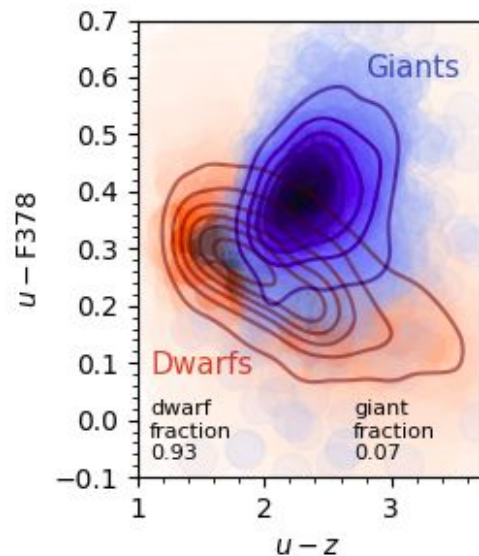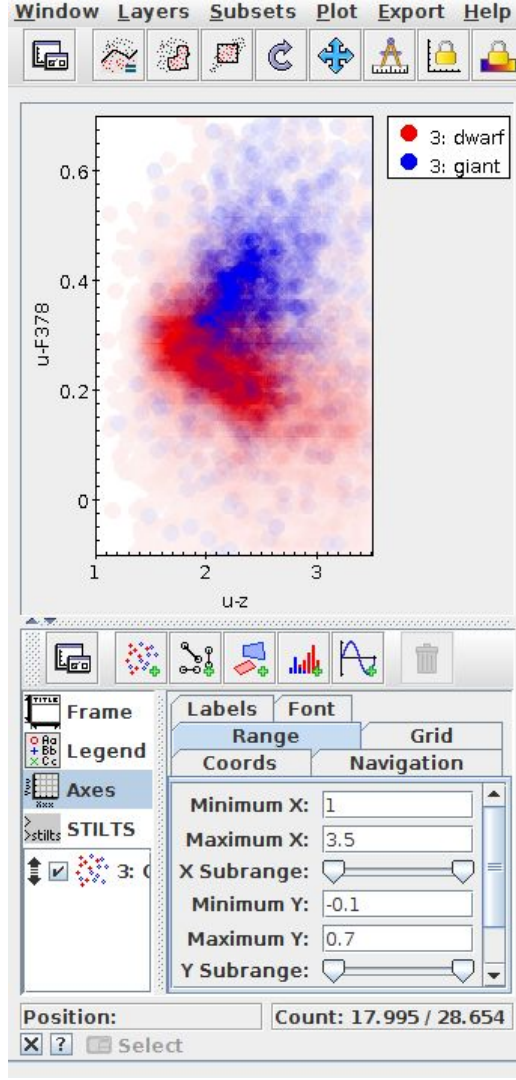
Activity

Use the LaPIS_classifier_example.py script to find out which classifier algorithm works better in this case.