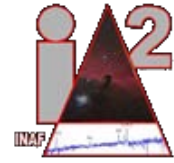


VO Day & Friends
17-19 December 2013
INAF-OACT



Treasure Hunt

three simple exercises to test what you learned

Marco Molinaro
INAF-OACTs IA2



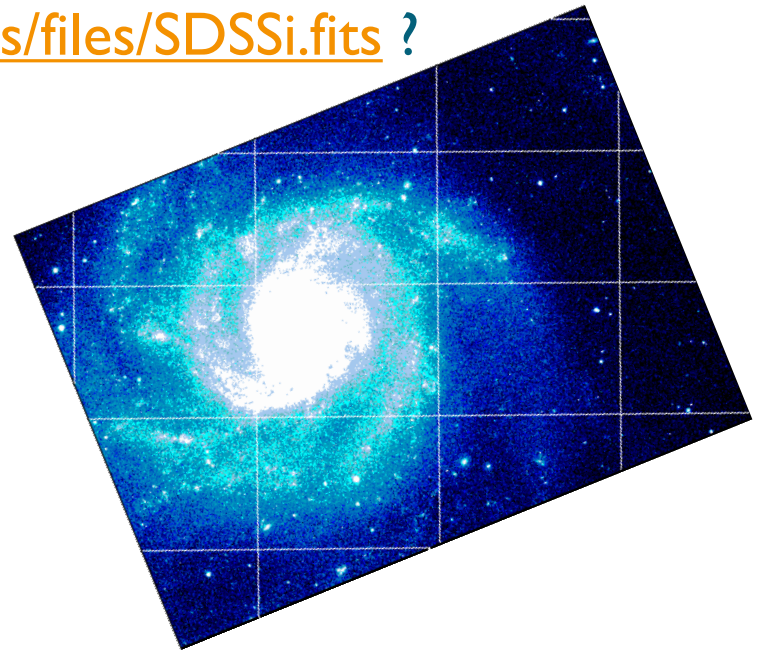
Adapted from M. Fitzpatrick & M. Allen «Treasure Hunts» and with the contribution of M. Demleitner

Rules

- ▶ 3 questions
 - ▶ 5-10 minutes per question
 - ▶ Answer revealed after each question
 - ▶ Solutions revealed after all questions
- ▶ Scoring:
 - ▶ 1 point if you have an answer
 - ▶ 2 points if you have the right answer
 - ▶ Challenges for alternative 'right' answer allowed

Question 1

- ▶ How many 2MASS point sources fall within the area covered by the image:
 - ▶ <http://vobs.astro.it/vofriends/files/SDSSi.fits> ?
- ▶ (Bonus): what galaxy is it?



Answer Q1

- ▶ 94
- ▶ M101
 - ▶ Pinwheel, NGC5457, APG26, UGC8981, ...

Question 2

- ▶ How many Bautz-Morgan type II Abell clusters are within 10 degrees of the south galactic pole?
 - ▶ (only type II, no subtypes)
 - ▶ (Abell+ 1989)



Answer Q2

▶ 18

Question 3

- ▶ How many resources that talk about quasars in their titles are there in the VO registry?
- ▶ One of them is a Cone Search that talks about Quasars behind the Magellanic system: can you find its access URL?
- ▶ (extra) use the above access URL to find the declination of the quasar with largest J-K colour index.
 - ▶ (use <http://dc.g-vo.org/tap> to search the VO registry)
 - ▶ (access_url is in rr.interface)
 - ▶ (Cone Search has cs:conesearch as rr.capability.cap_type)

Answer Q3

- ▶ 195
- ▶ <http://vizier.u-strasbg.fr/viz-bin/votable/-A?source=J/A+A/549/A29&>
 - ▶ <ivo://cds.vizier/j/a+a/549/a29>
 - ▶ Quasars behind the Magellanic system (Cioni+, 2013)
- ▶ DEC: -67.54 (J-K: 1.944)

Solutions – Q1

The screenshot displays the Aladin v7.5 astronomical software interface. The main window shows a star field with a central bright source. A 'Server selector' dialog is open, showing a list of surveys available in VizieR. The '2MASS-PSC' survey is selected. Below the dialog, a table of survey data is visible.

Server selector dialog:

- Target (ICRS, na): 1403 13.50 +54 22 46.7
- Survey: 2MASS-PSC
- Radius: 8.35'
- Buttons: Reset, Clear, SUBMIT, Close

Survey List:

Name	Description	Nb of KRows
2MASS-PSC	The 2MASS Point Source and 2MASS6x catalogues ...	470993
2MASX	The 2MASS Extended Source Catalogue (2003)	1648
AKARI	AKARI IRC (9/18um) and FIS (60-160um)all-sky Sur...	1298
CMC14	The Carlsberg Meridian Catalog 14 (-30<Dec<+50)	95858
GALEX	GALEX-DR5 sources from AIS and MIS (2011)	77864
GSC2.3	The GSC-II Catalog, Version 2.3.2 (2006)	945592
PPMXL	PPMXL catalog of positions and proper motions (20...	910469
UCAC4	The USNaval CCD Astrograph Catalog, 4th Releas...	113780
UKIDSS	GPS/DR6)+LAS(9)+GCS(DR9)+DXS(9)	727073
USNO-A2	The USNO-A2.0 Catalog	526281
USNO-B1	The USNO-B1.0 Catalog	1045913
ASCC-2.5	All-Sky Compiled Catalog of 2.5M* (2003)	2501
Tycho-2	The Tycho-2 Catalog (08-Feb-2000)	2540

Data Table:

V	RAJ2000	DEJ2000	2MASS	Jmag	e Jmag	Hmag	e Hmag	Kmag	e Kmag	Q...	R...	B...	C...	X:A
VizieR	210.822881	+54.461666	14031749+5427419	16.037	0.073	15.369	0.095	15.037	0.126	AAA	222	111	000	0 0
VizieR	210.815629	+54.457893	14031575+5427284	13.662	0.031	13.274	0.033	13.135	0.035	AAA	222	111	000	0 0
VizieR	210.891379	+54.462070	14033393+5427434	16.527	0.117	15.854	0.147	15.595	0.206	BBC	222	111	000	0 0
VizieR	210.900242	+54.443485	14033605+5426365	16.347	0.100	15.731	0.142	17.242		ABU	220	110	000	0 0
VizieR	210.902735	+54.477890	14033665+5428404	16.133	0.081	15.605	0.137	15.109	0.135	ABB	222	111	000	0 0
VizieR	210.896021	+54.437679	14033504+5426156	13.497	0.023	13.101	0.029	13.000	0.030	AAA	222	111	000	0 0
VizieR	210.973276	+54.458008	14033558+5427288	16.013	0.085	15.247	0.089	14.787	0.112	AAB	222	111	000	0 0
VizieR	210.956425	+54.460953	14034954+5427394	14.768	0.034	14.110	0.038	13.987	0.055	AAA	222	112	00c	0 0
VizieR	210.941943	+54.446804	14034606+5426484	14.544	0.029	14.190	0.041	14.296	0.073	AAA	222	111	000	0 0

Solutions – Q2

Cone Search

File Columns Registry Interop Help

Available Cone Services

Registry: http://registry.astrogrid.org/astrogrid-registry/services/RegistryQueryv1_0

Keywords: **And**

Match Fields: Short Name Title Subjects ID Publisher Description

Accept Resource Lists **Cancel Query** **Submit Query**

Short Name	Title	Cluster
ABELLZCAT	Abell Clusters Measured Redshifts Catalog	Cluster
Abell	Abell Clusters	Cluster
J/A+A/258/243	HRV of Abell 151 galaxies (Proust+, 1992)	Clusters
J/A+A/278/379	X-ray Emission from Abell Clusters of Galaxies (Briel+ 1993)	Clusters
J/A+A/363/440	BR photometry of Abell 2104 (Liang+, 2000)	Clusters
J/A+A/377/428	Abell 970 galaxies radial velocities (Sodre+, 2001)	Clusters
J/A+A/382/60	BVR photometry in Abell 1689 (Duc+, 2002)	Clusters
J/A+A/384/383	H(alpha) galaxies in Abell 1367 and Coma (Iglesias-Paramo+, 2002)	Photom
J/A+A/392/420	Catalogue of galaxies towards Abell 498 (Durret+, 2002)	Clusters

AccessURL Description Version

<http://heasarc.gsfc.nasa.gov/cgi-...>

Cone Parameters

Cone URL: <http://heasarc.gsfc.nasa.gov/cgi-bin/vo/cone/coneGet.pl?table=abell&>

Object Name: **Resolve**

RA: degrees (J2000) Accept Sky Positions

Dec: degrees (J2000)

Radius: degrees

OK

TOPCAT(1): Table Columns

File Columns Display Help

Table Columns for 1: Abell-180d

	Visible	Name	\$ID	Class	Units	Description
0	<input type="checkbox"/>	Index	\$0	Long		Table row index
1	<input checked="" type="checkbox"/>	name	\$1	String		Abell Catalog Number (s = Supplemental Cluster Catalog)
2	<input checked="" type="checkbox"/>	ra	\$2	Float	degree	Right Ascension (hh mm.m)
3	<input checked="" type="checkbox"/>	dec	\$3	Float	degree	Declination (dd mm)
4	<input checked="" type="checkbox"/>	_count	\$4	Integer		Number of Cluster Members
5	<input checked="" type="checkbox"/>	bmtime	\$5	String		Bautz-Morgan Type, :=mean of obs, ?=quest
6	<input checked="" type="checkbox"/>	redshift	\$6	Float		Redshift
7	<input checked="" type="checkbox"/>	rich	\$7	String		Abell Richness Class (15-1850)
8	<input checked="" type="checkbox"/>	dist	\$8	String		Abell Distance Class (1-10)
9	<input checked="" type="checkbox"/>	vmag	\$9	Float		V Magnitude for 1
10	<input type="checkbox"/>	Search Offset	\$10	Double		
11	<input checked="" type="checkbox"/>	GAL_LONG	\$11	Double	degrees	IAU 1958 Galactic Longitude
12	<input checked="" type="checkbox"/>	GAL_LAT	\$12	Double	degrees	IAU 1958 Galactic Latitude

Define Row Subset

File Help

Subset Name:

Expression:

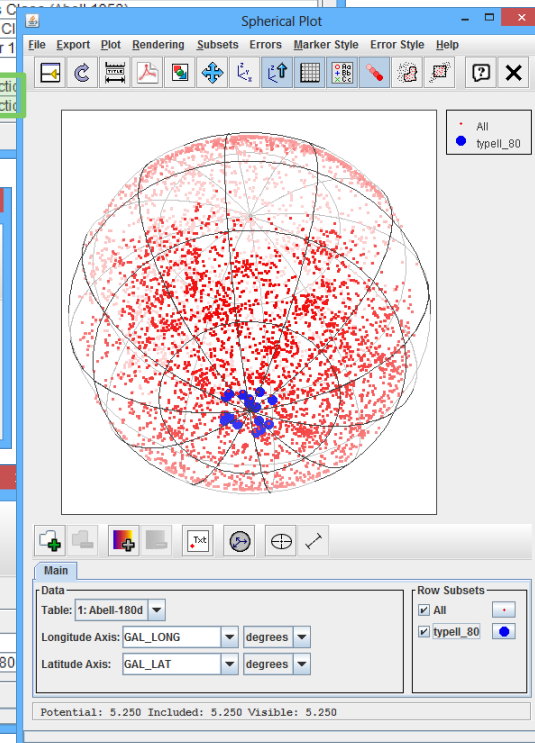
OK **Cancel**

TOPCAT(1): Row Subsets

File Subsets Display Interop Help

Row Subsets for 1: Abell-180d

ID	Name	Size	Fraction	Expression
_1	All	5250	100%	
_2	typell_80	18	0%	equals(bmtime, 'II') && GAL_LAT < -80



Solutions – Q3

Table Access Protocol (TAP) Query

File Deletion Columns Registry Interop Help

Select Service Enter Query Resume Job Running Jobs

Table Metadata
Service: <http://dc.g-vo.org/tap> (118 tables)
Table: rr.resource The resources ...

Columns:

Name	Data Type	Indexed	Unit	Description
ivoid	char	<input checked="" type="checkbox"/>		Unambiguous reference to the resource conform
res_type	char	<input type="checkbox"/>		Resource type (something like vs: datacollection
created	char	<input type="checkbox"/>		The UTC date and time this resource metadata
short_name	char	<input type="checkbox"/>		A short name or abbreviation given to something
res_title	unicodeChar	<input checked="" type="checkbox"/>		The full name given to the resource
updated	char	<input type="checkbox"/>		The UTC date this resource metadata descripi
content_level	char	<input type="checkbox"/>		Description of the content level or intended audi
res_description	unicodeChar	<input checked="" type="checkbox"/>		An account of the nature of the resource.
reference_url	char	<input checked="" type="checkbox"/>		URL pointing to a human-readable document de
creator_seq	unicodeChar	<input checked="" type="checkbox"/>		The creator(s) of the resource in the order given
content_type	char	<input type="checkbox"/>		Nature or genre of the content of the resource

Foreign Keys:

Target Table	Links	Description	Utype
--------------	-------	-------------	-------

Service Capabilities

Query Language: ADQL-2.0 Max Rows: 2000 (default) Uploads: 20Mb

ADQL Text

Synchronous Examples Clear Parse Errors

```
SELECT
  ivoid, res_title
FROM
  rr.resource
WHERE
  1=ivo_hasword(res_title, 'quasar')
```

OK

A

```
SELECT
  ivoid, res_title
FROM
  rr.resource
WHERE
  1=ivo_hasword(res_title, 'quasar')
```

B

```
SELECT
  ivoid, res_title, access_url, cap_type
FROM
  rr.resource
NATURAL JOIN rr.interface
NATURAL JOIN rr.capability
WHERE
  1=ivo_hasword(res_title, 'quasar')
AND 1=ivo_hasword(res_title, 'Magellanic')
AND cap_type = 'cs:conesearch'
```

TOPCAT(3): Table Browser

File Subsets Help

Table Browser for 3: TAP_2_rr.resource,rr.interface,rr.capability

	ivoid	res_title	access_url	cap_type
1	ivo://cds.vizier/japj/746/27	Magellanic Quasars Survey. II. AGNs behind LMC (Ko...	http://vizier.u-strasbg.fr/viz-bin/votable/-A?-source=J/ApJ/746/27&	cs:conesearch
2	ivo://cds.vizier/japis/194/22	Magellanic Quasars Survey. OSOs behind SMC (Kozl...	http://vizier.u-strasbg.fr/viz-bin/votable/-A?-source=J/ApJ/194/22&	cs:conesearch
3	ivo://cds.vizier/ja+a/549/a29	Quasars behind the Magellanic system (Cioni+, 2013)	http://vizier.u-strasbg.fr/viz-bin/votable/-A?-source=JJA+A/549/A29&	cs:conesearch