DSTANA, SKELANA, STANDARD COMMONs

How to write your physics analysis program ?

Just one suggestion:

BE STANDARD !

DSTANA

- After the DST is done, some “standard” data analysis (particle identification, K^0 finding…) leads to the (X)SHORT/LONG DST
- DSTANA stands for DST ANAlysis. It is a library including the code used for the (X)SHORT/LONG DST production plus code you need to perform your analysis

- Fit of secondary vertices (K^0, Λ…) and reconstruction of secondary interactions
- Charged particle identification (RICH, dE/dX; e and μ identification)
- Calorimetry, energy flow, reassociation of calorimetric clusters
- b tagging
- Utility routines
  - jet finding and 4-vector manipulation
  - tools for b physics
  - (…)
  - some that should never be used (like track deassociation and refit)

SKELANA

- SKELANA is a skeleton of the standard program to perform physics analysis. It is a layer on top of PHDST which standardizes the access to the data.
- Independent of running on DST or on (X)SHORT or LONG DST, it provides access to the same information in the same form (COMMON blocks).
- SKELANA runs in a simple way the parts of the DSTANA software you require - no need to study implementation details of DSTANA!
- The interface between the user and SKELANA is done through flags asking SKELANA to provide a given kind of information.
- **This information fills the STANDARD COMMONs**

THE STANDARD COMMONS

- Event COMMONs

  (general event information, flags, b-tag...)
- Track COMMONs
  - Vertex information
  - VECP
  - Track fit parameters(covariance matrices)
  - Simulated tracks, if Monte Carlo
  - Correspondence tables with the “truth” from simulation

- Particle identification

  (dE/dX, RICH, e-ID, μ-ID, V0, π^0, photons…)
- Service information

  (Run quality, beam spot)

FOR DETAILS, SEE THE

SKELANA MANUAL

EXAMPLE OF AN ANALYSIS

CHARGED PARTICLE MULTIPLICITY IN Z -> bb EVENTS

- Choose your data sample (interacting with your supervisor and with the relevant team convenor). Get the standard definition of “good events” and “good tracks” for your analysis.
- Offer a beer to somebody who has a working script using SKELANA; copy his/her script in your directory; check that it corresponds to what you learned about scripts in the Computing Tutorials.
- Write your program (see next transparency); run it on data and on simulation; compare data and simulation.
- Discuss all this with your supervisor, then present it to a team meeting. You’ll get a few comments: implement them in your code and re-run.
- Write the results into a paper; prepare a few transparencies on this, your luggage (don’t forget your swimming suit), and wait to be asked to present into a conference in Copacabana (or Timisoara).

EXAMPLE PROGRAM: THE CODE

```
 SUBROUTINE USER00 ! At initialization
+CDE, PSCFLG.  Common with SKELANA flags
  CALL PSINI     ! Initialise SKELANA
  IFLBTG = 2     ! Run b-tag & fill commons
  (all other flags: see the doc)
  CALL INITIALIZE_HISTOGRAMS
  END
  SUBROUTINE USER01(NEED)  ! Once per event
+CDE, PSCBTG. Standard b-tag common
  LOGICAL GOODY
  ...
  CALL PSBEG     ! Fill Standard common
  CALL GOOD_EVENT (GOODY) ! Event
   selection
  IF (GOODY .AND. QBTRP(3).LT.0.01) NEED=1
   ! Keep the    event since it's a good
   one according to the team and probably
   a bb
  ...
  END
```

```
 SUBROUTINE USER02 ! Analysis routine
+CDE, PSCVEC. Common with VECP
+CDE, PSCTRA. Common with tracking info
  (declaration and initialization)
  DO I = 1, NTRAC
    IF (GOOD_TRACK) NPART = NPART + 1
    (other variables)
  ENDDO
  CALL FILL_HISTOGRAMS (NPART,etc.)
  END
  SUBROUTINE USER99 ! End of program
  CALL OUTPUT_HISTOGRAMS
  END
```

A more complicated example in

$DELPHI_PAM/skelexa.car

$DELPHI_PAM/skelexa.cra

DOCUMENTATION
WHAT TO DO IF I GET CRAP ?

Manuals on paper

http://-*.cern.ch/~pubxx/tasks/doc/dstana/manual/

http://wwwinfo.cern.ch/~spassoff/skelana.html *(SKELANA, SKELEXA)*

LIGHT prototype (see Dante Borillo).

http://www.cern.ch/LIGHT/delight/

(Swim through DSTANA and the Standard COMMONs)

Info on packages, responsibles

http://wwwinfo.cern.ch/~offline/tasks.html

If something does not make sense...

According to the kind of problem: talk/mail to supervisor, team convenor, responsible of the DSTANA package, delphi core...

In case of desperation (but don't abuse)

Tzanko Spassoff, the living manual

Alessandro De Angelis (I can try to make you smile)