DEPARTMENT OF PHYSICS & ASTRONOMY
PHAS3459 EXAM-1
14:00 - 17:00 : November 10th 2014

Please read the exam guidelines, rules, instructions and marking criteria at `https://moodle.ucl.ac.uk/mod/wiki/view.php?pageid=15234` (linked from the *Examinations and coursework* page).

This exam is worth 25% of your final mark for the course and is made up of two parts:

- 15 multiple-choice questions, worth 7.5% of your final mark;
- a programming exercise, worth 17.5% of your final mark.

The multiple-choice questions are given as a Moodle quiz.

The Java source code of your solution to the programming exercise should be uploaded using Moodle. Each class should be uploaded as a separate file. Your classes should be created in a package called ”exam1”. You must upload *all* your classes used in your solution, including any you have copied or imported from earlier coursework modules.

DEPARTMENT OF PHYSICS & ASTRONOMY
PHAS3459 EXAM-1
PROGRAMMING EXERCISE

You will write Java classes and methods to read data from a URL, analyse the data and present the results.

Background

An *exoplanet* is a planet that orbits a star other than the Sun. Before 1992 there was no direct evidence for the existence of any planets outside our solar system, but advances in astronomical technology and analysis have led to the discovery of many exoplanets since then.

In this exercise, you will analyse some selected data from the Exoplanet Orbit Database[1].

File format

The data you will use is at the URL http://www.hep.ucl.ac.uk/undergrad/3459/exam-data/exoplanets.txt.

The first line is a header line, containing the name of each field in the data. Each of the remaining lines contains the following details of one exoplanet, separated by commas:

- name
- year of discovery
- method used to discover this exoplanet
- mass of exoplanet (in units of Jupiter masses)
- the separation of the exoplanet from its star (in astronomical units, a.u.)
- the distance of the star from Earth (in parsecs) where known

The last field (distance from Earth) is missing in some entries.

Tasks

You should write a program using appropriate classes and methods to read the data from the URL given above, store the data in suitable collection objects, and carry out the following tasks.

- Print details of the exoplanet that is closest to the Earth. You should not consider exoplanets where the distance is not given.
- For each of the methods of discovery that is listed in the file, print:
  - the number of exoplanets discovered using that method;
  - the earliest year that an exoplanet was discovered using that method;
  - full details of the lightest exoplanet discovered using that method.

END OF PAPER

[1] http://exoplanets.org/