REUSABLE SOFTWARE COMPONENTS

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http://alpha.fdu.edu/~levine/reuse_course/columns

This column consists of our yearly listing of sources for reusable software components. As always, no recommendation or guarantee by this column is implied.

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Act Europe

Act Europe supports Libre (free) Software. See GNU listed on a following pages Its tools support Ada95 and C, with most of these tools written in Ada95. Its components include:
Ada mode for Emacs
Ada Web Server
AUnit (unit testing)
GDB (Ada95 debugger)
Glade (Ada 95 distributed annex)
GNAT (Ada 95 compiler
GNOME/Ada
GPS (GNAT Programming System IDE)
GtkAda (GUI Development)
PolyORB
XML/Ada

Contact: http://libre.act-europe.fr
libre@act-europe.fr
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Ada Basis WWW Server

Ada Basis WWW Server is a repository of about 560Mbyte of public domain source code and documents mainly taken from the Public Ada Library, although still expanding. The software has been classified and is presented in a hierarchical manner separated in different application domains, with a multi-faceted searching facility in some domains.
          AdaBasis - an acronym for the German phrase "Bibliothek anwendungsbezogener Ada Software-Komponenten in Stuttgart" - is a repository of (mostly) free Ada Software, presented in a way that is (hopefully) easy to use and allows flexible access and effective searching.
          The archive is organized into different domains, including:

Artificial Intelligence	Compilers
Database Management	Documents
Text-Processing	Interfaces/Bindings
Mathematical Functions and Data Structures	Networking and Distributed Processing
Software Development Tools	

CONTACT: adabasis@informatik.uni-stuttgart.de
http://www.informatik.uni-stuttgart.de/ifi/ps/ada-software/ada-software.html
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The Ada-Belgium Archive

One of the aims of the Ada-Belgium organization is to disseminate Ada-related information. So, in addition to the organization of seminars, workshops, etc., and the management of two mailing lists, it also has set up an Ada archive primarily for people and companies in Belgium. This enables everyone interested to consult and download a large variety of Ada software and documents using an ftp server in Belgium or elsewhere.

Key items:
* A disk copy of the latest version of the Ada and Software Engineering Library (ASE2, a 2 disk CD-ROM set).
> ftp://ftp.cs.kuleuven.ac.be/pub/Ada-Belgium/cdrom/index.html
* A directory with Free Ada Software provided by Belgian Ada users.
> http://www.cs.kuleuven.ac.be/~dirk/ada-belgium/software/

The Ada-Belgium archive is primarily intended for the Belgian Ada community, but anyone interested is welcome to use it.

http://www.cs.kuleuven.ac.be/~dirk/ada-belgium
http://www.cs.kuleuven.ac.be/~dirk/ada-belgium/archive.html
FTP: ftp://ftp.cs.kuleuven.ac.be/pub/Ada-Belgium

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Ada in Action

Ada in Action (with Practical Programming Examples) by Do-While Jones is now on the Internet. Thanks to the work of Chris Morgan, and the generosity of Dirk Craeynest and Ada-Belgium, Ada in Action is now on the web at
http://www.cs.kuleuven.ac.be/~dirk/ada-belgium/aia/contents.html

The first edition of Ada in Action was published by John Wiley & Sons, Inc. in 1989. Initial sales were not sufficient to retain John Wiley's interest in it, and it went out of print after only 1500 copies were sold. It then became a cult classic, with a very small :-(but very loyal :-) following. There is said to be an unauthorized Chinese translation, and there have been reports that the asking price in Germany is double the cover price. If you have a copy of the first edition, take good care of it.

The only new material in the second edition is contained in the dedication, copyright notice, and the Epilog (Chapter 7). The new copyright notice is much less restrictive than the previous one. The Epilog contains reflections on the first edition.

Ada in Action demonstrates the skills and techniques that make programmers more productive, progressing from simple to more complex examples.

Ada in Action includes:
- Utilities that express floating-point values in fixed-or floating-point notation, and convert free-form character input to floating-point values.
- Three portable user interfaces that give the application program complete cursor control, permit line editing and default responses, and support "help" messages.
- Three file utility programs (MORE, WRITE, and LINE) that demonstrate file I/O and user interface techniques.

CONTACT: Do-While Jones
> do_while@ridgecrest.ca.us

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ACES

The Ada Compiler Evaluation System (ACES) Version 2.1 is a collection of performance tests, test management tools, analysis tools, and assessment procedures that permit users to collect and analyze data on performance and usability characteristics of Ada implementations.

Originally funded by the AJPO, the ACES is a merger of the Ada Compiler Evaluation Capability (ACEC) and the Ada Evaluation System (AES). Version 2.1 of the ACES includes over 100 tests for language features introduced by Ada95. Other improvements include the provision of default processing choices, selection of tests by performance issue, a set of default analysis reports, and a facility for the easy inclusion of user-defined benchmarks in the ACES test selection and analysis processes.

ACES information is available on the Internet at:
http://www.adaic.org/compilers/aces/aces-intro.html

This document contains overview information as well as instructions for obtaining the ACES files.
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Ada IC

The Ada Information Clearinghouse has been providing free information about Ada and software engineering for over fifteen years. Sponsored by the Ada Resource Assoc. (http://www.adaresource.com) a consortium of Ada tool vendors and developers, the AdaIC maintains close contact with the Ada community in order to obtain the latest information on a variety of topics. Visit their website, http://www.adaic.org, to see the latest in news, implementation guidelines, compilers and tools, reusable Ada code, education and training, Ada successes, and lessons learned by software developers.

The Ada-wide search engine indexes all known Ada content (more than 38,000 pages at last count). General search engines, such as Google, have too many references to the term "Ada" to make them practical for the purposes of the Ada community.

Please send any news you have on Ada to the Editorial Webmaster <webmaster@adaic.org>. The Ada News of the AdaIC sometimes transmits press releases about the programming language to about 500 technical journalists and editors, as well as citing it on the AdaIC Website, as a free service to its users.

A comprehensive collection of Ada articles, reports, textbooks, videos, and CD-ROMS is available for browsing on-line through the AdaIC website. Users may access older components at the Virtual Library (http://archive.adaic.com).
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AJPO

The Ada Joint Project Office was closed on October 1998. For information on the AJPO see
http://sw-eng.falls-church.va.us/ajpofaq.html

To obtain components previously available from PAL see
http://www.iste.uni-stuttgart.de/ps/AdaBasis/pal_1195/ada/ajpo/
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Adalog

Adalog offers Ada utilities, Ada components, and Adapplets. These can be freely used and modified for any purpose, under the GMGPL license. Functions include Protection, Debugging, and OS_Services, among others.

The site also contains Adasubst/Adadep programs which are useful utilities for rearranging Ada programs. These programs are built on top of ASIS and include valuable packages providing higher level queries for ASIS. Look for the function called "Full_Name_Image," which returns the unique name of any Identifier.

SEE: http://www.adalog.fr   http://www.adalog.fr/compo2.htm
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AdaPower

AdaPower.com is a repository of information, links to resources, source code examples and packages for reuse. AdaPower.com can be divided into the following sections:

Articles and Links
> Articles and Links to Ada Related Topics, Ada learning materials, and people in the Ada on-line community

The Ada Source Code Treasury
> Source code examples of using Ada and Ada related bindings and tools for both beginner and advanced students of Ada

Packages for Reuse
> An extensive repository of categorically arranged packages for download and links to packages available for reuse on the internet

Ada Projects and AdaPower.net
> Listings and hosting for Active Ada projects on the net

AdaPower.com has been completely rebuilt and is now database oriented, allowing for searches of the entire contents.

For information on GNAVI, a GNU Ada Visual Interface, see GNAVI below.

Please contact David Botton at David@Botton.com with articles, links or package submissions, or for information on hosting your project on AdaPower.net see:
> http://www.adapower.com/

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ASE2

The ASE2 Library is an organization of software and other resources (freeware and shareware) on topics related to both Ada and Software Engineering, and there are several special-interest sections, such as sections on Microsoft Technologies, best practices, the Software Engineering Institute Capability Maturity Models, and website links. It is a resource for the practicing software engineer (regardless of implementation language) and the practicing Ada developer:

For the Practicing Software Engineer:
The "Software Engineer's Bookshelf"
Best practices in Software Engineering
Index of useful web sites (with 17,000+ hyperlinks to them)
Systems Engineering Capability Maturity Model (SEI)
Systems Engineering Capability Model (EIA/IS 731)
Systems Security Engineering Capability Maturity Model
Software Capability Maturity Model
Software Acquisition Capability Maturity Model
People Capability Maturity Model
Jim Gray's Turing Lecture - A Dozen Information Technology Research Goals
Documents and tutorials on topics in Software Engineering, including Domain Engineering, Reuse
Object-Oriented Analysis and Design,
Object-Oriented Programming, Software Development
Methodologies (Waterfall, Spiral, Rapid Application
Development), Formal Methods, Cleanroom,
Complexity Analysis, Metrics, Capability
Maturity, Six Sigma, Personal Software Process,

Team Software Process (including, new courseware on systems engineering, life cycles, requirements engineering, configuration management, risk management, reviews, and several other topics)

General-purpose tools (such as GRASP - Graphical Representation of Algorithms, Structures, and Processes - for Ada, C, C++, Java, and VHDL from Auburn University with funding from ARPA, NASA and NSF)

For the Practicing Ada Developer:

The "Ada User's Bookshelf" - 100M+ bytes of hypertext documents, tutorials, and references on Ada, reuse, real-time software intensive systems and software engineering

Freeware Ada95 compilers and development environments for a variety of platforms, including Windows 95/98/NT and UNIX (such as GNAT Ada95 and C environment from Ada Core Technologies)

Freeware Software components and tools - RAPID, AdaGIDE, SCATC DSK, GWRL, and the Booch components

Ada Semantic Interface Specification (ASIS)

Support for Ada95 education, including tutorials and freeware tools (such as AdaGIDE from the United States Air Force Academy)

Ada Advocacy material - why Ada is the preferred language for Software Engineering

JGRASP, a GUI developed by Auburn University (http://eng.auburn.com/grasp)

The Ada and Software Engineering Library Version 2 is online at:

 http://unicoi.kennesaw.edu/ase

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Booch Components

The Ada 95 Booch Components began in late 1994 when David Weller began a port of Grady Booch's C++ components to Ada95. They have since been taken over by Simon Wright and, at this time, include implementations of :

```
        Bags             : UBDN
        Collections      : UBDN
            (ordered)    : UBDN
        Dequeues         : UBDN
        Graphs  Directed : U
                Undirected : U
        Lists    Single    : U
                 Double    : U
        Maps             : UBDN
        Queues           : UBDN
            (ordered)    : UBDN
        Rings            : UBDN
        Sets             : UBDN
        Stacks           : UBDN
        Trees    AVL     : U
                 Binary    : U
                 Multiway : U
```

U=Unbounded, B=Bounded, D=Dynamic, and N= Unmanaged refer to the storage allocation mechanisms available for the component. U and D use user-supplied storage pools, B doesn't use dynamic allocation at all, and N uses the default pool. Filtering and sorting operations are supported.

See: http://www.pushface.org/components/bc

CONTACT: Simon Wright
simon@pushface.org
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Charles

Charles is a container library for Ada95, modeled closely on the C++ STL. Sequence containers (vectors, deques, and lists) store unordered elements, inserted at specified positions. Associative containers (sets and maps) order elements according to a key associated with each element; both sorted (tree-based) and hashed containers are provided. A separate iterator type associated with each container is used to visit container items and to effect direct modification of elements. Charles is flexible and efficient, and its design has been guided by the philosophy that a library should stay out of the programmer's way.

The web site is here: http://charles.tigris.org

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COSMIC

Open Channel Software has entered into an agreement with the National Technology Transfer Center (NTTC) to publish the COSMIC software collection. This collection represents software created by NASA in a wide range of disciplines including engineering, chemistry, aerodynamics, and other areas. In previous years, we featured COSMIC software when it was supported by the University of Georgia Research Foundation.

Many of the COSMIC programs are available for "adoption." When you adopt an orphaned application at Open Channel, you agree to moderate user contributions to the application. You also take over the maintenance of the site for the application through a Content Management system.

http://www.openchannelfoundation.org/cosmic/
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DACS

The Data & Analysis Center for Software (DACS) is a Department of Defense (DOD) Information Analysis Center (IAC). The DACS is the DOD Software Information Clearinghouse serving as an authoritative source for state of the art software information and provides technical support to the software community.   Many of the links are outdated.

DACS: http://www.dacs.dtic.mil/
reuse: http://www.dacs.dtic.mil/databases/url/key.hts?keycode=15
Ada: http://www.dacs.dtic.mil/databases/url/key.hts?keycode=238:249&islowerlevel=1

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DATA FUSION LABORATORY

The Data Fusion Laboratory at Drexel University has made a release of its Ada 95 Matrix Math package available to the Ada 95 community. This package targets vector and matrix math operations implemented natively in Ada 95. Many operations, such as determinants, subvectors/matrices, singular value decompositions, inverses, eigenvalues/eigenvectors are supported.

Please refer to the Data Fusion Lab's web page at: http://dflwww.ece.drexel.edu/

The matrix package is under Research, entitled "Ada95 Matrix Package."
   http://dflwww.ece.drexel.edu/research/ada/
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GNAVI.org

The GNU Ada Visual Interface - The Open Source answer to Delphi and Visual Basic

GNAVI is an active project to construct an Open Source Rapid Application Development Environment similar to Delphi using Ada. Currently the following are available:

- GNATCOM - Ada bindings to COM/DCOM/ActiveX for Win32 (stable) GWindows Win32 - Windows binding and framework (stable) GWindows OSX - in early Alpha, OS X binding and framework (pre-alpha)
- GWindows GTK for Unix and Linux and GNAVI IDE - the GUI Application builder and RAD Environment are being developed.

For more information see http://www.gnavi.org and join the gnavi-list@gnavi.org
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GNU

The Free Software Foundation is dedicated to eliminating restrictions on people's right to use, copy, modify, and redistribute computer programs. It promotes the development and use of free software and its documentation in all areas using computers. Specifically, it is maintaining a complete, integrated software system named "GNU". ("GNU" is pronounced "guh-new" and stands for "GNU's Not Unix".)

The word "free" in "Free Software Foundation" refers to freedom, not price. You may or may not pay money to get GNU software, but regardless you have two specific freedoms once you get it: first, the freedom to copy a program and give it away to your friends and co-workers; and second, the freedom to change a program as you wish, by having full access to source code. You can study the source and learn how such programs are written. You may then be able to port it, improve it, and share your changes with others. If you redistribute GNU software you may charge a distribution fee or give it away.

What is Copyleft?

The simplest way to make a program free is to put it in the public domain, uncopyrighted. But this permits proprietary modifications, denying others the freedom to use and freely redistribute improvements; it is contrary to the intent of increasing the total amount of free software. To prevent this, copyleft uses copyrights in a novel manner. Typically copyrights take away freedoms; copyleft preserves them. It is a legal instrument that requires those who pass on programs to include the rights to use, modify, and redistribute the code; the code and rights become legally inseparable.

The copyleft used by the GNU Project is made from the combination of a regular copyright notice and the "GNU General Public License." GPL is a copying license which basically says that you have the aforementioned freedoms. An alternate form, the "GNU Lesser General Public License" applies particularly to certain GNU libraries. This license permits linking the libraries into proprietary executables under certain conditions. The appropriate license is included in all GNU source code distributions and many manuals.

There are several GNU-associated Ada projects, located at http://www.gnuada.org

- The Ada for GNU/Linux Team (ALT)
- The Ada for SCO page.
- The Ada for NetBSDpage.

The GNU NYU Ada95 Translator (GNAT) Project can be obtained from http://www.gnat.com

Free Software Foundation, Inc.	+1 617 542 5942 x 23
59 Temple Place, Suite 330	+1 617 542 2652 (fax)
Boston, MA 02111-1307 USA	email: info@fsf.org
See: http://member.fsf.org	http://www.gnu.org

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Leake components

Stephen Leake maintains the following Ada components:
>   com ports: An Ada binding, based on Win32Ada, to the Win32 com port facilities.
>   Stephe's Ada Library: another entry in the Standard Ada Library sweepstakes
>   Auto_Text_IO: automatically generates Text_IO packages for Ada packages

http://www.toadmail.com/~ada_wizard
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PragmAda Software Engineering

PragmAda Software Engineering is a library of over 50 of the world's finest quality components as free, open-source software available under the GNAT-modified GPL. The components are available at
>   http://home.earthlink.net/~jrcarter010/pragmarc.htm

PragmAda Software Engineering will provide support for the library at very low prices.

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CONTACT:       911 South Cedar Drive
               Apache Junction, AZ  85220-8440
               (480) 983-5634
               pragmada@earthlink.net
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SIGAda

Be sure to check the web pages of SIGAda at
  http://www.acm.org/sigs/sigada/

In particular, see SIGAda's links to different software repositories.
http://www.acm.org/sigs/sigada/resources/links.html
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Swiss Federal Institute of Technology

The Software Engineering Laboratory (LGL) at the Swiss Federal Institute of Technology at Lausanne (EPFL) maintains pointers to Ada Resources: These include:
  The Ada 95 Reference Manual
  LGL Ada Component Library
  GLADE Filter Add-Ons
  Ada 95 Pretty Printer based on ASIS
  GNAT User's Guide

See: http://lgl.epfl.ch/ada/index.html
      http://lgl.epfl.ch/index.html

Also see Ada In Switzerland, http://www.white-elephant.ch/ada/, the web site of the interest group of the Swiss Informatics Society (SI)
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USAFA

The US Air Force Academy maintains an Ada software repository. USAFA mostly distributes Ada tools (such as AdaGIDE and RAPID). More information on RAPID is in Ada Letters (proceedings of SIGAda '99). The GUI libraries are an example of reusable code. In addition, the USAFA repository includes the following software:

Parallel : A binding to use the parallel port under Windows 95/98.
Serial : A binding to use the serial port under Windows 95/98/NT.
Mcc-Sounds : A binding to play .WAV files under Windows 95/98/NT.
An elementary graphical replacement for Ada.Text_IO.
AdaGOOP: An automatic object-oriented parser generator
Adagraph : a modified version of Jerry van Dijk's Adagraph
Fortran to Ada Translator donated by Oliver Kellogg (DaimlerChrysler Aerospace, Ulm Germany),
    implemented as a perl script

AdaGide, a leading open-source IDE for Ada under Windows, now includes A#, an Ada compiler for the Microsoft .NET platform.

See: http://www.usafa.af.mil/dfcs/bios/mcc_html/ada_stuff.html
    ftp://ftp.usafa.af.mil/pub/dfcs/carlisle/usafa/graph110/index.html

CONTACT: Martin C. Carlisle,
             Assoc. Prof of Computer Science
             US Air Force Academy
             Martin.Carlisle@usafa.af.mil
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Mats Weber's Component Library

The components in this library fall into four main categories. The most useful may be the data structures, which were written to be as versatile as possible.

- Data Structures (Bags, Tables, Queues, Stacks, Lists, etc.)
- Math (ZpZ_Field, Polynomials, Permutations, Linear_Programming, etc.)
- Ada Programming Tools (Makeup_Ada_File, Ada_Lexical_Analyzer, etc.)
- OS Interface (CPU, VMS_File_Names, etc.)

These components are for Ada 95 and generally will not compile with Ada 83, but if you need to use them in an Ada 83 environment, almost all you will have to do is remove the (<>) in generic formal types where appropriate.

CONTACT:
http://mats.weber.org/ada/mw_components.html
mats@weber.org
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