

YP Collisions 1.0

Simulation of 2-D collisions.

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Author: Yves Pelletier
Email: pelletier@kagi.com
or ch865@freenet.carleton.ca
WWW: <http://www.kagi.com/pelletier>

Price (Shareware): \$15 US

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Program description:

YP Collisions simulates a two-dimensional collision between two particles. The user chooses the mass, the initial velocity (magnitude and direction), and the coefficient of restitution. An animation shows the motions of the particles before and after the collision, and the following information is displayed: final velocity of each particle, impulse of each particle, momentum (initial and final), percentage of conserved momentum, kinetic energy, percentage of conserved energy. It is also possible to view the force exerted on each particle during the collision.

Required Hardware and Software: **YP Collisions** runs on any Macintosh computer with Mac OS 7.0 or later. It needs about 215 kb on your hard disk and 1,2 Mb of RAM. The software runs on older Macs with 68000 processors (Mac Plus, Mac Classic), but simulations are slower.

Getting Started:

When you launch **YP Collisions**, 2 windows are displayed on the screen: the animation window (in which the animated simulation will appear) and the Initial Conditions dialog. Select the "Start Animation" item in the "Animation" menu to start a simulation. Use the "Results..." item in the "Animation" menu to get information about the simulated collision (percentage of conserved energy, etc.). Other items from the "Animation" menu allow you to display the force exerted on the particles during the collision, and the direction of their motion. In addition to the text fields allowing you to choose the mass and initial velocity of each particle, the Initial Conditions dialog has a scroll bar which you can use to change the coefficient of restitution.

Coefficient of restitution:

The coefficient of restitution can vary from 0 to 1, with 1 equivalent to an elastic collision (energy conserved at 100%) and 0 equivalent to a completely inelastic collision (the two bodies stick together after the collision).

Using YP Collisions:

Note: To help you explore all menus of the program, you may use balloon help (with the "?" menu, in the top right corner of the screen).

Menus:

"Apple" Menu:

Use this menu to

- open an item from the Apple Menu Folder
- read information about **YP Collisions**
- consult online help
- unlock your copy of the program.

- **"About YP Collisions..."** item : When you select this item from the Apple menu, a dialog box showing information about the version number and copyright is displayed, as well as whether your copy of the software has been registered or not.

"Unlock" button: This button is visible only if your copy of the software has not been personalized. After receiving your personal unlocking code, click on this button to open another dialog box so that you may enter (or paste) your name and your unlocking code in the appropriate zones.

"Help & Info" Button: This button gives you access to online help.

"File" Menu:

Use the **"File Menu"** to

- save the contents of the active window as a PICT file,
- close the active window,
- print the active window,
- quit the application **YP Collisions**.

"Save as PICT..." item:

When you select this item from the **"File"** menu, trajectories that are displayed in the animation window are saved as a PICT file, which can be

open by any draw or paint program.

"Close Window" item:

When you select this item from the "File" menu, the program closes the active window.

"Page Setup..." item:

Use this item when you want to use a different paper size, or orientation.

"Print" item:

Use this item to print the content of the active window. You can print trajectories and graphs.

"Quit" item:

Use this item from the file menu to quit the program "YP Collisions".

"Edit" Menu:

The "Cut", "Paste" and "Delete" items are available only when a dialog box in which you may enter text is active.

The "Copy" item is also available when the animation window (or the results window) is active, so you can easily copy the picture in the clipboard.

"Animation" Menu:

Use this menu

- to start the animated simulation;

- to show or hide the trajectory of the particles in the animation;
- to show or hide the force exerted on the particles during the collision;
- to show or hide the arrows indicating the direction of motion;
- to activate or deactivate slow motion;
- to display the Initial Conditions dialog, if it had been closed;
- to display the Results window, if it had been closed.

"Initial Conditions..." item:

When you select this item from the "Animation" menu, a dialog is displayed in which you can type the mass and initial velocity (magnitude and direction) for each particle.

The numerical values may be written in scientific notation if desired (ex: +3.5E-4; the exact syntax depends on the settings of your operating system, in the "Numbers" control panel).

A scroll bar allows you to vary the coefficient of restitution from 0 to 1.

"Results..." Items:

When you select this item from the "Animation" menu, a window is displayed, in which you can find the following information:

For each particle: mass, initial velocity, final velocity, impulse.

For the whole system: momentum (initial and final), percentage of conserved momentum (always 100%), kinetic energy (initial and final), percentage of conserved kinetic energy.

"Help" Menu:

YP Collisions supports Balloon Help. Use this menu to show or hide help balloons, and to display online help.

Ordering information:

YP Collisions is shareware. The unregistered version of **YP Collisions** may be freely distributed to allow anybody to try it before registering. You are permitted to upload it to a BBS, distribute it on a CD-ROM, or give a copy to a friend.

If you want to use **YP Collisions** on a regular basis, you must pay for a user license. You will then receive an unlocking code that will permit you to personalize your copy of the program.

The unregistered version have the following limitations:

- the mention "This copy is for evaluation only." is permanently displayed in the main window.
- an item from the "Animation" menu is not available (the unavailable animation is chosen randomly at startup among the 3 following items: Show Force, Show Direction, Slow Motion).

- the number of animations is limited to 12 (if you want to produce more animations, you must quit and restart the program).

Your unlocked version will have the following advantages:

- the mention "This copy is for evaluation only." will never be displayed again in the main window.
- all items of the "Animation" menu will be available.
- there will be no limit to the number of animations.
- in addition, you will be able to unlock all future updates of **YP Collisions** with the same unlocking code.

Methods of Payment:

You can pay your license to one of those two companies: **Kagi** (located in the United States) and **ShareIt!** (located in Germany).

If you use **Kagi**, it is possible to pay by credit card (Visa, Master Card, American Express), by check or postal money order (in american dollars), with cash, or by "First Virtual". For more information about registering **YP Collisions** with **Kagi**, please read the file "**Registering with Kagi**".

If you choose **ShareIt!**, you can pay by credit card (Visa, Mastercard/Eurocard, American Express and Diner's Club), by bank transfer/wire, by check, by eurocheque, or cash. For more information about registering **YP Collisions** with **ShareIt!**, please read the file "**Registering with ShareIt!**".

Detailed Prices:

Single User License: A **\$15.00** US registration fee will license one copy of **YP Collisions** for use on any one computer at any one time. For example, one copy may be used by any number of people and may be freely moved from one computer to another as long as there is no possibility of it being used simultaneously on more than one machine.

Site License: A license covering all locations for your organization within a 160 kilometer radius of your site (100 miles), is available at the price of **\$200.00** US.

Technical Support:

If you have any comments or suggestions, please feel free to email me at

pelletier@kagi.com (or ch865@freenet.carleton.ca).

Other Physics Software From Yves Pelletier:

Ray Optics:

YP Image constructs ray diagrams explaining image formation by mirrors and thin lenses.

YP Reflection simulates the reflection of a laser ray on plane mirrors.

YP Refraction simulates the reflection of a laser ray in a prism.

Classical Mechanics:

YP Projectiles is a projectile motion simulator.

YP Circular is a uniform circular motion and simple harmonic motion simulator.

Mechanisms:

YP Slider Crank simulates the motion of a piston activated by a slider crank mechanism.

YP Planetary Gear is a planetary gear train simulator.

To download the latest versions: <http://www.kagi.com/pelletier>

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