

Fyzika v nematematických předmětech - zeměpis, dějepis, sociologie - nové možnosti z Mathematica 10

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Mathematica a Wolfram Alpha

Řešení s postupem



solve $x+y=1$, $x-y=2$

Input interpretation: +

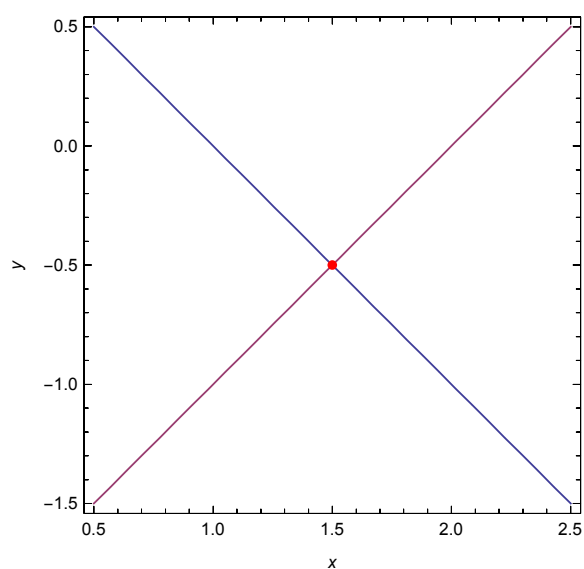
solve

$x + y = 1$

$x - y = 2$

Result: +[More digits](#)[Step-by-step solution](#)

$$x = \frac{3}{2} \approx 1.5000 \text{ and } y = -\frac{1}{2} \approx -0.50000$$

Implicit plot: + x_{\min} x_{\max} y_{\min} y_{\max} — $x + y = 1$ — $x - y = 2$ WolframAlpha +

HDP Čína



china gdp

Input interpretation: +

China

GDP

nominal

[Definitions](#)Result: +

\$9.24 trillion per year (world rank: 2nd) (2013 estimate)

Local currency conversion:

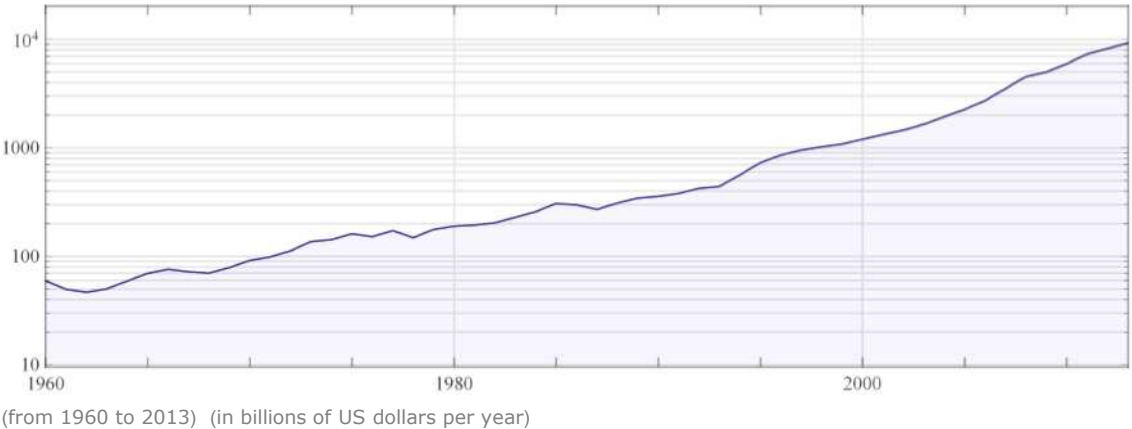
Kč199.6 trillion per year (Czech koruny per year) (at current quoted rate)

GDP history:

Linear scale

All years

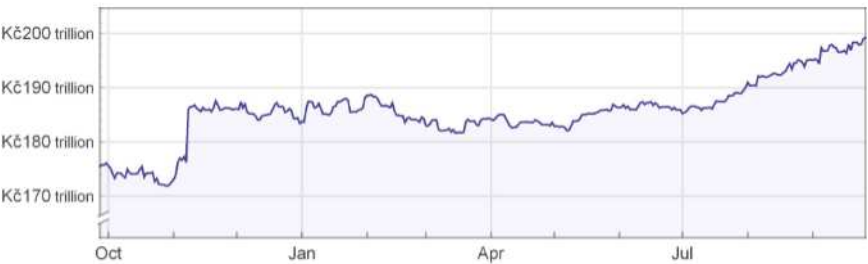
(log scale)



Exchange history for

\$9.24 trillion (US dollars):

Last year



1-year minimum	Kč171.8 trillion (29. 10. 2013 11 months ago)
1-year maximum	Kč199.3 trillion (26. 9. 2014 0 days ago)
1-year average	Kč185.6 trillion (annualized volatility: 6.8%)

Units

Economic properties:

GDP at exchange rate	\$9.24 trillion per year (world rank: 2 nd) (2013 estimate)
GDP at parity	\$16.16 trillion per year (world rank: 2 nd) (2013 estimate)
real GDP	\$4.864 trillion per year (price-adjusted to year-2000 US dollars) (world rank: 2 nd) (2013 estimate)
GDP in local currency	¥ 56.88 trillion per year (2013 estimate)
GDP per capita	\$6807 per year per person (world rank: 115 th) (2013 estimate)

GDP real growth	+7.671% per year (world rank: 24 th) (2013 estimate)
consumer price inflation	+2.63% per year (world rank: 100 th) (2013 estimate)
unemployment rate	4.5% (world rank: 155 th highest) (2012 estimate)

• Units

• Definitions

GDP components:

Show details +

final consumption expenditure	\$4.746 trillion per year (51.36%) (world rank: 3 rd)
gross capital formation	\$4.554 trillion per year (49.29%) (world rank: 1 st)
external balance on goods and services	\$236.8 billion per year (2.56%) (world rank: 1 st)
total GDP	\$9.24 trillion per year (100%) (world rank: 2 nd)

(2013 estimate)

• Definitions

Value added by sector:

Show manufacturing breakdown +

agriculture	\$925.2 billion per year (world rank: 1 st) (2013 estimate)
industry	\$4.056 trillion per year (world rank: 1 st) (2013 estimate)
manufacturing	\$2.331 trillion per year (world rank: 1 st) (2011 estimate)
services, etc.	\$4.259 trillion per year (world rank: 3 rd) (2013 estimate)

• Definitions

WolframAlpha +

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USA dluh



usa debt

Assuming “debt” is a US economic property | Use as **international data** instead

Input interpretation: +

United States

federal debt

quarterly

not seasonally adjusted

Latest result: +

\$17.63 trillion (US dollars) (Q2 2014)

Local currency conversion: +

Kč381 trillion (Czech koruny) (at current quoted rate)

Federal debt percent change: +

+0.2 percent per quarter year (Q2 2014)

Show history

Definitions

Federal debt year over year percent change: +

+5.3 %/yr (Q2 2014)

Show history

Definitions

Federal debt: +

Show charts

More

held by public	\$12.57 trillion (US dollars) (71%) (Q2 2014)
held by agencies and trusts	\$5.061 trillion (US dollars) (29%) (Q2 2014)
total federal debt	\$17.63 trillion (US dollars) (100%) (Q2 2014)

WolframAlpha +

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{ {2006, 1, 1, 0, 0, 0.}, $8.37116 \times 10^{12}}, { {2006, 4, 1, 0, 0, 0.}, $8.42004 \times 10^{12}},
{ {2006, 7, 1, 0, 0, 0.}, $8.50697 \times 10^{12}}, { {2006, 10, 1, 0, 0, 0.}, $8.68022 \times 10^{12}},
{ {2007, 1, 1, 0, 0, 0.}, $8.84967 \times 10^{12}}, { {2007, 4, 1, 0, 0, 0.}, $8.86768 \times 10^{12}},
{ {2007, 7, 1, 0, 0, 0.}, $9.00765 \times 10^{12}}, { {2007, 10, 1, 0, 0, 0.}, $9.22917 \times 10^{12}},
{ {2008, 1, 1, 0, 0, 0.}, $9.43759 \times 10^{12}}, { {2008, 4, 1, 0, 0, 0.}, $9.49201 \times 10^{12}},

```



```
{ {2008, 7, 1, 0, 0, 0.}, $1.00247 \times 10^{13}}, { {2008, 10, 1, 0, 0, 0.}, $1.06998 \times 10^{13}},
{ {2009, 1, 1, 0, 0, 0.}, $1.11269 \times 10^{13}}, { {2009, 4, 1, 0, 0, 0.}, $1.15453 \times 10^{13}},
{ {2009, 7, 1, 0, 0, 0.}, $1.19098 \times 10^{13}}, { {2009, 10, 1, 0, 0, 0.}, $1.23113 \times 10^{13}},
{ {2010, 1, 1, 0, 0, 0.}, $1.27731 \times 10^{13}}, { {2010, 4, 1, 0, 0, 0.}, $1.32018 \times 10^{13}},
{ {2010, 7, 1, 0, 0, 0.}, $1.35616 \times 10^{13}}, { {2010, 10, 1, 0, 0, 0.}, $1.40252 \times 10^{13}},
{ {2011, 1, 1, 0, 0, 0.}, $1.42701 \times 10^{13}}, { {2011, 4, 1, 0, 0, 0.}, $1.43431 \times 10^{13}},
{ {2011, 7, 1, 0, 0, 0.}, $1.47903 \times 10^{13}}, { {2011, 10, 1, 0, 0, 0.}, $1.52229 \times 10^{13}},
{ {2012, 1, 1, 0, 0, 0.}, $1.56065 \times 10^{13}}, { {2012, 4, 1, 0, 0, 0.}, $1.5855 \times 10^{13}},
{ {2012, 7, 1, 0, 0, 0.}, $1.60662 \times 10^{13}}, { {2012, 10, 1, 0, 0, 0.}, $1.64327 \times 10^{13}},
{ {2013, 1, 1, 0, 0, 0.}, $1.67714 \times 10^{13}}, { {2013, 4, 1, 0, 0, 0.}, $1.67383 \times 10^{13}},
{ {2013, 7, 1, 0, 0, 0.}, $1.67382 \times 10^{13}}, { {2013, 10, 1, 0, 0, 0.}, $1.7352 \times 10^{13}},
{ {2014, 1, 1, 0, 0, 0.}, $1.76012 \times 10^{13}}, { {2014, 4, 1, 0, 0, 0.}, $1.76326 \times 10^{13}} }
```

```
CountryData["UnitedStates", "GovernmentDebt"]
```

```
8.0589 \times 10^{12}
```

```
CountryData["UnitedStates", "ExternalDebt"]
```

```
$1.225 \times 10^{13}
```

Mathematica v zeměpisu

<http://www.wolframalpha.com/examples/PlacesAndGeography.html>

Jak daleko je...

 prague to ostrava

Assuming "prague" is a city | Use as **an astronomical observatory** instead

Assuming Prague (Czech Republic) | Use

Prague (Oklahoma, USA) or **Prague (Nebraska, USA)** instead

Input interpretation:

Prague, Hlavní město Praha to Ostrava, Moravskoslezsky

Distance:

Show non- metric units

276.9 km (kilometers)

Driving information:

Show non- metric units

Show directions

driving time

1 hour 5 minutes

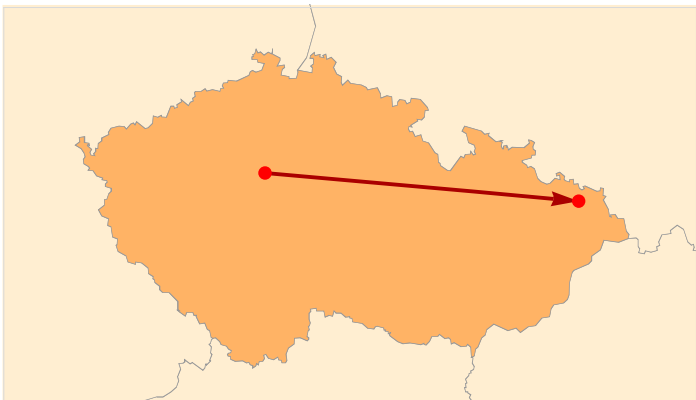
distance	94.34 km (kilometers)
route	via D1

Direct travel times:

More +

aircraft (550 mph)	20 minutes
sound	15 minutes
light in fiber	1 ms (millisecond)
light in vacuum	924 μ s (microseconds)

(assuming constant-speed great-circle path)

Map: +

Local map:

400 kilometers across ▾Non-metric +

Larger



(based on current OpenStreetMap data)

Current local times: +

Prague	8:56 am CEST Friday, September 26, 2014
--------	---

Ostrava

8:56 am CEST | Friday, September 26, 2014

Populations:

	Prague	Ostrava
city population	1.249 million people (country rank: 1 st) (2010)	313 088 people (country rank: 3 rd) (2004)
metro area population	1.406 million people (Prague metro area) (2007)	698 087 people (Ostrava metro area) (2007)

Geographic properties:

Show non- metric

	Prague	Ostrava
elevation	223 m	223 m

Units

WolframAlpha



prague to istanbul

Assuming “prague” is a city | Use as an astronomical observatory instead
Assuming “istanbul” is a city | Use as a body of water instead
Assuming Prague (Czech Republic) | Use
Prague (Oklahoma, USA) or Prague (Nebraska, USA) instead

Input interpretation:

Prague, Hlavní město Praha to Istanbul, Turkey

Distance:

1508 km (kilometers)

Show non- metric units

Driving information:

Show non- metric units

Show directions

driving time	18 hours 10 minutes
distance	1899 km (kilometers)

Direct travel times:

More

aircraft (550 mph)	1 hour 40 minutes
sound	1 hour 15 minutes
light in fiber	7 ms (milliseconds)
light in vacuum	5 ms (milliseconds)

(assuming constant-speed great-circle path)

Map:



Current local times:

Prague	8:56 am CEST Friday, September 26, 2014
Istanbul	9:56 am EEST Friday, September 26, 2014

Populations:

	Prague	Istanbul
city population	1.249 million people (country rank: 1 st) (2010)	13.3 million people (country rank: 1 st) (2011)
metro area population	1.406 million people (Prague metro area) (2007)	12.49 million people (Istanbul metro area) (2007)

Geographic properties:

Show non-metric

	Prague	Istanbul
elevation	223 m	94 m

Units

WolframAlpha

Počasí

<http://www.wolframalpha.com/examples/WeatherAndMeteorology.html>

global warming

Assuming “global warming” is referring to global climate studies
| Use as a music work or a word or a climatology topic instead

Input interpretation:

global climate studies

WolframAlpha 

pollution

Assuming “pollution” is international data | Use as a word instead

WolframAlpha 

Temperature prague 1970-2014

Assuming “prague” is a city | Use as an astronomical observatory instead
Assuming Prague (Czech Republic) | Use
Prague (Oklahoma, USA) or Prague (Nebraska, USA) instead

WolframAlpha 

```
WeatherData["Prague", "Temperature"]
```

11.5 °C

Získávání údajů o státech

Wolfram Alpha

 Australia

Assuming "Australia" is a country | Use as a solar system feature instead

Input interpretation: +

Australia

Name: More +

full name	Commonwealth of Australia
internet code	.au

Dependencies: +

Christmas Island | Cocos Keeling Islands | Norfolk Island

Cultural properties: More Show charts +

languages	English (88%) Italian (1.5%) Greek (1.2%) Cantonese (1.2%) Arabic (1.2%) ...
ethnic mix	white (92%) Asian (7%) aboriginal and other (1%)
religions	Christianity (77%) Buddhism (2.1%) Islam (1.6%) Hinduism (0.56%) Judaism (0.49%) ...
literacy rate	99% (2003 estimate)

Capital city: +

Canberra, Australian Capital Territory

[Satellite image »](#)

Currency: +

currency name	Au\$1 (Australian dollar)
currency code	AUD
local currency conversion	Au\$1 (Australian dollar) = Kč18.94 (Czech koruny)
currency conversion	Au\$1 (Australian dollar) = 87.67¢ (US cents)

WolframAlpha +

Mathematica

```

{CountryData[#, "Name"], CountryData[#, "Area"],
 CountryData[#, "Population"]} & /@ CountryData["Countries"]
{ {Afghanistan, 652230. km2, 3.44999 × 107 people},
  {Albania, 28748. km2, 3.23832 × 106 people},
  {Algeria, 2.38174 × 106 km2, 3.69839 × 107 people},
  {American Samoa, 199. km2, 54719. people}, {Andorra, 468. km2, 85293. people},
  {Angola, 1.2467 × 106 km2, 2.07145 × 107 people},
  {Anguilla, 102. km2, 15754. people},
  {Antigua and Barbuda, 442.6 km2, 90156. people},
  {Argentina, 2.76689 × 106 km2, 4.1474 × 107 people},
  {Armenia, 29743. km2, 3.11772 × 106 people}, {Aruba, 180. km2, 108883. people},
  {Australia, 7.68685 × 106 km2, 2.32139 × 107 people},
  {Austria, 83871. km2, 8.44126 × 106 people},
  {Azerbaijan, 86600. km2, 9.53345 × 106 people},
  {Bahamas, 13880. km2, 355233. people}, {Bahrain, 741. km2, 1.37727 × 106 people},
  {Bangladesh, 143998. km2, 1.54394 × 108 people},
  {Barbados, 430. km2, 275141. people}, {Belarus, 207600. km2, 9.49829 × 106 people},
  {Belgium, 30528. km2, 1.08156 × 107 people},
  {Belize, 22966. km2, 330721. people}, {Benin, 112622. km2, 9.60653 × 106 people},
  {Bermuda, 54. km2, 69467. people}, {Bhutan, 38394. km2, 762313. people},
  {Bolivia, 1.09858 × 106 km2, 1.04098 × 107 people},
  {Bosnia and Herzegovina, 51197. km2, 3.73588 × 106 people},
  {Botswana, 581730. km2, 2.07462 × 106 people},
  {Brazil, 8.51488 × 106 km2, 2.0005 × 108 people},
  {British Virgin Islands, 151. km2, 23000. people},
  {Brunei, 5765. km2, 419772. people}, {Bulgaria, 110879. km2, 7.34946 × 106 people},
  {Burkina Faso, 274200. km2, 1.80115 × 107 people},
  {Burundi, 27830. km2, 8.91118 × 106 people},
  {Cambodia, 181035. km2, 1.4656 × 107 people},
  {Cameroon, 475440. km2, 2.09136 × 107 people},
  {Canada, 9.98467 × 106 km2, 3.49937 × 107 people},
  {Cape Verde, 4033. km2, 510213. people},
  {Cayman Islands, 264. km2, 53737. people},
  {Central African Republic, 622984. km2, 4.66683 × 106 people},
  {Chad, 1.284 × 106 km2, 1.21419 × 107 people},
  {Chile, 756102. km2, 1.75745 × 107 people},
  {China, 9.59696 × 106 km2, 1.35937 × 109 people},
  {Christmas Island, 135. km2, 1462. people},
  {Cocos Keeling Islands, 14. km2, 605. people},
  {Colombia, 1.13891 × 106 km2, 4.81652 × 107 people},
  {Comoros, 2235. km2, 792913. people}, {Cook Islands, 236. km2, 10447. people},
  {Costa Rica, 51100. km2, 4.85996 × 106 people},

```



```

{Croatia, 56594. km2, 4.37881×106 people},
{Cuba, 110860. km2, 1.12444×107 people},
{Curacao, 444. km2, 146836. people}, {Cyprus, 9251. km2, 1.14145×106 people},
{Czech Republic, 78867. km2, 1.05898×107 people},
{Democratic Republic of the Congo, 2.34486×106 km2, 7.14197×107 people},
{Denmark, 43094. km2, 5.61119×106 people},
{Djibouti, 23200. km2, 940090. people}, {Dominica, 751. km2, 73286. people},
{Dominican Republic, 48670. km2, 1.03086×107 people},
{East Timor, 14874. km2, 1.22367×106 people},
{Ecuador, 283561. km2, 1.50614×107 people},
{Egypt, 1.00145×106 km2, 8.53784×107 people},
{El Salvador, 21041. km2, 6.30272×106 people},
{Equatorial Guinea, 28051. km2, 761050. people},
{Eritrea, 121320. km2, 5.7483×106 people},
{Estonia, 45228. km2, 1.33883×106 people},
{Ethiopia, 1.12713×106 km2, 8.83564×107 people},
{Falkland Islands, 12173. km2, 3140. people},
{Faroe Islands, 1393. km2, 49709. people}, {Fiji, 18274. km2, 882863. people},
{Finland, 338145. km2, 5.41876×106 people},
{France, 547030. km2, 6.3783×107 people},
{French Guiana, 91000. km2, 249408. people},
{French Polynesia, 4167. km2, 279632. people},
{Gabon, 267667. km2, 1.59421×106 people},
{Gambia, 11295. km2, 1.87436×106 people},
{Gaza Strip, 360. km2, 1.76339×106 people},
{Georgia, 69700. km2, 4.27841×106 people},
{Germany, 357022. km2, 8.18042×107 people},
{Ghana, 238533. km2, 2.61313×107 people}, {Gibraltar, 6.5 km2, 29111. people},
{Greece, 131940. km2, 1.14457×107 people},
{Greenland, 2.16609×106 km2, 57714. people}, {Grenada, 344. km2, 105719. people},
{Guadeloupe, 1780. km2, 467335. people}, {Guam, 544. km2, 186562. people},
{Guatemala, 108889. km2, 1.55275×107 people},
{Guernsey, 78. km2, 65605. people}, {Guinea, 245857. km2, 1.07537×107 people},
{Guinea-Bissau, 36125. km2, 1.61291×106 people},
{Guyana, 214969. km2, 759262. people}, {Haiti, 27750. km2, 1.03884×107 people},
{Honduras, 112090. km2, 8.07152×106 people},
{Hong Kong, 1104. km2, 7.27413×106 people},
{Hungary, 93028. km2, 9.9338×106 people}, {Iceland, 103000. km2, 331996. people},
{India, 3.28726×106 km2, 1.27514×109 people},
{Indonesia, 1.90457×106 km2, 2.47188×108 people},
{Iran, 1.648×106 km2, 7.6407×107 people},
{Iraq, 437072. km2, 3.47762×107 people},
{Ireland, 70273. km2, 4.63139×106 people},
{Isle of Man, 572. km2, 86159. people}, {Israel, 20770. km2, 7.81886×106 people},

```

```

{Italy, 301 340. km2, 6.10874 × 107 people},
{Ivory Coast, 322 463. km2, 2.10573 × 107 people},
{Jamaica, 10 991. km2, 2.77118 × 106 people},
{Japan, 377 835. km2, 1.26345 × 108 people},
{Jersey, 116. km2, 95 732. people}, {Jordan, 89 342. km2, 6.5729 × 106 people},
{Kazakhstan, 2.7249 × 106 km2, 1.6551 × 107 people},
{Kenya, 582 650. km2, 4.39237 × 107 people},
{Kiribati, 811. km2, 103 248. people}, {Kosovo, 10 887. km2, 1.84771 × 106 people},
{Kuwait, 17 818. km2, 2.95902 × 106 people},
{Kyrgyzstan, 199 951. km2, 5.50325 × 106 people},
{Laos, 236 800. km2, 6.45891 × 106 people},
{Latvia, 64 589. km2, 2.22626 × 106 people},
{Lebanon, 10 452. km2, 4.32406 × 106 people},
{Lesotho, 30 355. km2, 2.24013 × 106 people},
{Liberia, 111 369. km2, 4.34874 × 106 people},
{Libya, 1.75954 × 106 km2, 6.5061 × 106 people},
{Liechtenstein, 160. km2, 37 009. people},
{Lithuania, 65 300. km2, 3.27834 × 106 people},
{Luxembourg, 2586. km2, 530 018. people}, {Macau, 28.2 km2, 578 844. people},
{Macedonia, 25 713. km2, 2.06922 × 106 people},
{Madagascar, 587 041. km2, 2.2555 × 107 people},
{Malawi, 118 484. km2, 1.64069 × 107 people},
{Malaysia, 329 847. km2, 2.97872 × 107 people},
{Maldives, 298. km2, 328 551. people},
{Mali, 1.24019 × 106 km2, 1.68082 × 107 people},
{Malta, 316. km2, 420 557. people}, {Marshall Islands, 181. km2, 69 747. people},
{Martinique, 1100. km2, 409 366. people},
{Mauritania, 1.0307 × 106 km2, 3.70441 × 106 people},
{Mauritius, 2040. km2, 1.32079 × 106 people}, {Mayotte, 374. km2, 223 907. people},
{Mexico, 1.96438 × 106 km2, 1.17478 × 108 people},
{Micronesia, 702. km2, 112 726. people},
{Moldova, 33 851. km2, 3.49566 × 106 people}, {Monaco, 1.95 km2, 30 500. people},
{Mongolia, 1.56412 × 106 km2, 2.88786 × 106 people},
{Montenegro, 13 812. km2, 633 167. people}, {Montserrat, 102. km2, 5189. people},
{Morocco, 446 550. km2, 3.29256 × 107 people},
{Mozambique, 799 380. km2, 2.50283 × 107 people},
{Myanmar, 676 578. km2, 4.91196 × 107 people},
{Namibia, 824 292. km2, 2.40448 × 106 people},
{Nauru, 21. km2, 10 000. people}, {Nepal, 147 181. km2, 3.15355 × 107 people},
{Netherlands, 41 543. km2, 1.67616 × 107 people},
{New Caledonia, 18 575. km2, 262 605. people},
{New Zealand, 268 680. km2, 4.50817 × 106 people},
{Nicaragua, 130 370. km2, 6.04176 × 106 people},
{Niger, 1.267 × 106 km2, 1.72398 × 107 people},

```

```

{Nigeria, 923 768. km2, 1.70901 × 108 people},
{Niue, 260. km2, 1000. people}, {Norfolk Island, 36. km2, 2141. people},
{Northern Mariana Islands, 464. km2, 88 000. people},
{North Korea, 120 538. km2, 2.46544 × 107 people},
{Norway, 323 802. km2, 4.992 × 106 people}, {Oman, 309 500. km2, 2.95733 × 106 people},
{Pakistan, 796 095. km2, 1.83189 × 108 people},
{Palau, 459. km2, 21 108. people}, {Panama, 75 420. km2, 3.67826 × 106 people},
{Papua New Guinea, 462 840. km2, 7.32728 × 106 people},
{Paraguay, 406 752. km2, 6.79824 × 106 people},
{Peru, 1.28522 × 106 km2, 3.00752 × 107 people},
{Philippines, 300 000. km2, 9.81128 × 107 people},
{Pitcairn Islands, 47. km2, 48. people},
{Poland, 312 685. km2, 3.83318 × 107 people},
{Portugal, 92 090. km2, 1.07045 × 107 people},
{Puerto Rico, 9045. km2, 3.74233 × 106 people},
{Qatar, 11 586. km2, 1.97684 × 106 people},
{Republic of the Congo, 342 000. km2, 4.3242 × 106 people},
{Réunion, 2517. km2, 874 944. people}, {Romania, 238 391. km2, 2.13388 × 107 people},
{Russia, 1.70752 × 107 km2, 1.42558 × 108 people},
{Rwanda, 26 338. km2, 1.16084 × 107 people},
{Saint Helena, Ascension and Tristan da Cunha, 413. km2, 7670. people},
{Saint Kitts and Nevis, 261. km2, 51 134. people},
{Saint Lucia, 616. km2, 179 515. people},
{Saint Pierre and Miquelon, 242. km2, 5774. people},
{Saint Vincent and the Grenadines, 389. km2, 109 354. people},
{Samoa, 2831. km2, 185 727. people}, {San Marino, 61. km2, 32 448. people},
{São Tomé and Príncipe, 964. km2, 175 383. people},
{Saudi Arabia, 1.96058 × 106 km2, 2.93194 × 107 people},
{Senegal, 196 722. km2, 1.34542 × 107 people},
{Serbia, 77 474. km2, 9.83501 × 106 people}, {Seychelles, 455. km2, 90 846. people},
{Sierra Leone, 71 740. km2, 6.25516 × 106 people},
{Singapore, 697. km2, 5.30091 × 106 people}, {Sint Maarten, 34. km2, 39 689. people},
{Slovakia, 49 035. km2, 5.48878 × 106 people},
{Slovenia, 20 273. km2, 2.04477 × 106 people},
{Solomon Islands, 28 896. km2, 580 791. people},
{Somalia, 637 657. km2, 1.00528 × 107 people},
{South Africa, 1.21909 × 106 km2, 5.09811 × 107 people},
{South Korea, 98 480. km2, 4.87748 × 107 people},
{South Sudan, 644 329. km2, 1.10901 × 107 people},
{Spain, 504 782. km2, 4.70426 × 107 people},
{Sri Lanka, 65 610. km2, 2.13939 × 107 people},
{Sudan, 1.88607 × 106 km2, 4.68229 × 107 people},
{Suriname, 163 820. km2, 538 882. people}, {Svalbard, 62 045. km2, 2495. people},
{Swaziland, 17 364. km2, 1.23717 × 106 people},

```

```
{Sweden, 450 295. km2, 9.54582 × 106 people},
{Switzerland, 41 277. km2, 7.76182 × 106 people},
{Syria, 185 180. km2, 2.1469 × 107 people},
{Taiwan, 35 980. km2, 2.32997 × 107 people},
{Tajikistan, 143 100. km2, 7.18353 × 106 people},
{Tanzania, 945 087. km2, 4.9153 × 107 people},
{Thailand, 513 120. km2, 7.02433 × 107 people},
{Togo, 56 785. km2, 6.41256 × 106 people},
{Tokelau, 12. km2, 1416. people}, {Tonga, 747. km2, 105 265. people},
{Trinidad and Tobago, 5128. km2, 1.35534 × 106 people},
{Tunisia, 163 610. km2, 1.08137 × 107 people},
{Turkey, 780 580. km2, 7.5359 × 107 people},
{Turkmenistan, 488 100. km2, 5.23464 × 106 people},
{Turks and Caicos Islands, 948. km2, 47 754. people},
{Tuvalu, 26. km2, 10 698. people}, {Uganda, 236 040. km2, 3.67593 × 107 people},
{Ukraine, 603 550. km2, 4.46967 × 107 people},
{United Arab Emirates, 83 600. km2, 8.20794 × 106 people},
{United Kingdom, 243 610. km2, 6.31774 × 107 people},
{United States, 9.63142 × 106 km2, 3.1933 × 108 people},
{United States Virgin Islands, 349. km2, 108 300. people},
{Uruguay, 176 215. km2, 3.40312 × 106 people},
{Uzbekistan, 447 400. km2, 2.83982 × 107 people},
{Vanuatu, 12 189. km2, 257 812. people}, {Vatican City, 0.44 km2, 826. people},
{Venezuela, 912 050. km2, 3.03406 × 107 people},
{Vietnam, 329 560. km2, 9.06566 × 107 people},
{Wallis and Futuna Islands, 142. km2, 15 343. people},
{West Bank, 5860. km2, 2.67674 × 106 people},
{Western Sahara, 266 000. km2, 585 270. people},
{Yemen, 527 968. km2, 2.6358 × 107 people},
{Zambia, 752 618. km2, 1.43145 × 107 people},
{Zimbabwe, 390 757. km2, 1.33279 × 107 people}}
```

"Population", "Area", "GPD", "GovernmentDebt", "UnemploymentFraction",
"AnnualBirths", "AnnualDeaths", "Languages" "InflationRate"



```
hlavicka = {"Název", "Rozloha", "Populace", "HDP", "Dluh", "Inflace",
  "Nezamestnanost", "Pocet novorozenat za rok", "Pocet umrti za rok", "Jazyky"}
{Název, Rozloha, Populace, HDP, Dluh, Inflace, Nezamestnanost,
  Pocet novorozenat za rok, Pocet umrti za rok, Jazyky}
```

```
data =
{CountryData[#, "Name"], CountryData[#, "Area"], CountryData[#, "Population"],
CountryData[#, "GDP"], CountryData[#, "GovernmentDebt"],
CountryData[#, "InflationRate"], CountryData[#, "UnemploymentFraction"],
CountryData[#, "AnnualBirths"], CountryData[#, "AnnualDeaths"],
CountryData[#, "Languages"]} & /@ CountryData["Countries"]
```

A very large output was generated. Showing a sample of it.

```
{ {Afghanistan, 652 230., 2.9117 × 107, 1.26787 × 1010,
Missing[NotAvailable], 0.212196, 0.4, 1.19534 × 106, 510 275.,
{FarsiEastern, Hazaragi, UzbekSouthern, PashtoSouthern, Turkmen,
Aimaq, Brahui, BalochiWestern, PashayiSouthwest, PashayiSoutheast,
PashayiNortheast, Shughni, Kati, Tangshewi, Darwazi, Wakhi, GawarBati,
Warduji, Grangali, ArabicTajikiSpoken, Kamviri, Munji, Uyghur, Savi,
Malakhel, Pahlavani, WotapuriKatarqalai, Kazakh, Karakalpak, Gujar,
Waigali, Jakati, Parya, Ashkun, Tregami, Shumashti, SanglechiIshkashimi,
Prasuni, Kirghiz, Parachi, Mogholi, Tirahi, Ormuri}}, <<238>>,
{Zimbabwe, 390 757., 1.2644 × 107, 3.91183 × 109, 2.41306 × 109, 0.0145036,
0.8, 362 188., 287 052., {Shona, Ndebele, Manyika, Ndau, Kalanga, English,
Nyanja, Kunda, Tonga, Nambya, Venda, Lozi, Tswana, Nsenga, Tsoa}}}
```

[show less](#)
[show more](#)
[show all](#)
[set size limit...](#)

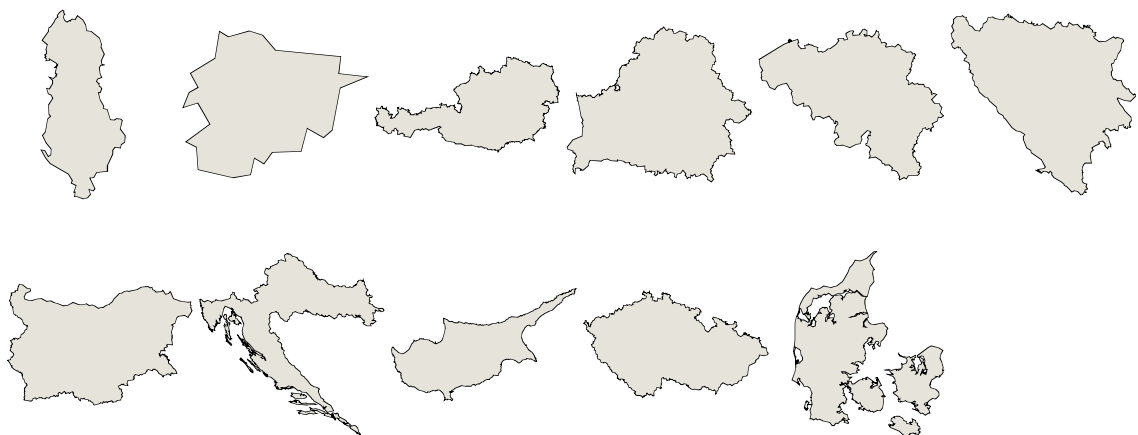
```
Export[NotebookDirectory[] <> "data_statistika.xls", Prepend[data, hlavicka]]
```

C:\Users\Radim\Desktop\data_statistika.xls

Slepé mapy států

```
Row[
```

```
Show[CountryData[#, "Shape"], ImageSize → {100, 100}] & /@ CountryData["Europe"]]
```







Astronomie

Wolfram Alpha



Assuming “saturn” is a planet | Use as **an auto dealership** or **a given name** instead

Input interpretation:

Saturn (planet)

Orbital properties:

Show non-metric

More

Show history

current distance from Earth	9.096 au 1.261 light hours
average distance from Earth	9.58 au 1.33 light hours
current distance from Sun	9.919 au 1.375 light hours
largest distance from orbit center	1.503983×10^9 km 10.05351 au
nearest distance from orbit center	1.349467×10^9 km 9.020632 au
orbital period	29.447498 Julian years

Units

Physical properties:

Show non-metric

More

equatorial radius	60 268 km $9.4492 a_{\oplus}$
mass	5.68319×10^{26} kg $95.1608 M_{\oplus}$

rotation period	10.656 h (sidereal)
number of moons	61 (known)
age	4.5 billion yr

Units

Symbol:

♃

Atmosphere:

Use Fahrenheit

Show minor constituents

Show pie chart

atmospheric pressure	0.4 bars (at visible cloud level)
average temperature	−139 °C (at 1 bar)

Major constituents:

hydrogen (H ₂)	94%
helium (He)	6%

(components may not add up to 100% due to uncertainty, variability, and round-off)

Current ring configuration

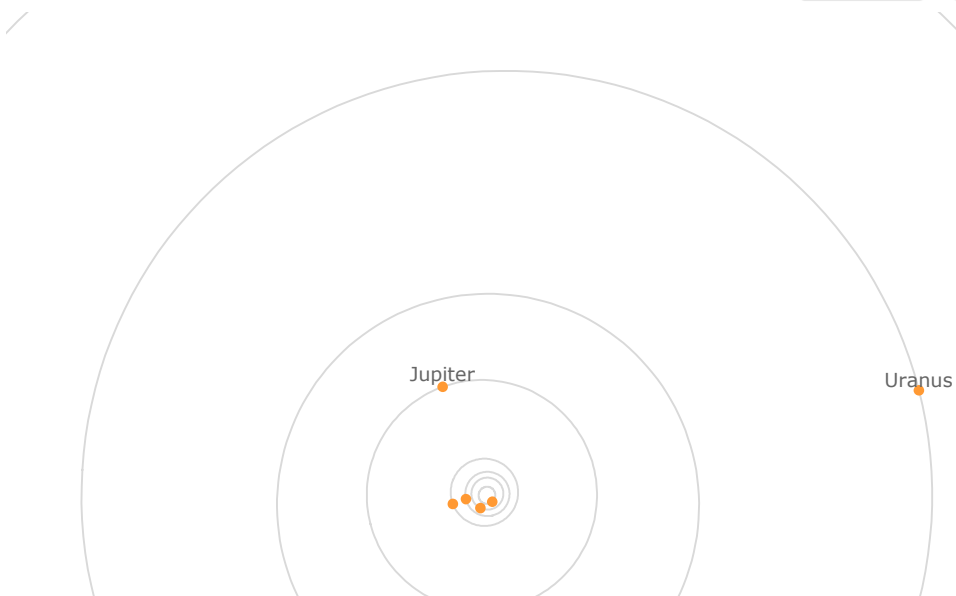
as seen from Earth:



Larger image

Current solar system configuration:

Zoom in Zoom out





Current equatorial location:

Show decimal +

right ascension	$15^{\text{h}} 23^{\text{m}} 40^{\text{s}}$
declination	$-16^{\circ} 4' 11''$

Units

Image:



Nearby sky objects:

Brighter than 2nd magnitude ▾

Details +

Antares | Spica | Shaula | Arcturus | θ Scorpii | Kaus Australis |
Rigel Kentaurus A | Rigel Kentaurus B | Hadar | Mimosa | Gacrux | ...

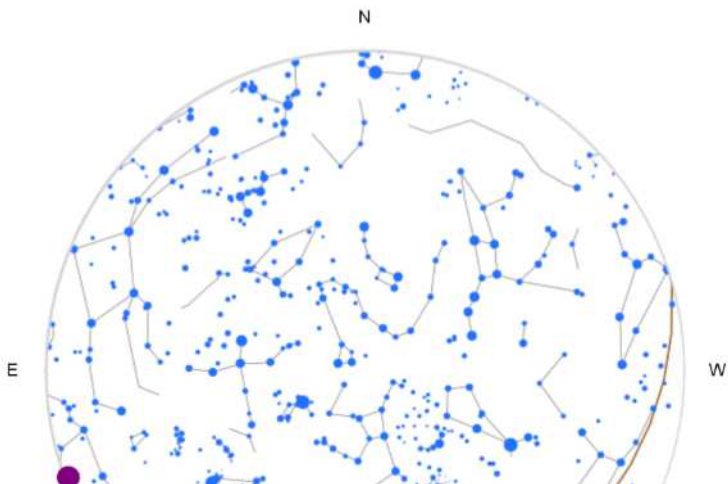
Current sky position from

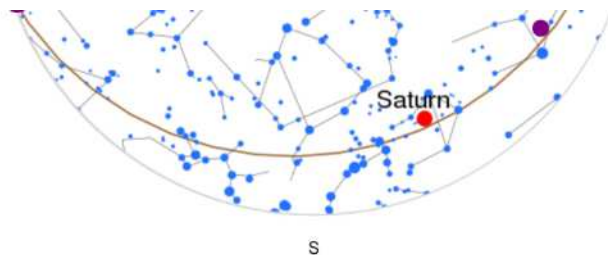
Show mesh

Zoom

Show decimal +

Prague, Hlavní město Praha:





altitude	20° 7' (↙)
azimuth	206° 22' (SSW)
next rise	10:50 pm CEST Friday, April 4, 2014
next set	8:20 am CEST Friday, April 4, 2014
constellation	Libra

Local sidereal time:

17^h 5^m 40.65^s

WolframAlpha +

pioneer 10

Input interpretation:

Pioneer 10 (deep space probe)

Probe properties:

Show non-metric

More

target	Jupiter
mass	258 kg
length	2.9 m
width	2.9 m
heliocentric velocity	12 km/s
orbital inclination	3.1°
power source	radioisotope thermoelectric generator
distance from Sun	1.65 × 10 ¹⁰ km 111 au
distance from Earth	1.66 × 10 ¹⁰ km 111 au

Units

Mission properties:

More

launch date Friday, March 3, 1972 (42 years ago)

Orbit path:

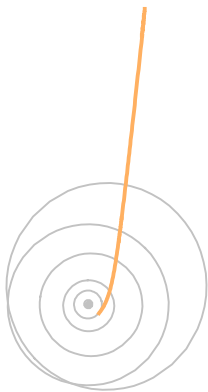


Image:



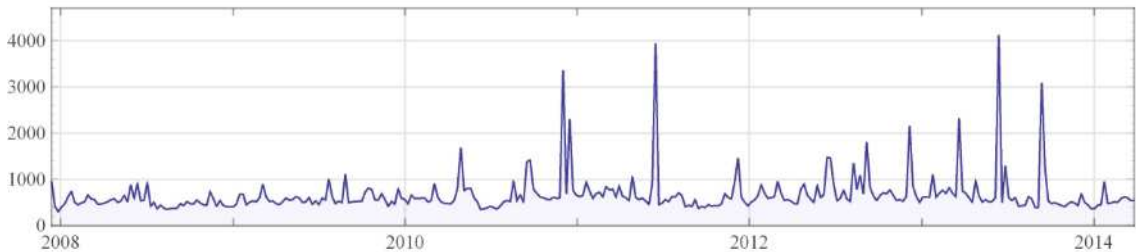
Current sky position from
Prague, Hlavní město Praha:
(not currently visible)

Show decimal

altitude	$-13^{\circ} 52'$ (below horizon)
azimuth	$4^{\circ} 17'$ (N)
constellation	Taurus

Wikipedia page hits history:

Log scale



(in hits per day)

(based on weekly averages of daily hits to English-language "Pioneer 10" page)

WolframAlpha



Assuming “sirius” is an astronomical object | Use as

a class of satellites or an internet domain or [more](#) | ▾ instead

Assuming Sirius | Use [Sirius B](#) instead

Input interpretation:

Sirius (star)

Properties:

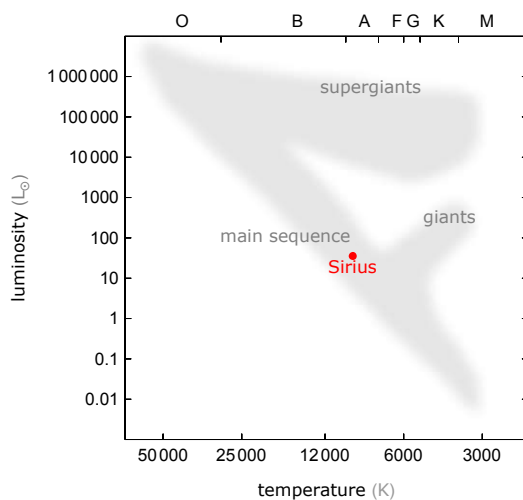
[More](#)

[Show history](#)

distance from Earth	8.591 ly
apparent magnitude	− 1.44 (easily visible to the naked eye)
absolute magnitude	+ 1.45 (visual)
spectral class	A1Vm (main sequence enhanced metal features)
effective temperature	9400 K
mass	5.2×10^{30} kg $2.6 M_{\odot}$
main sequence lifetime	820 million yr
end state	carbon–oxygen white dwarf
Bayer name	α Canis Majoris (Alpha Canis Majoris)

[Units](#)

Hertzsprung–Russell diagram:



Schematic evolution: +



Equatorial location: +

Show decimal

right ascension	6 ^h 45 ^m 9 ^s
declination	−16° 42′ 47″

Units

Nearby sky objects: +

Brighter than 2nd magnitude

Details

Mirzam | Wezen | Adhara | Alnitak | Alnilam |
Rigel | Procyon | Betelgeuse | Bellatrix | Alhena | ...

Nearby known stars in 3D: +

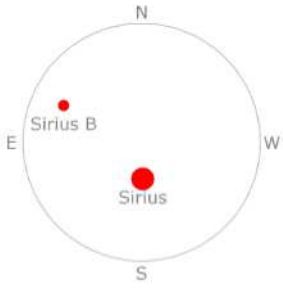
Details

More

Show 3D

Sirius B | Procyon | Gl 280 B | HIP 30920 | Gl 234 B |
Luyten's Star | Kapteyn's Star | ε Eridani | Sun | Wolf 359

Star system containing Sirius: +



system members	Sirius	Sirius B
component	A	B
color		
apparent magnitude	−1.44	+ 8.44
separation	0"	10.14"
position angle	0°	47.09°

Current sky position from

Show decimal



Prague, Hlavní město Praha:

(not currently visible)

altitude	$-51^{\circ} 12'$ (below horizon)
azimuth	$320^{\circ} 30'$ (NW)
next rise	2:18 pm CEST Friday, April 4, 2014
next set	11:36 pm CEST Friday, April 4, 2014
constellation	Canis Major

Local sidereal time:

 $17^{\text{h}} 6^{\text{m}} 49.77^{\text{s}}$

WolframAlpha

Wolfram Mathematica

AstronomicalData["Classes"]

```
{AlgolVariable, Alpha2CanumVenaticorumVariable, AmorAsteroid, ApolloAsteroid,
ARLacertaeVariable, AtenAsteroid, BarredSpiralGalaxy, BayerObject,
BetaLyraeVariable, BrightGiant, BrightHIIRegion, BYDraconisVariable,
CarbonStar, CentaurAsteroid, CepheidVariable, ChironTypeComet,
ClassAStar, ClassBStar, ClassCStar, ClassFStar, ClassGStar, ClassKStar,
ClassMStar, ClassNStar, ClassOStar, ClassRStar, ClassSStar, Comet,
DeepSkyObject, DeltaScutiVariable, DwarfEllipticalGalaxy, DwarfPlanet,
DwarfSpheroidalGalaxy, EclipsingVariable, EllipticalGalaxy,
EnckeTypeComet, Exoplanet, FKComaeBerenicesVariable, FlamsteedObject,
Galaxy, GammaCassiopeiaeVariable, GammaDoradusVariable, GlieseObject,
GlobularCluster, HalleyTypeComet, HDObject, HipparcosObject, HRObjct,
HyperbolicComet, ICObjct, InnerMainBeltAsteroid, IrregularGalaxy,
JupiterFamilyComet, LocalGroup, MainBeltAsteroid, MainSequenceStar,
MarsCrossingAsteroid, MessierObject, MinorPlanet, MiraVariable, MultipleStar,
NakedEyeStar, NearEarthAsteroid, Nebula, NGCObject, NormalGiant, Nova,
OpenCluster, OuterMainBeltAsteroid, ParabolicComet, PGCObject, Planet,
PlanetaryMoon, PlanetaryNebula, Plutoid, RCoronaeBorealisVariable,
RRLyraeVariable, RSCanumVenaticorumVariable, RVTauriVariable, SAOObject,
SDoradusVariable, SemiregularVariable, SpiralGalaxy, Star, StarBrightest10,
StarBrightest100, StarNearest10, StarNearest100, Subdwarf, Subgiant,
Supergiant, SXArietisVariable, TransNeptunianObject, TrojanAsteroid,
UGeminorumVariable, UVCetiVariable, VariableStar, WhiteDwarfStar,
WolfRayetStar, WUrsaeMajorisVariable, ZAndromedaeVariable, ZZCetiVariable}
```

AstronomicalData["StarBrightest100"]

```
{Sun, Sirius, Canopus, Arcturus, RigelKentaurusA, Vega, Capella, Rigel,
Procyon, Achernar, Betelgeuse, Hadar, Altair, Acrux, Aldebaran, CapellaAb,
Spica, Antares, Pollux, Fomalhaut, Mimosa, Deneb, RigelKentaurusB,
Regulus, Adhara, Castor, Gacrux, Shaula, Bellatrix, Alnath, Miaplacidus,
Alnilam, Alnair, Alnitak, Regor, Alioth, Mirphak, KausAustralis,
Dubhe, Wezen, Alkaid, Avior, ThetaScorpii, Menkalinan, Atria, Alhena,
DeltaVelorum, Peacock, Polaris, Mirzam, Alphard, Hamal, Algieba, Diphda,
Nunki, Menkent, Alpheratz, Mirach, Saiph, Kochab, BetaGruis, Rasalhague,
Algol, Almach, Denebola, Tsih, GammaCentauri, Naos, Aspidiske, Alphekka,
Alsu hail, Mizar, Sadr, Shedir, Etamin, Mintaka, Caph, EpsilonCentauri,
Dschubba, EpsilonScorpii, AlphaLupi, EtaCentauri, Merak, Izar, Enif,
KappaScorpii, Ankaa, Phad, Sabik, Scheat, Aludra, Alderamin, KappaVelorum,
EpsilonCygni, Markab, Menkar, ZetaOphiuchi, ZetaCentauri, Zosma, Acrab}
```

Nauka o Zemi

<http://www.wolframalpha.com/examples/EarthSciences.html>

Zemětřesení

 earthquake Japan

Input interpretation:

earthquakes

Japan

Results:

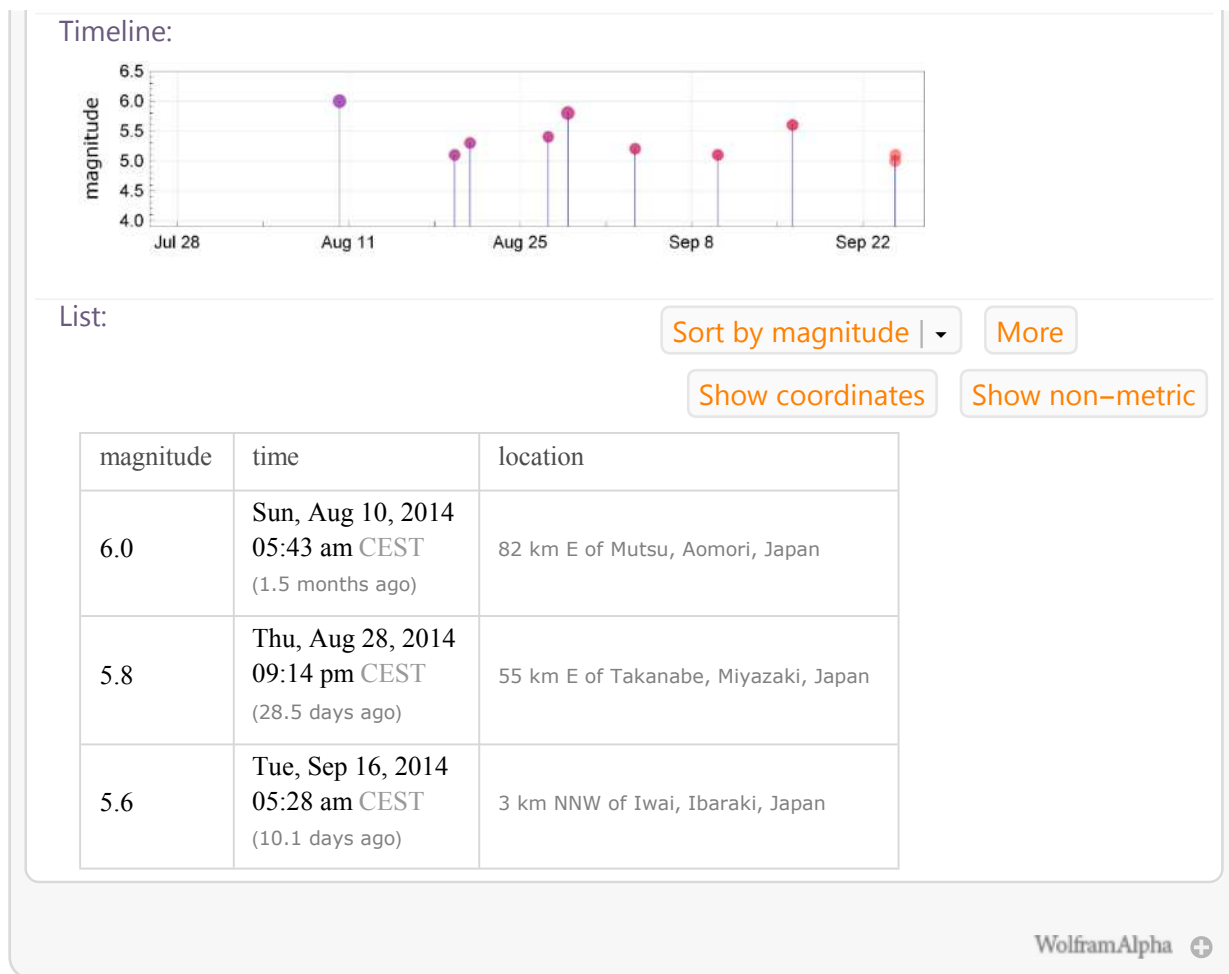
Last 2 months

Magnitude > 5

CEST

Show local map





Mathematica v dějepisu

Náměty do dějepisu

history

Assuming "history" is a general topic |

Use as **a class of mathematical terms** or **a word** instead

People & History

get information about a person

Harriet Tubman »

compare several people

Albert Einstein, Paul Dirac, Richard Feynman »

compute a family relationship

compute a family relationship

[father's mother's sister's son »](#)

[grandmother's aunt »](#)

get information about a surname

[name Jones »](#)

compare given names

[Elizabeth, Rebecca, Jennifer »](#)

get information about an occupation

[chiropractor »](#)

compare salaries

[salary mathematician, physicist, chemist »](#)

analyze your Facebook data

[facebook report »](#)

click on friends' names to analyze their shared Facebook data

[facebook friends »](#)

get information about a current political leader

[President of Argentina »](#)

get information about a past political leader

[16th President of the United States »](#)

get the date of a historical event

[Battle of Hastings »](#)

construct a timeline of events

[founding of Carthage, Trojan War »](#)

find the date range associated to a historical period

[Bronze age »](#)

compare historical periods

[Elizabethan era, Jacobean era »](#)

get information about a historical country or kingdom

[Holy Roman Empire »](#)

compare multiple historical countries

[Bernicia, Northumbria »](#)

convert Roman numerals to standard number notation

[MDCCLXXX »](#)

MDCCLXXVI »

convert a decimal number to Mayan numerals

365 to Mayan »

compute the current value of a historical quantity of US money

US\$2500 (1950 US dollars) »

compute historical equivalent value of today's US money

10,000 current US dollars in 1910 »

compare inventions

magnetic tape, iPod »

look up an invention property

when was the airbag invented? »

WolframAlpha 

Mohli se potkat...



feynman einstein

Input interpretation: 

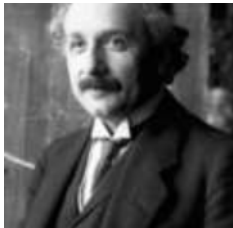
Richard Feynman (physicist) | Albert Einstein (physicist)

Basic information: 

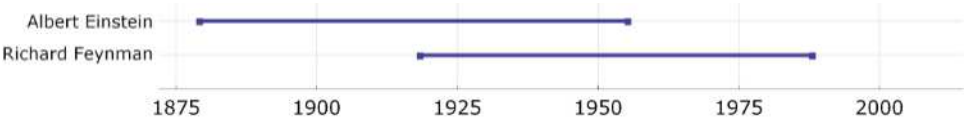
	Richard Feynman	Albert Einstein
full name	Richard Phillips Feynman	Albert Einstein
date of birth	Saturday, May 11, 1918 (96 years ago)	Friday, March 14, 1879 (135 years ago)
place of birth	New York City, New York, United States	Ulm, Baden- Wurttemberg, Germany
date of death	Monday, February 15, 1988 (age: 69 years) (26 years ago)	Monday, April 18, 1955 (age: 76 years) (59 years ago)
place of death	Los Angeles, California, United States	Princeton, New Jersey, United States

Images: 

Richard Feynman	Albert Einstein
	



Timeline:



Nobel prizes:

Show achievements

year	recipient	field	country of achievement	country of birth
1965	Richard Feynman	physics	United States	United States
1921	Albert Einstein	physics	Switzerland	Germany

Physical characteristics:

Non-metric

	height	weight
Albert Einstein	1.75 meters	90 kg (kilograms)

Familial relationships:

Show full dates

Parents:

Richard Feynman	Melville Feynman Lucille Phillips
Albert Einstein	Hermann Einstein Pauline Einstein

Siblings:

Richard Feynman	Joan Feynman
Albert Einstein	Maja Einstein

Spouses:

Richard Feynman	Arline Greenbaum (1942–1945) Mary Louise Bell (1952–1956) Gweneth Howarth (1960–1988)
Albert Einstein	Mileva Marić (1903–1919) Elsa Einstein (1919–1936)

Children:

Richard Feynman	Carl Feynman Michelle Louise Feynman
Albert Einstein	Eduard Einstein Lieserl Einstein Hans Albert Einstein

Scientific contributions:

Mathematics:

Richard Feynman	Feynman point tetrahedral vacuum Feynman diagram
Albert Einstein	Bose- Einstein distribution Einstein field equations Einstein functions Einstein summation Einstein tensor

Physics:

Albert Einstein	Brownian motion Ehrenfest paradox EPR paradox photoelectric effect twin paradox particle in an external electromagnetic field
-----------------	---

Notable films:

Appeared in:

Richard Feynman	Genghis Blues (1999)
-----------------	----------------------

Writer:

Richard Feynman	Infinity (1996)
-----------------	-----------------

Notable books:

Richard Feynman	The Character Of Physical Law (1965) Classic Feynman: All the Adventures of a Curious Character (2005) Perfectly Reasonable Deviations from the Beaten Track (2005) "Surely You're Joking, Mr. Feynman!": Adventures of a Curious Character (1985)
-----------------	--

Wikipedia summary:

Richard Feynman:

Richard Phillips Feynman was an American theoretical physicist known for his work in the path integral formulation of quantum mechanics, the theory of quantum electrodynamics, and the physics of the superfluidity of supercooled liquid helium, as well as in particle physics (he proposed the parton model). For his contributions to the development of quantum electrodynamics, Feynman, jointly with Julian Schwinger and Sin-Itiro Tomonaga, received the Nobel Prize in Physics in 1965. He developed a widely used pictorial representation scheme for the mathematical expressions governing the behavior of subatomic particles, which later became known as Feynman diagrams. During his lifetime, Feynman became one of the best-known scientists in the world. In a 1999 poll of 130 leading physicists worldwide by the British journal *Physics World* he was ranked as one of the ten greatest physicists of all time.

Albert Einstein:

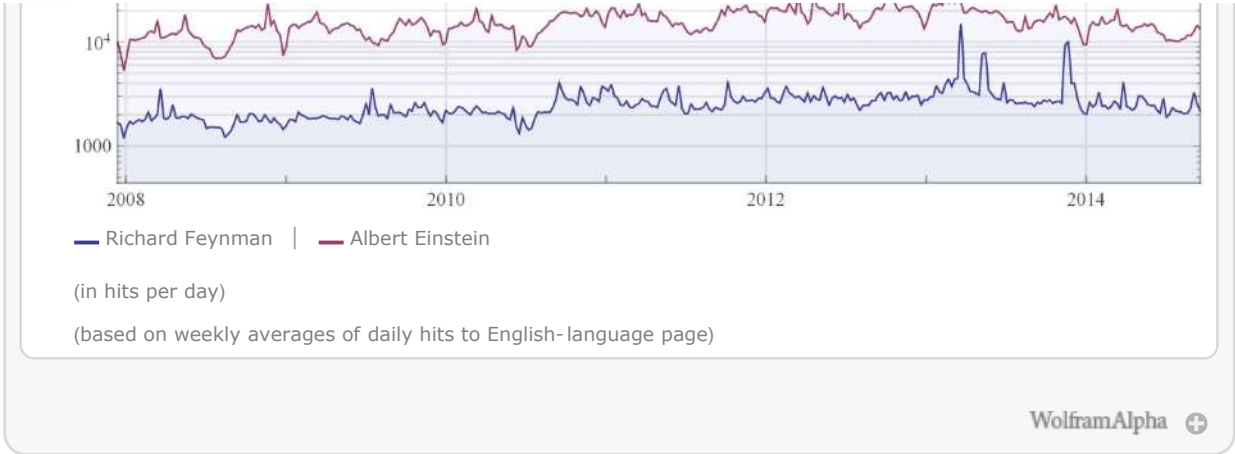
Albert Einstein was a German-born theoretical physicist who developed the general theory of relativity, one of the two pillars of modern physics (alongside quantum mechanics). While best known for his mass-energy equivalence formula $E = mc^2$ (which has been dubbed "the world's most famous equation"), he received the 1921 Nobel Prize in Physics "for his services to theoretical physics, and especially for his discovery of the law of the photoelectric effect". The latter was pivotal in establishing quantum theory.

Wikipedia page hits history:

Linear scale

(log scale)





Doba bronzová



bronze age

Assuming “bronze age” is a class of historical periods | Use as a word instead

Input interpretation:

Bronze Age

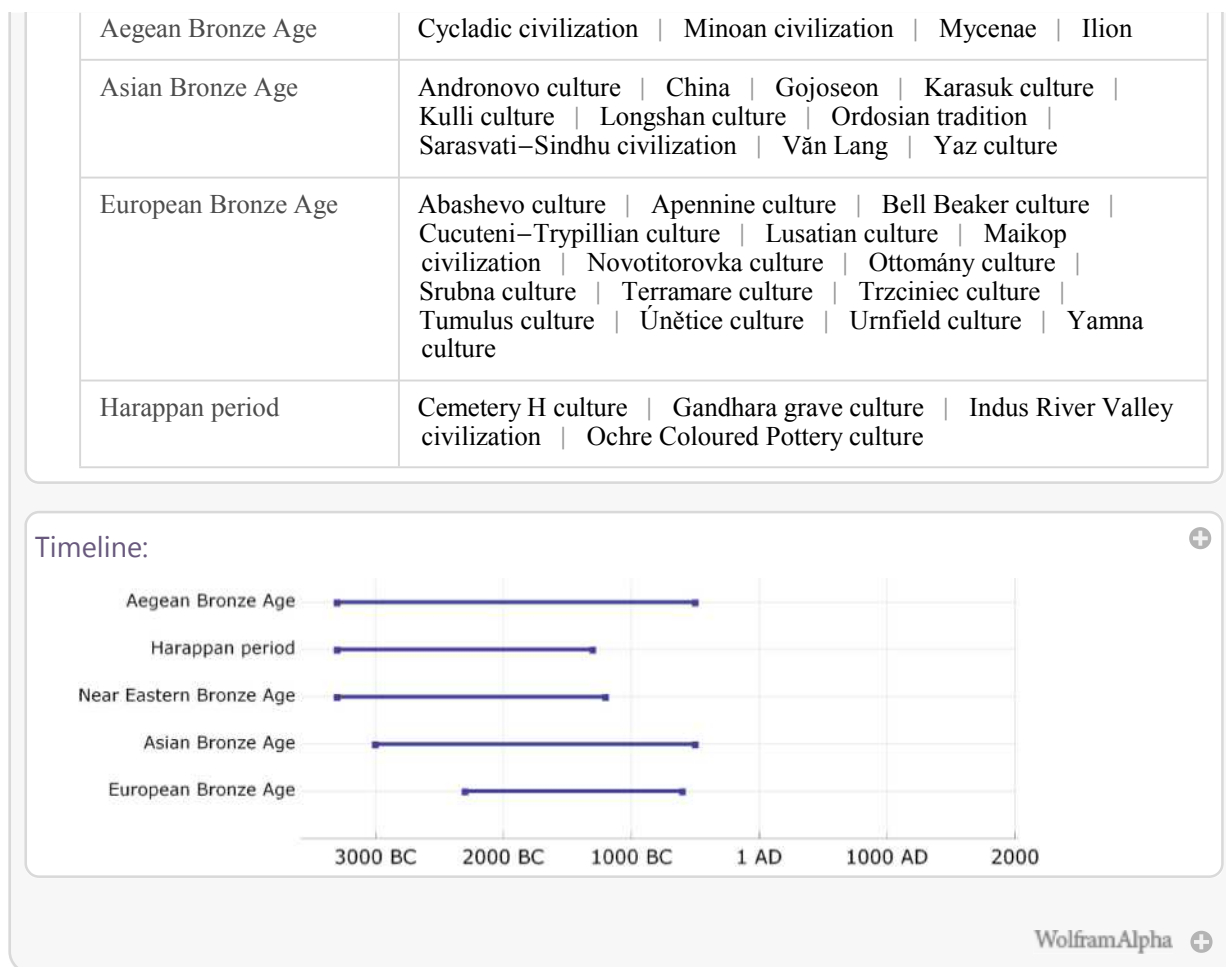
Members:

Near Eastern Bronze Age | Aegean Bronze Age |
Asian Bronze Age | European Bronze Age | Harappan period

Basic information:

	start date	end date
Near Eastern Bronze Age	≈ 3300 BC	≈ 1200 BC
Aegean Bronze Age	≈ 3300 BC	≈ 500 BC
Asian Bronze Age	≈ 3000 BC	≈ 500 BC
European Bronze Age	≈ 2300 BC	≈ 600 BC
Harappan period	≈ 3300 BC	≈ 1300 BC

	areas involved
Near Eastern Bronze Age	Akkadian Empire Amorite Kingdom United Kingdom of Israel and Judah Aramaean culture Assyrian Empire Kingdom of Arzawa Old Babylonian Empire Canaan Ebla Egyptian Empire Elam Eridu Land of the City of Hattusa Hurrians Kadesh Kassite Empire Kulli culture Mitanni State Oxus civilization Phoenicia Shasu Sumer Ilion Ugarit Ur Yamkhad



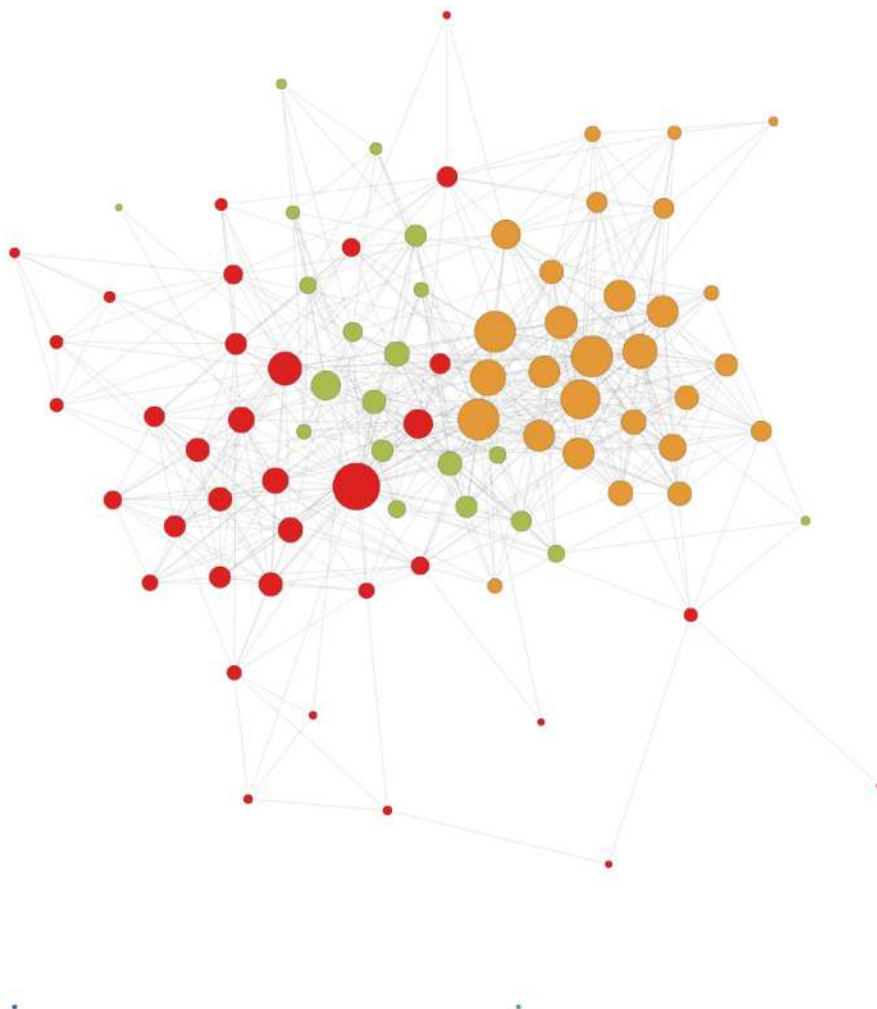
Luštění písem a šifer - námět na SOČ

Zajímavým námětem pro žáky může být luštění písem. Na to je možné využít příkaz `Classify`, který umožňuje kategorizovat zadané znaky/obrázky a pod.

Classify

Sociální síť

```
mojesit = SocialMediaData["Facebook", "FriendNetwork"]
```



A k čemu nám to je

Rozpoznávání buněk teroristických skupin

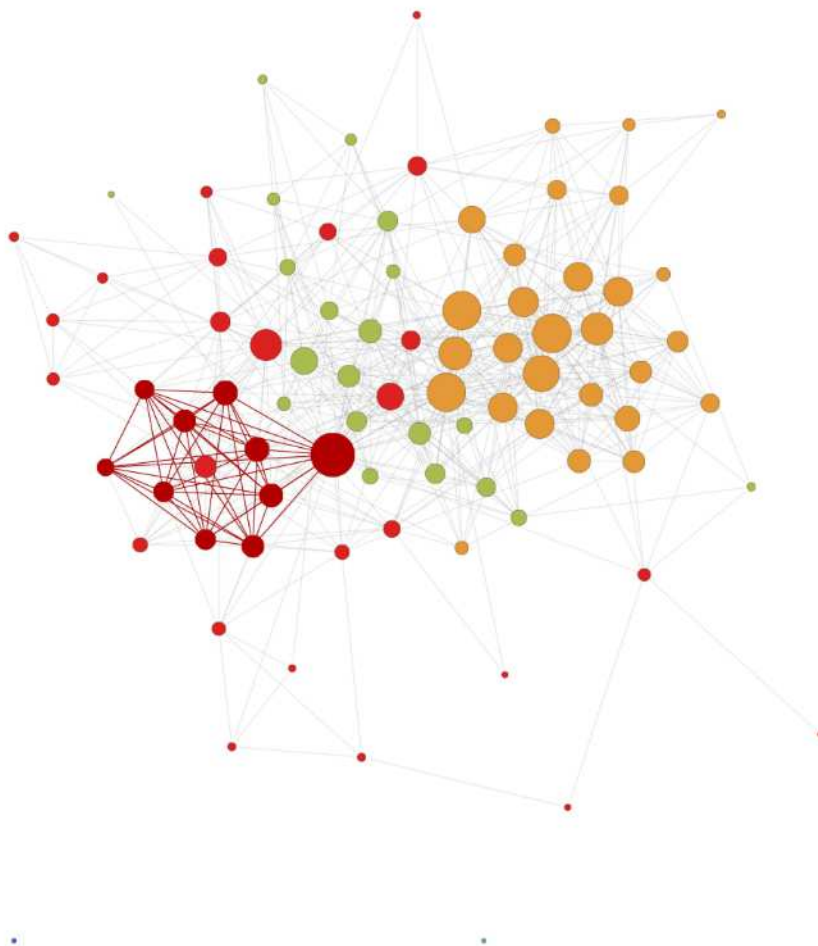
example/CliquesAndCohesiveGroups

[http://cs.wikipedia.org/wiki/Klika_\(sociologie\)](http://cs.wikipedia.org/wiki/Klika_(sociologie))

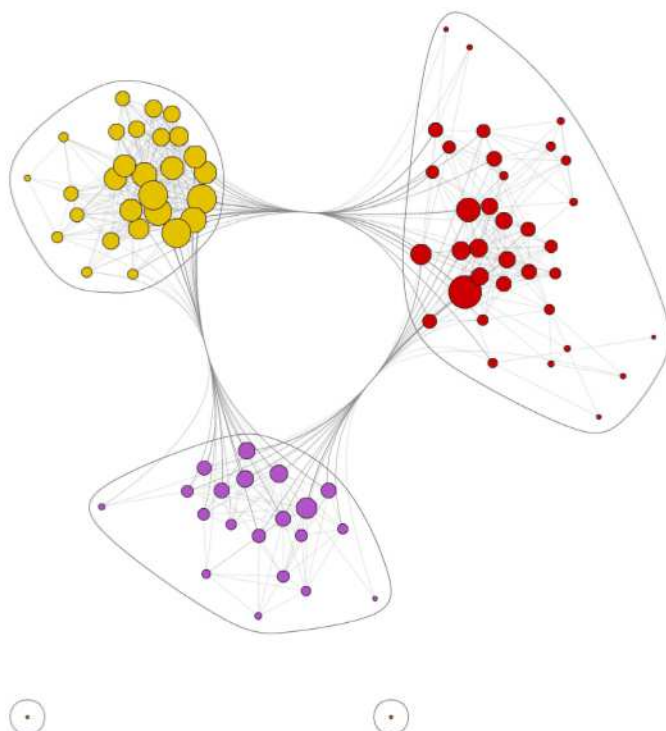
```

FindClique[mojesit, 30]
HighlightGraph[mojesit, Subgraph[mojesit, %]]
{ {Karel Novotný, Majdaléna Havlínová, Beata Fišerová,
  Arty Masalyga, Michaela Janulíková, Frenky Bartoníček,
  Kryštof Štofi Čada, Tomáš Prejza, Honza Hloušek, Niki Ortová} }

```




```
CommunityGraphPlot[mojesit, FindGraphCommunities[mojesit]]
```



Internetová bezpečnost a sociální sítě - aneb zjistěte koho opravdu znáte...

Je zajímavé podívat se na vlastní sociální síť a množství přátel. Ještě lepší je se takto podívat se na síť žáků ve škole v rámci hodin IT, jako prevence stalkingu a dalších možných projevů kyberšikan. Ideální jsou na tuto ukázkou žákyně kolem 14-15 let, které mají obvykle více než 500 přátel, aniž by je většinou znaly. Taková mapa pak může být jeden z ukazatelů, na koho si dát potenciálně pozor.

```
Pick[VertexList[mojesit], DegreeCentrality[mojesit], 0]
```

```
{Stanislav Gottwald, Věra Kerlínová}
```

```
Pick[VertexList[mojesit], DegreeCentrality[mojesit], 0 | 1]
```

```
{Stanislav Gottwald, Věra Kerlínová, Bohuslav Turecký}
```

```
Pick[VertexList[mojesit], DegreeCentrality[mojesit], 0 | 1 | 2]
```

```
{Stanislav Gottwald, Věra Kerlínová, Kikča Márová,  
Aneta Bínová, Bohuslav Turecký, Ivana Kadlecová}
```

Použité zdroje

Nápověda programu Wolfram *Mathematica*

Materiály z webmináře Wolfram Experts Live: New in Mathematica 10

Poděkování

Rád bych na tomto místě poděkoval za možnost realizovat projekt eVIK - výuka, individualizace, koučing, CZ 1.07/1.1.32/02.0132, který na naší škole - Dvořákovu gymnázium a SOŠE, Kralupy nad Vltavou, probíhá v letech 2013 a 2014. Tento projekt je financován Evropským sociálním fondem a rozpočtem České republiky.

Dále bych rád poděkoval i projektu SVV 260098 - Studentský výzkum v oblasti didaktiky fyziky a matematického a počítačového modelování, za možnost hlouběji prohlédnout do zadané problematiky.

