Installing and loading packages for *Programming with Mathematica, An Introduction* (PwM)

From: *Programming with Mathematica: An Introduction*
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Functionality: instructions to install and load PwM packages

What is included

The PwM archive includes notebooks, packages, and data files all in support of the material in the book proper. The following is a listing showing the directory structure and contents of the archive. The two columns give the name of the file and its size (in bytes). Packages are colored gray, notebooks blue, and data files purple.

PwM

Chap01Introduction.m	3673
Chap02Language.m	2859
Chap03Lists.m	3086
Chap04Patterns.m	3833
Chap05Functional.m	14 453
Chap06Procedural.m	2704
Chap07Recursion.m	1900
Chap08Numerics.m	7994
Chap09Strings.m	12 291
Chap10Visualization.m	14 018
Chap11Dynamic.m	4665
Chap12Optimizing.m	3551
Collatz.m	2443
RandomWalks.m	6675
PackageTemplate.m	1458

Chap01Introduction.nb	16 847
Chap02Language.nb	14 932
Chap03Lists.nb	16 442
Chap04Patterns.nb	47 694
Chap05Functional.nb	135 827
Chap06Procedural.nb	15 587
Chap07Recursion.nb	8127
Chap08Numerics.nb	49 802
Chap09Strings.nb	80 717
Chap10Visualization.nb	254 901
Chap11Dynamic.nb	92 248
Chap12Optimizing.nb	64 409
Collatz.nb	12 095
ExercisesAndSolutions.nb	12 704 998
RandomWalks.nb	30 669
PackageTemplate.nb	4806
PwMPackagesReadMe.nb	434 638

Kernel

init.m	421

Data

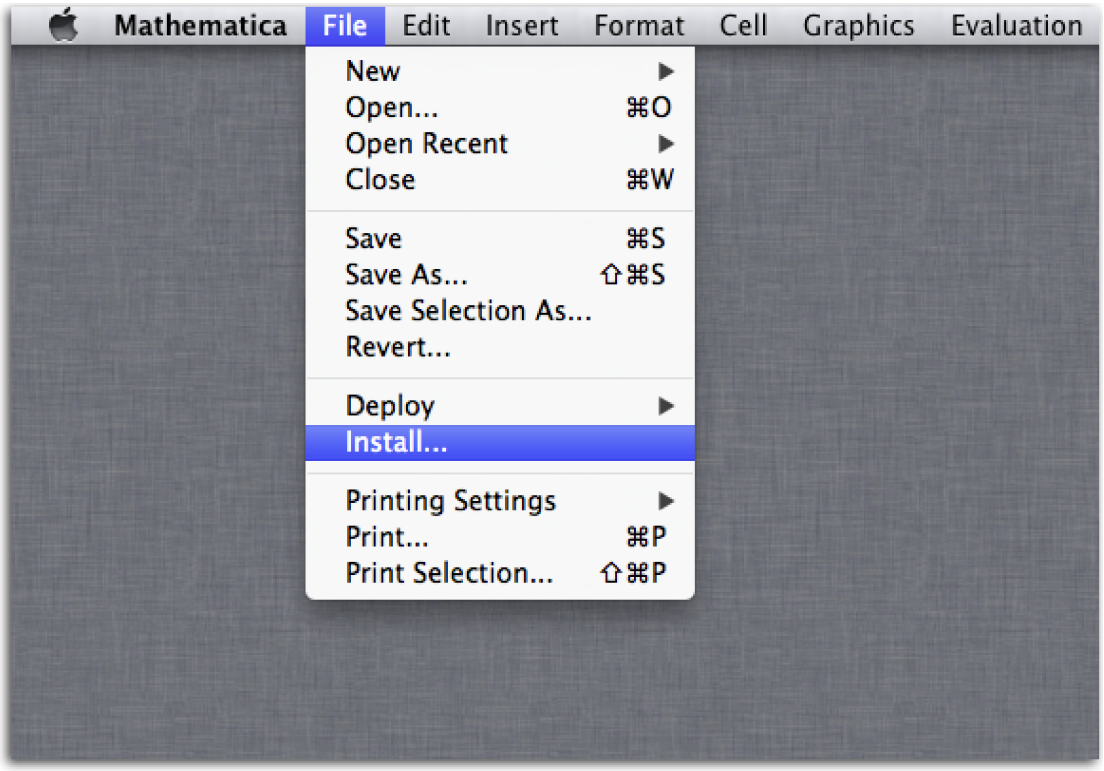
638154522.tar.gz	1 708 558
collectorData.dat	174 805
lew.dat	1398
NED_40638016.zip	2 396 022
NP_001030.2.fasta	754
sampledata.xlsx	3666
StopWords.dat	4224

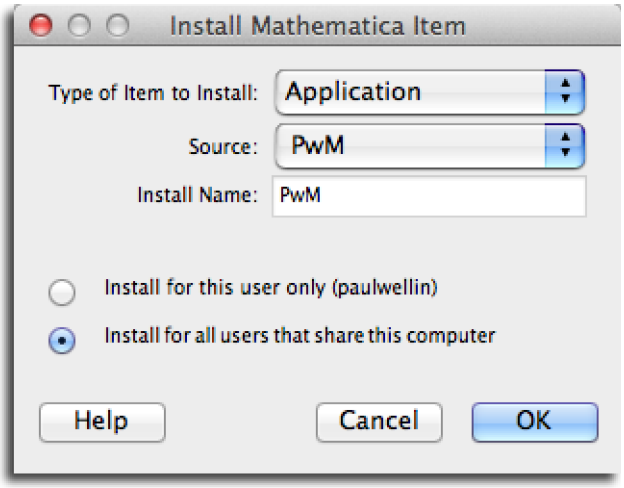
Installing packages

Package location

The packages and other files that come the PwM archive should be placed in one of several special locations on your computer. It is important not to change the structure of the files and directories inside of the PwM directory as package loading, stylesheets, and other functionality will be affected.

You can install the packages manually or using the *Mathematica* front end interface. To do the latter, first unpack the .zip archive that you downloaded and note the location of the resulting PwM folder/directory. Then, in *Mathematica*, go to File ▸ Install… and in the resulting dialog, select Package as the type of item to install; the Source will be From File after which you will need to use your system's finder to locate it; finally, the Install Name should be PwM.





Alternatively, you can drag and drop the PwM archive. Instructions follow and depend upon whether you have administrative rights to your entire computer or not.

Here is where you should drop the PwM directory/folder if you have administrative privileges on your computer and wish to make the packages available to any user on your computer.

```
FileNameJoin[{$BaseDirectory, "Applications"}]
```

```
/Library/Mathematica/Applications
```

To install the package in a user-specific directory, locate it here (where "wellin" will be replaced with *your* login name):

```
FileNameJoin[{$UserBaseDirectory, "Applications"}]
```

```
/Users/wellin/Library/Mathematica/Applications
```

Once you have installed the packages, you can check that they are in the correct location by evaluating `FindFile`. Actually, this shows the location of the Kernel/init.m file inside the PwM archive, but that should be sufficient.

```
FindFile["PwM`"]
```

```
/Library/Mathematica/Applications/PwM/Kernel/init.m
```

Loading packages

Packages included with PwM

The packages that are included with the support materials for PwM can be loaded individually (by chapter) or all at once.

This gives a listing of all the packages in the PwM application.

```
FindFile["PwM`"]
```

```
/Library/Mathematica/Applications/PwM/Kernel/init.m
```

```
FilePrint[%]
```

```
(* Mathematica Init File *)

Get["PwM`Chap01Introduction`"]

Get["PwM`Chap02Language`"]

Get["PwM`Chap03Lists`"]

Get["PwM`Chap04Patterns`"]

Get["PwM`Chap05Functional`"]

Get["PwM`Chap06Procedural`"]

Get["PwM`Chap07Recursion`"]

Get["PwM`Chap08Numerics`"]

Get["PwM`Chap09Strings`"]

Get["PwM`Chap10Visualization`"]

Get["PwM`Chap11Dynamic`"]

Get["PwM`Chap12Optimizing`"]

Get["PwM`RandomWalks`"]

Get["PwM`Collatz`"]
```

Loading an individual package

To load a package associated with an individual chapter, use the full context for that package:

```
<< PwM`Chap04Patterns`
```

If the package loaded properly, you can use it like any other *Mathematica* package. For example, this lists the functions defined in the PwM`Chap04Patterns` package.

```
Names["PwM`Chap04Patterns`*"]
```

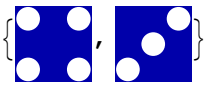
```
{Color, Dice, FixArray, MultiplyCount, SquareMatrixQ, TriangleArea}
```

Get a usage message and try out the function:

```
? Dice
```

Dice[*n*] displays a regular six-sided die with value *n*.

```
{Dice[4], Dice[3]}
```



Loading all packages

If you prefer, you can load all packages associated with PwM.

```
<< PwM`
```

This lists all the currently loaded packages:

```
$Packages
```

```
{PwM`Collatz`, PwM`Common`, PwM`RandomWalks`, PwM`Chap12Optimizing`,
 PwM`Chap11Dynamic`, ComputationalGeometry`, PwM`Chap10Visualization`,
 PwM`Chap09Strings`, PwM`Chap08Numerics`, PwM`Chap07Recursion`,
 PwM`Chap06Procedural`, PwM`Chap05Functional`, PwM`Chap04Patterns`,
 PwM`Chap03Lists`, PwM`Chap02Language`, PwM`Chap01Introduction`,
 GetFEKernelInit`, JLink`, PacletManager`, WebServices`, System`, Global`}
```

Here is a list of the functions defined in one of the packages:

```
Names["PwM`Chap05Functional`*"]
```

```
{AdjacencyStructure, CompositeQ, ExpandFactors, FunctionsWithAttribute,
 FunctionsWithOption, HammingDistance1, HammingDistance2, HammingDistance3,
 HammingDistance4, HammingDistance5, HammingNumber, HammingNumberList, NearTo,
 PerfectSearch, PerfectSearchParallel, PointsetDiameter, PrimeFactorForm,
 RandomColor, RegularGraph, ReplaceElement, RepUnit, SierpinskiTriangle,
 SmithNumberQ, StemPlot, ToGraph, TruthTable, VandermondeMatrix}
```

? FunctionsWithOption

FunctionsWithOption[*opt*] returns a list of all symbols in the System` context that have the option *opt*.

FunctionsWithOption[MaxRecursion]

```
{BodePlot, ContourPlot, ContourPlot3D, DensityPlot, FunctionInterpolation,
 ListStreamDensityPlot, ListStreamPlot, ListVectorDensityPlot, ListVectorPlot,
 ListVectorPlot3D, LogLinearPlot, LogLogPlot, LogPlot, NicholsPlot,
 NIntegrate, NyquistPlot, ParametricPlot, ParametricPlot3D, Plot, Plot3D,
 PolarPlot, RegionPlot, RegionPlot3D, RevolutionPlot3D, RootLocusPlot,
 SingularValuePlot, SmoothDensityHistogram, SmoothHistogram, SmoothHistogram3D,
 SmoothKernelDistribution, SphericalPlot3D, StreamDensityPlot, StreamPlot,
 VectorDensityPlot, VectorPlot, VectorPlot3D, WaveletPhi, WaveletPsi}
```