

```
SetDirectory["C:\\drorbn\\AcademicPensieve\\Projects\\WKO4"]
C:\\drorbn\\AcademicPensieve\\Projects\\WKO4
```

Make

```
Make::usage =
  "Make[target, sources, Hold[action]] makes a target, or a list of targets,
  given sources, or a list of sources, in
  the style of the unix 'make' command.";
Make[target_String, sources_, action_Hold] :=
  Make[Evaluate@{target}, sources, action];
Make[target, source_String, action__Hold] :=
  Make[target, Evaluate@{source}, action];
Make[target_List, sources_List, action_Hold] := Module[{},
  If[
    (And @@ ((FileType[#] != None) & /@ sources)) &&
    Or[
      Or @@ ((FileType[#] === None) & /@ targets),
      Min[AbsoluteTime[FileDate[#]] & /@ targets] <
      Max[AbsoluteTime[FileDate[#]] & /@ sources]
    ],
    Print["Making ", targets, " ..."];
    ReleaseHold[action]
  ],
  ];
```

WordCloud

```
sources = {"WKO4.tex", "abstract.tex", "intro.tex", "El.tex", "comp.tex"};
target = "WordCloud.png";

MakeWC[] := Module[{words, dict},
  words = Flatten[TextWords[ReadString[#]] & /@ sources];
  dict = Complement[
    DeleteStopwords[DictionaryLookup[]],
    {"begin", "end", "left", "right", "equation", "item", "em"}
  ];
  words = Select[words, MemberQ[dict, #] &];
  WordCloud[words, ImageSize -> 400]
]
```


Output

```
{
  "TitleNotes" ->
  StringJoin["<div style=\"clear: right; float: right; padding: 8px; width:
    400px;\"><img width=400px src=Logo.png></div>This is the construction
    / computation page for my paper <b>Finite Type Invariants of
    w-Knotted Objects IV: Some Computations</b> (<a href=WKO4.pdf>PDF
    here</a>). <p>Click to download the main Mathematica packages
    used within: <a href=FreeLie.m><tt>FreeLie.m</tt></a> and <a
    href=AwCalculus.m><tt>AwCalculus.m</tt></a>. <p><b>Abstract.</b> ",
  Import["abstract.txt"],
  "\n<p><b>Front page links:</b> <a
    href=WKO4.pdf>WKO4.pdf</a>, <a href=FreeLie.m><tt>FreeLie.m</tt></a>,
    <a href=AwCalculus.m><tt>AwCalculus.m</tt></a>, ",
  Riffle[
    StringReplace[
      " NB (<a href=NB.nb>nb</a>, <a href=nb/NB.pdf>pdf</a>)",
      "NB" -> #
    ] & /@ StringSplit[
      "WKO4Session bch 817 Borromean VCapSolution KVDirect dims dims1 Phi"],
      ",\n"
    ],
    ".\n<p>"
  ]
}
{TitleNotes ->
  <div style="clear: right; float: right; padding: 8px; width: 400px;"><img
  width=400px src=Logo.png></div>This is the construction /
  computation page for my paper <b>Finite Type Invariants of
  w-Knotted Objects IV: Some Computations</b> (<a href=WKO4.pdf>PDF
  here</a>). <p>Click to download the main Mathematica packages
  used within: <a href=FreeLie.m><tt>FreeLie.m</tt></a> and <a
  href=AwCalculus.m><tt>AwCalculus.m</tt></a>. <p><b>Abstract.</b>
  In the previous three papers in this series, [<a
  href=http://drorbn.net/AcademicPensieve/Projects/WKO1/>WKO1</a>]-[<a
  href=http://drorbn.net/AcademicPensieve/Projects/WKO3/>WKO3</a>],
  Z.&nbsp;&nbsp;&nbsp;Dancso and I studied a certain theory of "homomorphic expansions" of
  "w-knotted objects", a certain class of knotted objects in 4-dimensional
  space. When all layers of interpretation are stripped off, what remains
  is a study of a certain number of equations written in a family of spaces
   $\mathcal{A}^w$ , closely related to degree-completed free Lie algebras
```

and to degree-completed spaces of cyclic words.

<p>

The purpose of this paper is to introduce mathematical and computational tools that enable explicit computations (up to a certain degree) in these \mathcal{A}^w spaces and to use these tools to solve the said equations and verify some properties of their solutions, and as a consequence, to carry out the computation (up to a certain degree) of certain knot-theoretic invariants discussed in [[WK01](http://drorbn.net/AcademicPensieve/Projects/WK01/)]-[[WK03](http://drorbn.net/AcademicPensieve/Projects/WK03/)]

and in my related paper [\[KBH\]](http://www.math.toronto.edu/~drorbn/papers/KBH/).

<p>Front page links: WK04.pdf,</p>

<tt>FreeLie.m</tt>,< a href=AwCalculus.m><tt>AwCalculus.m</tt>,</p>

WK04Session.nb,< a href=nb/WK04Session.pdf>WK04Session.pdf,</p>

bch.nb,< a href=nb/bch.pdf>bch.pdf,</p>

817.nb,< a href=nb/817.pdf>817.pdf,</p>

Borromean.nb,< a href=nb/Borromean.pdf>Borromean.pdf,</p>

VCapSolution.nb,< a href=nb/VCapSolution.pdf>VCapSolution.pdf,</p>

KVDirect.nb,< a href=nb/KVDirect.pdf>KVDirect.pdf,</p>

dims.nb,< a href=nb/dims.pdf>dims.pdf,</p>

dims1.nb,< a href=nb/dims1.pdf>dims1.pdf,</p>

Phi.nb,< a href=nb/Phi.pdf>Phi.pdf.</p>

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