```
<head>
    <meta charset="utf-8">

    <title>Why R</title>

    <meta name="description" content="A epistemological answer to the obvious question. Why would anyone
    <meta name="author" content="Andy Choens, MSW">
    <meta name="apple-mobile-web-app-capable" content="yes" />
    <meta name="apple-mobile-web-app-status-bar-style" content="black-translucent" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0, maximum-scale=1.0, user-scalab

    <link rel="stylesheet" href="css/reveal.css">
    <link rel="stylesheet" href="css/theme/solarized.css" id="theme">

    <!-- Code syntax highlighting -->
    <link rel="stylesheet" href="lib/css/zenburn.css">

    <!-- Printing and PDF exports -->
    <script>
     var link = document.createElement( 'link' );
     link.rel = 'stylesheet';
     link.type = 'text/css';
     link.href = window.location.search.match( /print-pdf/gi ) ? 'css/print/pdf.css' : 'css/print/paper
     document.getElementsByTagName( 'head' )[0].appendChild( link );
    </script>

    <!--[if lt IE 9]>
    <script src="lib/js/html5shiv.js"></script>
    <![endif]-->
</head>

<body>

    <div class="reveal">

        <!-- Any section element inside this container is displayed as a slide -->


        <div class="slides">

            <!-- Title Slide ######################################################## -->
            <section>
                <div style="display:inline-block; margin:0 auto; float:left; width:50%;">
                    <h1>Why</h1>
                </div>
                <div style="display:inline-block; margin:0 auto; float:right; width:50%;">
                    <img src="svg/r.svg" height="75%" width="75%">
                    <p>
                        <small>Presented by: Andy Choens, MSW</small>
                    </p>
                </div>
                <aside class="notes">
                    <p>According
                        to <a href="https://en.wikipedia.org/wiki/R_%28programming_language%29">Wikiped
```

```
          <code>
R is a programming language and software environment for
statistical computing and graphics. The R language is
widely used among statisticians and data miners for
developing statistical software and data
analysis. Polls, surveys of data miners, and studies of
scholarly literature databases show that R's popularity
has increased substantially in recent years.
          </code>
          <p>
              This is not a WHY NOT SAS presentation. This is a Why R
              presentation. By the end of the presentation, I hope to
              have demonstrated that R is a relevant language in the
              work we are doing today and will be even more relevant
              in years to come.
          </p>
      </aside>
  </section>

  <!-- URLs to Remember ------------------------------------- -->
  <section>
      <h2>URLs To Remember:</h2>
      <ol start=0>
          <li><a href="http://choens.github.io/why-r/">http://choens.github.io/why-r/</a></li
          <li><a href="https://github.com/choens/why-r/">https://github.com/choens/why-r/</a>
          <li><a href="http://cran.r-project.org/">http://cran.r-project.org/</a></li>
      </ol>
      <aside class="notes">
          <ul>
              <li>
                  The 1st link will let you see the presentation, as
                  it was presented here today.
              </li>
              <li>
                  The 2nd link will let you see all of the underlying
                  code used in today's presentation.
              </li>
              <li>
                  Later in the presentation, I will show some demo
                  output files and demo code files. These resources can be
                  found in the examples folder on GitHub which you can
                  access by following the 2nd link.
              </li>
              <li>
                  You are free to use any of these materials. This
                  presentation, slides, demo files, etc. are licensed
                  under the XXXX license.
              </li>
              <li>
                  Any time you see text in this color of
                  blue. It is a link. If you click it,
                  you will go somewhere fun.
              </li>
          </ul>
```

```
    </aside>
</section>

<!-- Bad Reasons to Learn / Use R ---------------------------------- -->
<section>
    <h2>Bad Reasons To Learn / Use R </h2>
    <br/>
    <div style=" display:inline-block; margin:0 auto; float:left; width:60%;">
        <ul>
            <li class="fragment" data-fragment-index="1">Some
                guy with a beard likes it.</li>
            <li class="fragment" data-fragment-index="2">Someone
                on the Internet said it was great.</li>
            <li class="fragment" data-fragment-index="3">You
                read about it somewhere.</li>
        </ul>
    </div>
    <div style="display:inline-block; margin:0 auto; float:right; width:40%;">
        <img src="svg/bad.svg" height="100%" width="100%">
    </div>
    <aside class="notes">
        <ul>
            <li>Advance: 3x</li>
            <li>Let's get this out of the way. There are several bad reasons to use any tool
            <li>In the context of today's discussion, I came up with the following bad reaso
        </ul>
    </aside>
</section>

<!-- Good Reasons to Learn / Use R ------------------------------- -->
<section>
    <h2>Good Reasons to Learn / Use R</h2>
    <br/>
    <div style="display:inline-block; margin:0 auto; float:left; width:40%;">
        <img src="svg/good.svg" height="100%" width="100%">
    </div>
    <div style="display:inline-block; margin:0 auto; float:right; width:60%;">
        <ul>
            <li class="fragment">Ecosystem</li>
            <li class="fragment">Literate Programming</li>
            <li class="fragment">Open Source</li>
            <li class="fragment">Future Opportunities</li>
            <li class="fragment">Don't Take My Word For It</li>
        </ul>
    </div>
    <aside class="notes">
        <ul>
            <li>
                Advance: The ecosystem of tools around R is nothing
                short of AMAZING and it is getting more amazing every
                single day, because ANYONE can contribute to the
                ecosystem.
            </li>
            <li>
```

```
    As of February 2, 2015: <a href="http://cran.r-project.org/web/packages/">CR
    the primary R repository, contains 6,391
    packages. These are peer reviewed packages, developed
    by the community. <a href="http://www.bioconductor.org/packages/release/Bio
    an additional 936 packages. Just let that sink in. And while you do:
</li>
<li>
    I'd like to tell you about where you can use R. You
    can use R from within SAS. You can use R from within
    SPSS. You can use R from within MATLAB, Oracle,
    Postgres, and Vertica. R skills are portable
    skills. Microsoft recently bought the R-based
    consulting firm Revolution Analytics, which could
    result in better integration of R in Microsoft
    produces such as SQL Server or even Office.
</li>
<li>
    Advance: This presentation isn't long enough to take a
    deep dive into Literate Programming, but I do want to
    mention this idea briefly.
</li>
<li>
    Literate programming is an idea from the 1980s, to
    interweave natural language and computer programming
    language. I'll give you concrete examples of this
    later, but the upshot is that it makes it possible to
    write a program that is both self-documenting AND is
    able to compile to a finished, publishable manuscript
    or report. No more cutting and pasting for an hour. No
    more messing up a table because you forgot a decimal
    point on the 9th row of the 3rd column. A
    self-documenting, transparent manuscript that can be
    published.
</li>
<li>
    This is an idea from the 80s. The book, Literate
    Programming was published in 1984. This is an idea
    that is very influential in the R community and is not
    only considered to be current and cutting edge, it is
    something that people are working on today to make it
    easier and faster to produce.
</li>
<li>
    Advance: One good reason to use R is because it is
    open source. Those 7,000+ packages? Only possible
    because R is open source and engages with the
    community.
</li>
<li>
    IBM is unlikely to make integrate SAS into SPSS. They
    are competitors. Besides, owning SAS and SPSS on the
    same machine without a student discout is
    . . . prohibitively expensive. R is considered safe,
    common ground, because it is not a commercial entity.
```

```
            </li>
            <li>
                Advance: A perfectly reasonable, self-interested
                reason to use any tool professionally is because you
                think it will lead to future job opportunities.
            </li>
            <li>
                Knowing how to use SAS effectively is a good way to
                make yourself eligible for a large number of job
                opportunities. Knowing how to use both R <emphasis>and</emphasis>
                SAS effectively makes you relevant to even more future
                job opportunities. Please note: I said AND. Not
                or. Not instead of. I said AND.
            </li>
            <li>
                Advance: But please. Don't take my word for it. See
                what some of these people have to say.
            </li>
        </ul>
    </aside>
</section>

<!-- Section: Ecosystem ========================================== -->
<section>
    <div style="display:inline-block; margin:0 auto; float:left; width:50%;">
        <h1>Ecosystem</h1>
    </div>
    <div style="display:inline-block; margin:0 auto; float:right; width:50%;">
        <img src="svg/r.svg" height="75%" width="75%">
    </div>
    <aside class="notes">
        <ul>
            <li>
                The R ecosystem is vast. Because anyone can alter it,
                extend it or otherwise bend it to their will, they
                have.
            </li>
            <li>
                R is for social science research, genetics,
                econometrics and betting on Football (both types).
            </li>
            <li>
                I'm going to give you a peek into this vast
                ecosystem. But all I can't even begin to explain it
                all. There's too much out there and quite frankly, I
                don't understand half of it.
            </li>
            <li>
                But don't worry. Neither will you.
            </li>
        </ul>
    </aside>
</section>
```

```
<section>
    <h2>Packages</h2>
    <p style="text-align:left">
        The capabilities of R are extended through
        user-created packages, which allow specialized
        statistical techniques, graphical devices (<a href="http://cran.r-project.org/web/pa
        import/export capabilities, reporting tools
        (<a hre="http://cran.r-project.org/web/packages/knitr/index.html">knitr</a>, <a hre
        etc. These packages are developed primarily in
        R, and sometimes in Java, C, C++ and Fortran.
    </p>
</section>
<section>
    <h2>Popular Package Places</h2>
    <ul>
        <li>
            <a href="http://cran.r-project.org/">Comprehensive R Archive Network (CRAN)</a>
        </li>
        <li>
            <a href="http://www.bioconductor.org/">Bioconductor</a>
        </li>
        <li>
            <a href="http://www.omegahat.org/">Omegahat</a>
        </li>
        <li>
            <a href="http://r-forge.r-project.org/">R-Forge</a>
        </li>
        <li>
            <a href="https://github.com/">GitHub</a>
        </li>
    </ul>
    <aside class="notes">
        <ul>
            <li>
                CRAN: The official R
                repositories. Wide ranging collection
                of packages. The growth of packages on
                this repo alone is staggering, and
                only increasing.
            </li>
            <li>
                Bio: Provides packages for the
                analysis of genomic data. Bioconductor
                and R are the two repos I use the
                most. Packages here tend to be of very
                high quality, are updated, and well
                accepted by the broader
                community. There are over 7,000
                packages at these two sites alone.
            </li>
            <li>
                Omegahat: Older repo. Predates
                CRAN. Has more bleeding edge
                packages. For example, there is a
```

```
                package to integrate R and Firefox,
                allowing you to run R within a
                webpage. Some duplication with CRAN.
            </li>
            <li>
                R-Forge: Clone of the venerable Source
                Forge site. This page is mostly
                packages not yet approved for
                distribution via CRAN, or is the beta
                version of the next release. Use most
                of this at your own risk. Some very
                interesting packages.
            </li>
            <li>
                GH: OMG. There are over 20,000 public
                repositories on GitHub, which appear
                to be R source code. Some of these are
                packages developed by the author for
                personal use. Some are analyses. Some
                are for various classes. The diversity
                here is incredible. I have no idea how
                to count only those repos on GH that
                are packages. I looked around, and
                nobody else does either.
            </li>
        </ul>
    </aside>
</section>

<!-- To Infinity and Beyond! ------------------------------ -->
<section>
    <h2>To Infinity & Beyond!</h2>
    <img src ="img/fig_8_cran.png" width="640" style="position: relative; top:-150px; z-inde
    <p style="position: relative; top:-175px; z-index:+1;">
        Source:
        <a href="http://r4stats.com/articles/popularity/">r4stats.com/articles/popularity/<
    </p>
    <aside class="notes">
        <ul>
            <li>
                I want to plug the r4stats page, which is where I
                got a lot of the information I used in this
                presentation. The amount of information there is
                staggering and quite frankly somewhat obsessive.
            </li>
            <li>
                R-Core is a powerful stats package. But I don't use
                R because of the brilliance of R-Core. I use R
                because of the packages.
            </li>
            <li>
                In 2009 John Fox wrote some code that calculates the
                number of R packages available on CRAN for each
                release of R. This image does not include
```

```
                Bioconductor or any other R package
                repositories. Just the official CRAN packages.
            </li>
            <li>
                For those keeping track at home, the super-imposed
                model is a quadratic parabola. More importantly is
                the continuing, rapid rise.
            </li>
            <li>
                This single image is quite possibly one of the best
                reasons to use R and one of the best reasons to run
                for the hills. With this many options available,
                there is duplication. Some packages are
                brilliant. Some are bizarre. Some are probably
                downright stupid. To leverage this incredible
                resource takes time and it takes expertise.
            </li>
        </ul>
    </aside>
</section>

<!-- Two Examples ----------------------------------------- -->
<section>
    <h2>Packages Examples</h2>
    <table style="width:100%;">
        <tr>
            <td style="width:33.3%; text-align:center;">
                <h3><a href="http://cran.r-project.org/web/packages/dplyr/index.html">dplyr<
            </td>
            <td style="width:33.3%; text-align:center;">
                <h3><a href="http://cran.r-project.org/web/packages/ggplot2/index.html">ggp
            </td>
            <td style="width:33.3%; text-align:center;">
                <h3><a href="http://cran.r-project.org/web/packages/sqlutils/index.html">sq
            </td>
        </tr>
        <tr>
            <td>
                <small>A fast, consistent tool for
                working with data frame like objects,
                both in memory and out of memory.</small>
            </td>
            <td>
                <small>An implementation of the
                grammar of graphics in R. It combines
                the advantages of both base and
                lattice graphics: conditioning and
                shared axes are handled automatically,
                and you can still build up a plot step
                by step from multiple data sources. It
                also implements a sophisticated
                multidimensional conditioning system
                and a consistent interface to map data
                to aesthetic attributes.</small>
```

```
            </td>
            <td>
                <small>This package provides utilities
                for working with a library of SQL
                files.</small>
            </td>
        </tr>
    </table>
    <aside class="notes">
        <ul>
            <li>
                I'm not even going to pretend like I know what some
                of these packages do. Yes. There is actually a
                package on CRAN dedicated to fisheries science. And,
                I genuinely have NO idea what the ChIPpeakAnno
                package does. But with over 7,000 packages, even a
                social worker like me is bound to find something
                useful.
            </li>
</section>

<!-- Diverse Examples ------------------------------------- -->
<section>
    <h2>Package ????</h2>
    <table style="width:100%;">
        <tr>
            <td style="width:50%; text-align:center;">
                <h3><a href="http://cran.r-project.org/web/packages/kobe/index.html">kobe-pa
            </td>
            <td style="width:50%; text-align:center;">
                <h3><a href="http://www.bioconductor.org/packages/release/bioc/html/ChIPpeal
            </td>
        </tr>
        <tr>
            <td>
                <small>The tuna Regional Fisheries Management
                    Organisations (tRFMOs) use a common framework for
                    providing scintific advice, i.e. the Kobe II
                    Framework. This is based on maintaining fishing
                    mortal- ity below FMSY and stock biomass above
                    BMSY. This package provides methods for summarising
                    results from stock assessments and Management
                    Strategy Evaluations in the Kobe format.</small>
            </td>
            <td>
                <small>The package includes functions to retrieve
                    the sequences around the peak, obtain enriched Gene
                    Ontology (GO) terms, find the nearest gene, exon,
                    miRNA or custom features such as most conserved
                    elements and other transcription factor binding
                    sites supplied by users. Starting 2.0.5, new
                    functions have been added for finding the peaks with
                    bi-directional promoters with summary statistics
                    (peaksNearBDP), for summarizing the occurrence of
```

```
                    motifs in peaks (summarizePatternInPeaks) and for
                    adding other IDs to annotated peaks or enrichedGO
                    (addGeneIDs). This package leverages the biomaRt,
                    IRanges, Biostrings, BSgenome, GO.db, multtest and
                    stat packages.</small>
                </td>
            </tr>
        </table>
        <aside class="notes">
            <ul>
                <li>
                    I'm not even going to pretend like I know what some
                    of these packages do. Yes. There is actually a
                    package on CRAN dedicated to fisheries science. And,
                    I genuinely have NO idea what the ChIPpeakAnno
                    package does. But with over 7,000 packages, even a
                    social worker like me is bound to find something
                    useful.
                </li>
</section>

<!-- Commercial Support ------------------------------------ -->
<section>
    <h2>Commercial Support</h2>
    <div style="display:inline-block; margin:0 auto; float:left; width:33%;">
        <h3>Programming Languages</h3>
        <ul>
            <small>
                <li>C</li>
                <li>Java</li>
                <li>JMP</li>
                <li>Mathematica</li>
                <li>MATLAB</li>
                <li>Python</li>
                <li>SAS</li>
                <li>SPSS</li>
                <li>Statistica</li>
                <li>tableau</li>
            </small>
        </ul>
    </div>

    <div style="display:inline-block; margin:0 auto; width:33%;">
        <h3>Database <br/> Vendors</h3>
        <ul>
            <small>
                <li>Hadoop</li>
                <li>Oracle</li>
                <li>PostgreSQL</li>
                <li>Vertica</li>
            </small>
        </ul>
    </div>
```

```
    <div style="display:inline-block; margin:0 auto; float:right; width:33%;">
        <h3>Business Intelligence</h3>
        <ul>
            <small>
                <li>Alteryx</li>
                <li>Jaspersoft</li>
                <li>Oracle Business Intelligence Enterprise Edition</li>
                <li>Pentaho</li>
                <li>SAP (and SAP HANA)</li>
            </small>
        </ul>
    </div>

    <aside class="notes">
        <ul>
            <li>
                R bills itself as the lingua franca of
                statistics. This is done for several
                reasons.
            </li>
            <li>
                It is fun to say lingua franca. Admit
                it. You're rolling your eyes, but you
                know I'm right.
            </li>
            <li>
                More importantly, providers of
                commercial products nearly universally
                support it. You can use R from within
                SAS, SPSS, Oracle and Vertica. In
                fact, it is actually difficult to find
                a statistics package, database or
                business intelligence tool that
                doesn't support R.
            </li>
            <li>
                That means R skills are portable. Even
                in an office that uses SPSS, it is
                possible to leverage R skills. If you
                later move to a job that uses SAS,
                your SPSS skills aren't very
                useful. Your R skills . . . are. Sorry
                for the pun. But I meant to do it.
            </li>
        </ul>
    </aside>
</section>

<!-- Interface Choices ------------------------------------------- -->
<section>
    <h2>Interface Choices</h2>
    <img src="img/screenshots/RStudio.png" style="position: relative; top:-50px; left:-50px
    <img src="img/screenshots/ESS.png" style="position: relative; top:-512px; left:0; z-ind
    <img src="img/screenshots/Eclipse.png" style="position: relative; top:-974px; left:50px
```

```
    <img src="img/screenshots/Rkward.png" style="position: relative; top:-1425px; left:100p
    <aside class="notes">
        <ul>
            <li>
                Most commercial statistics packages
                come with a default interface of
                questionable quality. And if you don't
                like it . . . you can get over
                it. There probably aren't very many
                alternative choices.
            </li>
            <li>
                R is different. In truth, the default
                R interface makes the SAS interface
                look positively utopic. But, because R
                is open source and is the lingua
                franca of the statistics community,
                there are more interfaces available
                for R than you have time to experiment
                with. And more are coming out every
                day.
            </li>
            <li>
                I apologize for the color theme shown
                in all of the screenshots. I like
                it. It is called Solarized and is
                available in most pro-grade
                programming environments these days. I
                tend to use it anywhere / everywhere I
                can. Makes my eyes hurt less. All
                screenshots are taken from one of my
                laptops, and show a section of code I
                wrote in R and Emacs org-mode to
                assess a Kaggle data set about the
                Titanic disaster.
        </ul>
    </aside>
</section>

<section>
    <h2>Interface - RStudio</h2>
    <a href="img/screenshots/RStudio.png"><img src="img/screenshots/RStudio.png" width="192
    <aside class="notes">
        <ul>
            <li>
                RStudio is becoming THE interface for
                R. It presents the user with an
                interface roughly modeled after
                matlab. It is easy to use, available
                on Windows, Mac and Linux and has an
                active user base. This the interface I
                recommend to people if they don't
                otherwise have an opinion.
            </li>
```

```
        </ul>
    </aside>
</section>

<section>
    <h2>Interface - ESS</h2>
    <a href="img/screenshots/ESS.png"><img src="img/screenshots/ESS.png" width="100%"></a>
    <aside class="notes">
        <ul>
            <li>
                ESS - Emacs Speaks Statistics. This is
                as bare bones as it gets. RStudio is
                an IDE. This is a text editor. In
                truth. It is THE text editor. All
                others are just playing catch-up. Fans
                of other text editors are welcome to
                email me to try to convince me
                otherwise.
            </li>
        </ul>
    </aside>
</section>

<section>
    <h2>Interface - Eclipse/Statet</h2>
    <a href="img/screenshots/Eclipse.png"><img src="img/screenshots/Eclipse.png" width="100
    <aside class="notes">
        <ul>
            <li>
                Eclipse is a popular open-source Java
                IDE that is used by Java developers
                here at DOH. The plugin for R is
                called Statet. Eclipse has plugins
                that allow it to connect to databases
                such as Oracle and Vertica, write Java
                / C applications, program in R, SAS,
                etc.
            </li>
            <li>
                If all you want is an interface for R,
                you are probably better off with
                RStudio. If you want a high-quality
                interface to nearly everything. Use
                Emacs or Eclipse.
            </li>
        </ul>
    </aside>
</section>

<section>
    <h2>Interface - JASP</h2>
    <a href="img/screenshots/JASP.png"><img src="img/screenshots/JASP.png" width="100%"></a
    <aside class="notes">
        <ul>
```

```
            <li>

            </li>
            <li>

            </li>
        </ul>
    </aside>
</section>


<!-- Literate Programming ---------------------------------------- -->
<section>
    <div style="display:inline-block; margin:0 auto; float:left; width:50%;">
        <h2>Literate Programming</h2>
    </div>
    <div style="display:inline-block; margin:0 auto; float:right; width:50%;">
        <img src="svg/r.svg" height="75%" width="75%">
    </div>
    <aside class="notes">
        <ul>
            <li></li>
        </ul>
    </aside>
</section>

<!-- MTCARS ------------------------------------------------ -->
<section>
    <h2>MTCARS</h2>
    <p>
        The data was extracted from the 1974 Motor
        Trend US magazine, and comprises fuel
        consumption and 10 aspects of automobile
        design and performance for 32 automobiles
        (1973 - 1974 models).
    </p>
</section>

<section>
  <h2>MTCARS - The Data</h2>

  <small>
    <!--begin.rcode
        data(mtcars)
        kable(head(mtcars))
        end.rcode-->
  </small>

    <aside class="notes">
        <ul>
          <li>
            So, this is the first 10 lines of the
            mtcars data set.
          </li>
```

```
          <li>
            We are going to focus on the mpg, cyl, and
            disp columns.
          </li>
        </ul>
    </aside>
</section>

<!-- Section: Open Source ======================================== -->
<section>
    <div style="display:inline-block; margin:0 auto; float:left; width:50%;">
        <h1>Open Source</h1>
        <h3>Free as in freedom, not beer.</h2>
    </div>
    <div style="display:inline-block; margin:0 auto; float:right; width:50%;">
        <img src="svg/r.svg" height="75%" width="75%">
    </div>
    <aside class="notes">
        <ul>
            <li>
                The term open source means different things to
                different people. In a nutshell, people interpret it
                to mean 'free'.
            </li>
            <li>
                But it means much more than that. Open Source, or more
                formally, Free and Open Source Software aka FOSS, is an
                ideological method for the development, distribution
                and use of software.
            </li>
            <li>
                Yeah. That's a little heavey. We're less than 10
                minutes into this and I'm pulling out the word
                ideology.
            </li>
            <li>
                But it is this ideology that drives so many of the
                practical reasons people cite when choosing to use
                R.
            </li>
            <li>
                The ecosystem, the integration with other tools, the
                veritable multitude of user interface options
                available for R. . . .
            </li>
            <li>
                All of this is made possible by the ideological
                choices made by the R-Core team who lead the
                development of R.
            </li>
            <li>
                I don't think R is competing with SAS and SPSS because
                it is such a beautiful language. It isn't. It is
                competing with them because of the side affects of
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                the decision to develop R in an open, inclusive and
                transparent manner.
            </li>
    </aside>
</section>

<!-- Popular Examples: Open Source ------------------------------- -->
<section>
    <h2>Open Source Is Everywhere:</h2>
    <table>
        <tr>
            <td><h3>FOSS:</h3></td>
            <td>
                <img src="img/logos/firefox.png" height="128px"
                     width="128px" style="vertical-align:middle;">
            </td>
            <td>
                <img src="img/logos/adium.png" height="128px"
                     width="128px" style="vertical-align:middle;">
            </td>
            <td>
                <img src="img/logos/java.png" height="128px" width="128px"
                     style="vertical-align:middle;">
            </td>
            <tr>
                <td></td>
                <td style="text-align:center;"><a href="https://filezilla-project.org/">Fil
                <td style="text-align:center;"><a href="https://www.adium.im/">Adium</a></t
                <td style="text-align:center;"><a href="https://www.java.com/en/download/">
            </tr>
            <tr>
                <td><h3>Based On:</h3></td>
                <td>
                    <img src="img/logos/chrome.png" height="128px"
                         width="128px" style="vertical-align:middle;">
                </td>
                <td>
                    <img src="img/logos/safari.jpg" height="128px"
                         width="128px" style="vertical-align:middle;">
                </td>
                <td>
                    <img src="img/logos/android.png" height="128px"
                         width="128px" style="vertical-align:middle;">
                </td>
            </tr>
            <tr>
                <td></td>
                <td style="text-align:center;"><a href="http://www.google.com/chrome/">Chro
                <td style="text-align:center;"><a href="https://www.apple.com/safari/">Safa
                <td style="text-align:center;"><a href="https://www.android.com/">Android</
            </tr>
            <tr>
            </tr>
    </table>
```

```
    <aside class="notes"></aside>
</section>

<!-- DOH: Open Source ------------------------------------------- -->
<section>
    <h2>Even @ DOH:</h2>
    <table>
        <tr>
            <td><h3>FOSS:</h3></td>
            <td>
                <img src="img/logos/filezilla.png"
                     height="128px" width="128px" style="vertical-align:middle;">
            </td>
            <td>
                <img src="img/logos/workbench.png" height="128px"
                     width="128px" style="vertical-align:middle;">
            </td>
            <td>
                <img src="img/logos/7-zip.jpg" height="128px"
                     width="128px" style="vertical-align:middle;">
            </td>
        </tr>
        <tr>
            <td></td>
            <td style="text-align:center;"><a href="https://filezilla-project.org/">Filezil
            <td style="text-align:center;"><a href="http://www.sql-workbench.net/">SQL Work
            <td style="text-align:center;"><a href="http://www.7-zip.org/">7-Zip</a></td>
        </tr>
        <tr>
            <td><h3>Based On:</h3></td>
            <td>
                <img src="img/logos/hp-vertica.jpeg" height="128px"
                     width="128px" style="vertical-align:middle;">
            </td>
            <td>
                <img src="img/logos/SAS.jpg" height="128px"
                     width="128px" style="vertical-align:middle;">
            </td>
            <td>
            </td>
        </tr>
        <tr>
            <td></td>
            <td style="text-align:center;"><a href="http://www.vertica.com/">Vertica</a></t
            <td style="text-align:center;"><a href="http://www.sas.com/en_us/home.html">SAS
            <td></td>
        </tr>
        <tr>
        </tr>
    </table>
    <aside class="notes"></aside>
</section>

<!-- Fact: Open Source is everywhere ------------------------------ -->
```

```
<section>
    <h1>Why?</h1>
    <aside class="notes"></aside>
</section>

<!-- The Four Freedoms ------------------------------------------- -->
<section>
    <h2> The Four Freedoms</h2>
    <ol start ="0">
        <li>
            The freedom to run the program for any purpose.
        </li>
        <li>
            The freedom to study how the program works, and change
            it to make it do what you wish.
        </li>
        <li>
            The freedom to redistribute copies so you can help your
            neighbor.
        </li>
        <li>
            The freedom to improve the program, and release your
            improvements (and modified versions in general) to the
            public, so that the whole community benefits.
        </li>
    </ol>
    <br/>
    <img src="img/logos/fsf.org.png">
    <aside class="notes">
        <ul>
            <li>
                <a href="https://en.wikipedia.org/wiki/Free_software">Wikipedia</a>,
                lists the four freedoms associated with Free Software,
                as defined by the Free Sotware Foundation as:
            </li>
            <li>
                Richard Stallman wrote these, thinking about
                software. But, at the time her was working at the AI
                lab at MIT, so science is not an unknown idea to him.
            </li>
            <li>
                I believe these four freedoms fit in well with the
                scientific process.
            </li>
        </ul>
    </aside>
</section>

<!-- The Four Freedoms: Analytic Style ----------------------------- -->
<section>
    <h2> The Four Freedoms: <small>Analytics Style</small></h2>
    <ol start ="0">
        <li>
            The freedom to run the analysis for any purpose.
```

```
        </li>
        <li>
            The freedom to study how the analysis works, and change
            it to make it do what you wish.
        </li>
        <li>
            The freedom to redistribute copies so you can help your
            neighbor.
        </li>
        <li>
            The freedom to improve the analysis, and release your
            improvements (and modified versions in general) to the
            public, so that the whole community benefits.
        </li>
    </ol>
</section>

<!-- Section: Future Opportunities ================================ -->
<section>
    <div style="display:inline-block; margin:0 auto; float:left; width:50%;">
        <h2>Future Opportunities</h2>
    </div>
    <div style="display:inline-block; margin:0 auto; float:right; width:50%;">
        <img src="svg/r.svg" height="75%" width="75%">
    </div>
    <aside class="notes">
        <ul>
            <li></li>
        </ul>
    </aside>
</section>

<!-- Accelerating Growth ----------------------------------------- -->
<section>
    <h2>Accelerating Growth</h2>
    <h3>Indeed.com</h3>
    <br/>
    <div style="width:50%; float:left;text-align: left;">
        <small><code>
      R
      !"R D" !"A R" !"H R" !"R N" !toys !kids !" R Walgreen" !walmart !"HVAC R" !"R Bard"<b
      and ( "biostatistics" or "data analysis" or "data analyst"
            or "epidemiologist"<br/>
            or "healthcare analysis" or "healthcare analyst"<br/>
            or "statistical"<br/>
      )<br/>
      ,SAS
      !"system administrator" !"school age" !sata !firmware !scsi !raid !samsung !scandinav
      and ( "biostatistics" or "data analysis" or "data analyst"
            or "epidemiologist"<br/>
            or "healthcare analysis" or "healthcare analyst"<br/>
            or "statistical"<br/>
      )
        </code></small>
```

```
            </div>
            <div style="width:50%; float:right;">
                <a href="http://www.indeed.com/jobtrends?q=R++%21%22R+D%22+%21%22A+R%22+%21%22H+R%2
                    <img width="540" height="300" src="http://www.indeed.com/trendgraph/jobgraph.png
                </a>
            </div>
            <aside class="notes">
                <ul>
                    <li></li>
                </ul>
            </aside>
        </section>

        <!-- Section: Others Say Similar Things ============================ -->
        <section>
            <div style="display:inline-block; margin:0 auto; float:left; width:50%;">
                <h2>Others Say Similar Things</h2>
            </div>
            <div style="display:inline-block; margin:0 auto; float:right; width:50%;">
                <img src="svg/r.svg" height="75%" width="75%">
            </div>
            <aside class="notes">
                <ul>
                    <li></li>
                </ul>
            </aside>
        </section>


    </div>

  </div>

  <script src="lib/js/head.min.js"></script>
  <script src="js/reveal.js"></script>

  <script>

   // Full list of configuration options available at:
// https://github.com/hakimel/reveal.js#configuration
   Reveal.initialize({
       controls: true,
       progress: true,
       history: true,
       center: true,

       transition: 'slide', // none/fade/slide/convex/concave/zoom

       // Optional reveal.js plugins
       dependencies: [
           { src: 'lib/js/classList.js', condition: function() { return !document.body.classList; } }
           { src: 'plugin/markdown/marked.js', condition: function() { return !!document.querySelecto
           { src: 'plugin/markdown/markdown.js', condition: function() { return !!document.querySelec
           { src: 'plugin/highlight/highlight.js', async: true, condition: function() { return !!docu
```

```
            { src: 'plugin/zoom-js/zoom.js', async: true },
            { src: 'plugin/notes/notes.js', async: true }
        ]
    });

    </script>

</body>
```