

Mini tikz tutorial

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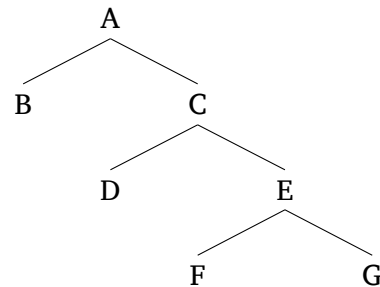
In this short tutorial, I list some basic trees and some basic decorations like different types of arrows. I learned a lot from this phenomenal tutorial by Dr. James Crippen: <https://lingbuzz.net/lingbuzz/003379>. **Most of the code in this tutorial comes from this manual.** Things I learned over the years from <https://tex.stackexchange.com/> are impossible to list and credit.

I claim no credit nor novelty in this tutorial. It just conveniently lists codes that are frequently used. It also provides a guide for students taking syntax courses who may want to learn how to draw trees with `tikz` without having to spend too much time learning its syntax.

Trees and arrows

1. A basic head-initial tree

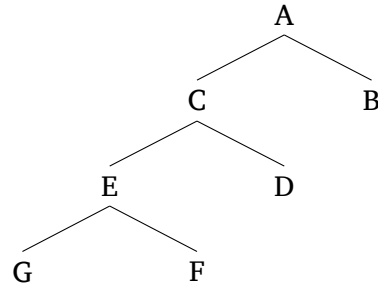
```
\begin{tikzpicture}
  [parent anchor=south,
  align=center,
  level distance=2.25em,
  anchor=north,
  sibling distance=6em,
  child anchor=north]
  \node {A}
  child {node {B}}
  child {node {C}
    child {node {D}}
    child {node {E}
      child {node {F}}
      child {node {G}}}}
  ;
\end{tikzpicture}
```



Adjust the vertical distance between nodes with `level distance=2.25em` and the horizontal distance with `sibling distance=2.25em`.

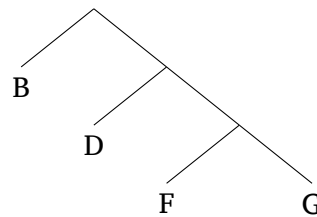
2. A basic head-final tree

```
\begin{tikzpicture}
  [parent anchor=south,
  align=center,
  level distance=2.25em,
  anchor=north,
  sibling distance=6em,
  child anchor=north]
  \node {A}
  child {node {C}
    child {node {E}
      child {node {G}}
      child {node {F}}}}
    child {node {D}}}}
  child {node {B}}
  ;
\end{tikzpicture}
```



3. A tree without labels in branching nodes:

```
\begin{tikzpicture}
  [parent anchor=center,
  align=center,
  level distance=2em,
  anchor=north,
  sibling distance=5em,
  child anchor=north]
  \node {}
  child {node {B}}
  child {
    child {node {D}}
    child {
      child {node {F}}
      child {node {G}}}}}
  ;
\end{tikzpicture}
```



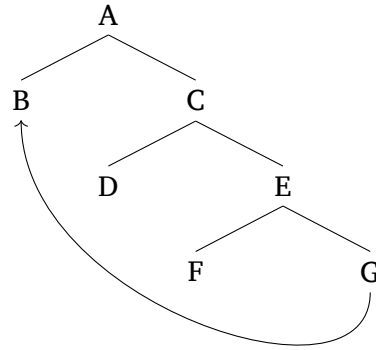
Key specification: parent anchor=center (instead of ‘south’). Then delete node {} in a branching node (cf. the tree with labels in branching nodes).

4. A curved arrow connecting nodes G and B

```

\begin{tikzpicture}
  [parent anchor=south,
  align=center,
  level distance=2.25em,
  anchor=north,
  sibling distance=6em,
  child anchor=north]
  \node {A}
    child {node (b) {B}}
    child {node {C}
      child {node {D}}
      child {node {E}
        child {node {F}}
        child {node (g) {G}}}}
  ;
  \draw[<-] (b) .. controls +(south:7em) and +(south:5em) .. (g);
\end{tikzpicture}

```



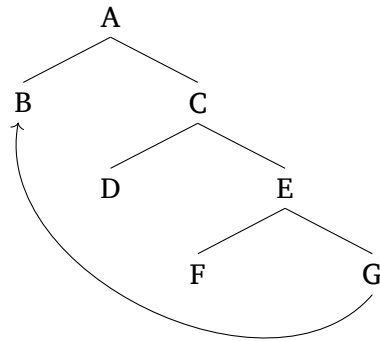
Add labels to the nodes you want to connect with an arrow (e.g. (b) and (g)).

5. Another code for a curved arrow

```

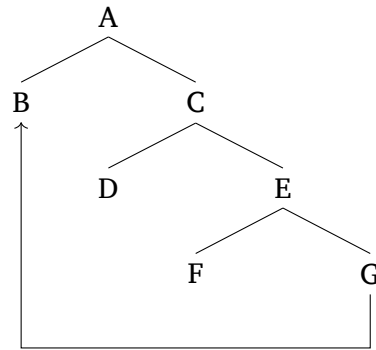
\begin{tikzpicture}
  [parent anchor=south,
  align=center,
  level distance=2.25em,
  anchor=north,
  sibling distance=6em,
  child anchor=north]
  \node {A}
    child {node (b) {B}}
    child {node {C}
      child {node {D}}
      child {node {E}
        child {node {F}}
        child {node (g) {G}}}}
  ;
  \draw[<-] (b) to [bend right=75] (g.south);
\end{tikzpicture}

```



6. An angled arrow connecting B and G

```
\begin{tikzpicture}
  [parent anchor=south,
  align=center,
  level distance=2.25em,
  anchor=north,
  sibling distance=6em,
  child anchor=north]
  \node {A}
    child {node (b) {B}}
    child {node {C}
      child {node {D}}
      child {node {E}
        child {node {F}}
        child {node (g) {G}}}}
  ;
  \draw[<-] (b.south)--+(0,-85pt)-|(g.south);
\end{tikzpicture}
```



7. Other arrow tips and useful commands to be used in draw[...]:

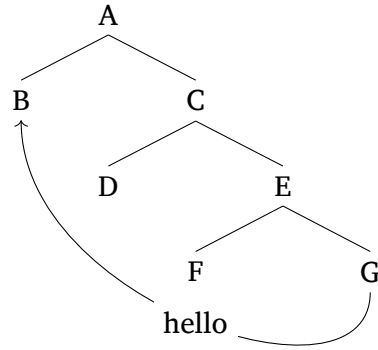
- (a) `*-*` (filled circles)
- (b) `o-o` (circle lines)
- (c) `latex-` (different arrow style)
- (d) `rounded corners=.25em` (rounded corners for angled arrow)
- (e) `dashed` (dashed line instead of solid line)

8. Annotation *hello* added to curved arrow

```

\begin{tikzpicture}
  [parent anchor=south,
  align=center,
  level distance=2.25em,
  anchor=north,
  sibling distance=6em,
  child anchor=north]
  \node {A}
    child {node (b) {B}}
    child {node {C}
      child {node {D}}
      child {node {E}
        child {node {F}}
        child {node (g) {G}}}}
  ;
  \draw[<-] (b) .. controls +(south:7em) and +(south:5em) .. (g)
  node [anchor=center,pos=0.5,fill=white] {hello};
\end{tikzpicture}

```



Instead of *hello*, you can use a symbol like ✕. You will need this package in the preamble:

Here is a comprehensive list of \TeX symbols: <https://tug.ctan.org/info/symbols/comprehensive/symbols-a4.pdf>.

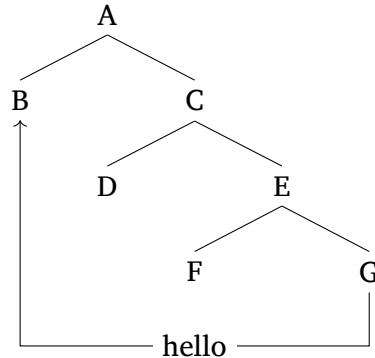
```

\usepackage{pifont}

```

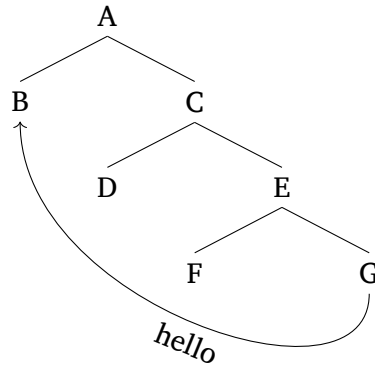
9. Annotation *hello* added to angled arrow

```
\begin{tikzpicture}
  [parent anchor=south,
  align=center,
  level distance=2.25em,
  anchor=north,
  sibling distance=6em,
  child anchor=north]
  \node {A}
    child {node (b) {B}}
    child {node {C}
      child {node {D}}
      child {node {E}
        child {node {F}}
        child {node (g) {G}}}}
  ;
  \draw[<-] (b.south)--+(0,-85pt)-|(g.south)
  node [anchor=center,pos=0.25,fill=white] {hello};
\end{tikzpicture}
```



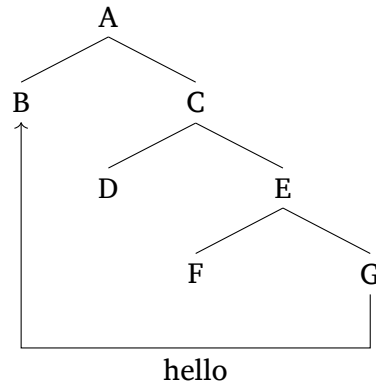
10. Annotation *hello* added beside curved arrow

```
\begin{tikzpicture}
  [parent anchor=south,
  align=center,
  level distance=2.25em,
  anchor=north,
  sibling distance=6em,
  child anchor=north]
  \node {A}
    child {node (b) {B}}
    child {node {C}
      child {node {D}}
      child {node {E}
        child {node {F}}
        child {node (g) {G}}}}
  ;
  \draw[<-] (b) .. controls +(south:7em) and +(south:5em) .. (g)
  node[sloped,midway] {hello};
\end{tikzpicture}
```



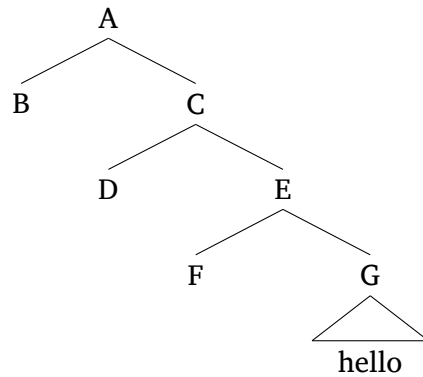
11. Annotation *hello* added below angled arrow

```
\begin{tikzpicture}
  [parent anchor=south,
  align=center,
  level distance=2.25em,
  anchor=north,
  sibling distance=6em,
  child anchor=north]
  \node {A}
    child {node (b) {B}}
    child {node {C}
      child {node {D}}
      child {node {E}
        child {node {F}}
        child {node (g) {G}}}}
  ;
  \draw[<-] (b.south)--+(0,-85pt)-|(g.south)
  node [anchor=north,pos=0.25] {hello};
\end{tikzpicture}
```



12. Triangle

```
\begin{tikzpicture}
  [parent anchor=south,
  align=center,
  level distance=2.25em,
  anchor=north,
  sibling distance=6em,
  child anchor=north]
  \node {A}
    child {node {B}}
    child {node {C}
      child {node {D}}
      child {node {E}
        child {node {F}}
        child {node {G}
          [sibling distance=2em]
          child {coordinate (sideleft)}}
          child {node {hello} edge from parent[draw=none]}
          child {coordinate (sideright)}}}}
  ;
  \draw (sideleft) -- (sideright);
\end{tikzpicture}
```



- Identify the node where you want your triangle, e.g. G:

```
child {node {G}}
```

- Add the code below right before the closing bracket }:

```
child {coordinate (sideleft)}
child {node {TEXT} edge from parent[draw=none]}
child {coordinate (sideright)}
```

- You can control the size of the triangle with [sibling distance=2em], which should be placed before the code for the sides of the triangle.
- Add the following code after the tree to draw a horizontal line as the base of the triangle:

```
\draw (sideleft) -- (sideright);
```

13. Linear representation with arrows

```
\tikzstyle{every picture}+=[remember picture, inner sep=0pt, baseline, anchor=base]%
{}[stuff \tikz\node(b){B}; [more stuff [even more stuff \tikz\node(g){G};]]]
```

```
\begin{tikzpicture}[overlay]
\draw[<-] ([yshift=-.5em]b.south)---(0,-1.5em)-|
([yshift=-.5em]g.south);
\end{tikzpicture}
```

```
[stuff B [more stuff [even more stuff G]]]
```



- The element E in the linear representation you want to connect with an arrow must be placed in this code below. Note the label (e) and the semicolon ; at the end.

```
\tikz\node(e){E};
```

- The code below places the arrow lower down the elements it connects (i.e. it creates vertical space. Use + and - to shift the arrow to the right and left, respectively.

```
[yshift=-.5em]
```

- The code below creates horizontal space. This is particularly useful when the same node is connected by two arrows:

```
[xshift=-.5em]
```


Other useful resources

1. Lining up top of tree with number for numbered examples: use the following code before the tree:

```
\leavevmode\vadjust{\vspace{-\baselineskip}}\newline
```

For example, using gb4e to number examples:

```
\begin{exe}  
  \ex{\leavevmode\vadjust{\vspace{-\baselineskip}}\newline  
  \begin{tikzpicture}  
    [parent anchor=south,  
    align=center,  
    level distance=2.25em,  
    anchor=north,  
    sibling distance=6em,  
    child anchor=north]  
    \node {A}  
    child {node {B}}  
    child {node {C}}  
    ;  
  \end{tikzpicture}}  
\end{exe}
```

2. Introducing symbols and special characters: this document uses a fontspec font. It allows one to input symbols like IPA symbols directly, e.g. [ɸβθðʒʂz].

- This is a useful IPA keyboard: <https://westonruter.github.io/ipa-chart/keyboard/>.
- This website has symbols used in few different writing systems, e.g. Portuguese: <https://portuguese.typeit.org/>.

Compile your file with Xe_{La}TeX!

3. Multiple columns with minipage:

```
\begin{minipage}[t]{.5\textwidth}  
  STUFF IN FIRST COLUMN  
\end{minipage}%  
\begin{minipage}[t]{.5\textwidth}  
  STUFF IN SECOND COLUMN  
\end{minipage}%
```