

TikZ 연습

May 5, 2019

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CHAPTER 1

Tikz 기본 설정

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1. Tikz 사용 용지 설정

■ 사용 용지 설정

```
\usepackage{geometry}

\geometry{top      =10em}
\geometry{bottom   =10em}
\geometry{left     =8em}
\geometry{right    =8em}
\geometry{headheight =4em} % 머리말 설치 높이
\geometry{headsep   =2em} % 머리말의 본문과의 띄우기 크기
\geometry{footskip  =4em} % 꼬리말의 본문과의 띄우기 크기


% paperwidth  = left + width + right (1)
% paperheight = top + height + bottom (2)
% width       = textwidth (+ marginparsep + marginparwidth) (3)
% height      = textheight (+ headheight + headsep + footskip) (4)
```


2. Tikz set

3. Tikz style

CHAPTER 2

기본 도형 그리기

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1. 기본 도형 그리기

■ color

- red
- green
- blue
- cyan
- brown
- yellow
- black
- gray
- white

■ line width

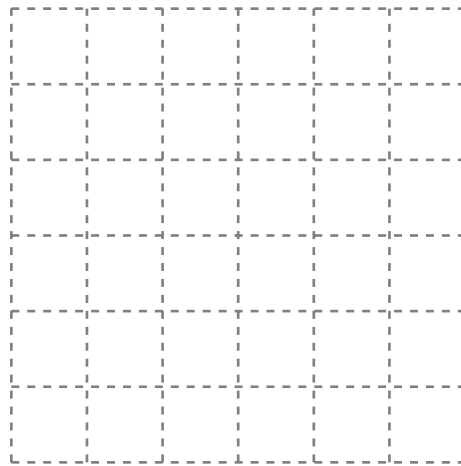
- ultra thick
- very thick
- thick
- semithick
- thin
- very thin
- ultra thin
- line width=

2. grid

■ grid - help line style ;

code

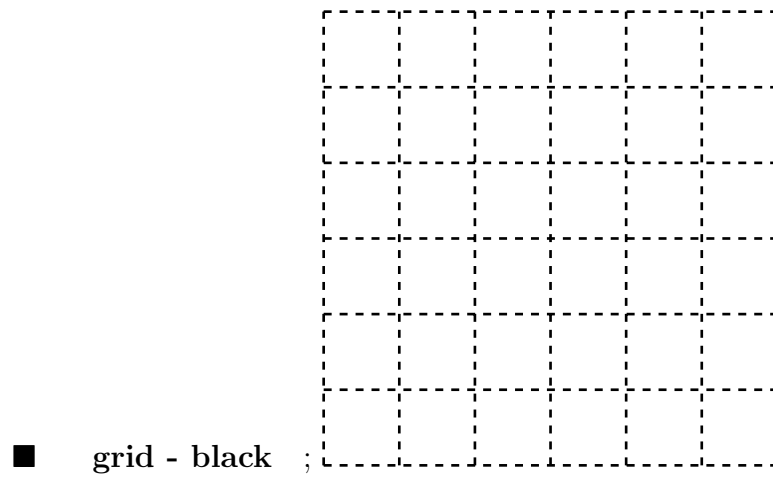
```
\tikzset{help lines/.style={ultra thin, blue!30}};
```



■ grid - gray

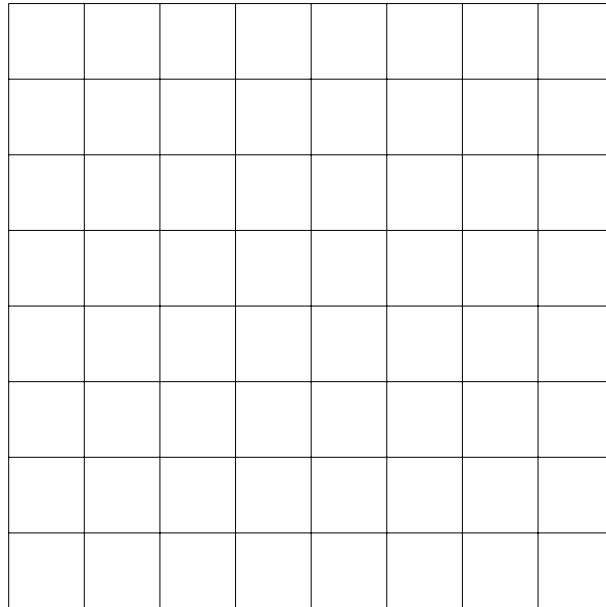
code

```
\tikz {\draw [line width=1pt, dashed, gray]  
(0,0) grid (6,6) }
```



code

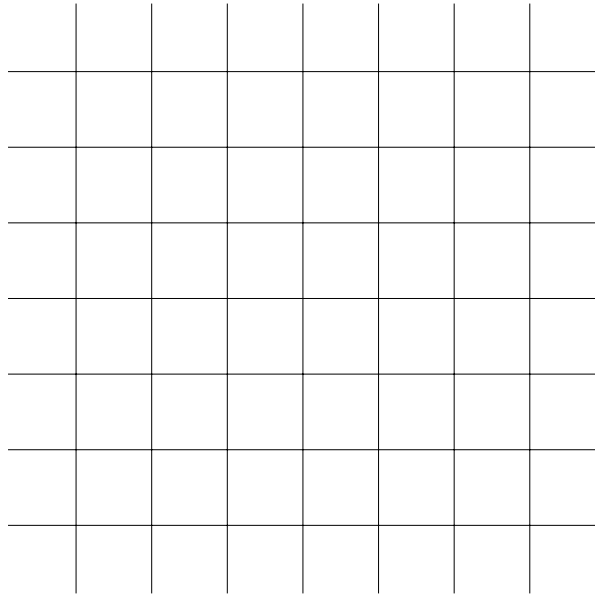
```
\tikzset{help lines/.style={ultra thin, blue!30}};  
\tikz {\draw [line width=1pt, dashed, black]  
(0,0) grid (6,6) }
```

■ Grid

code

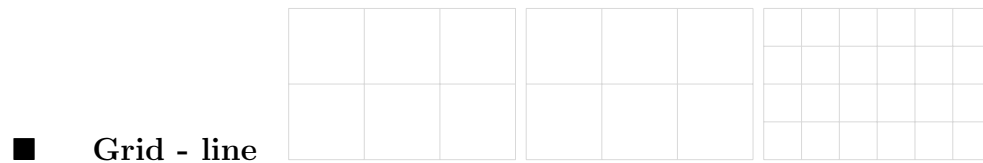
```
\begin{tikzpicture}  
  \draw [step=1cm,black,very thin]  
    (-2,-2) grid (6,6);  
\end{tikzpicture}
```



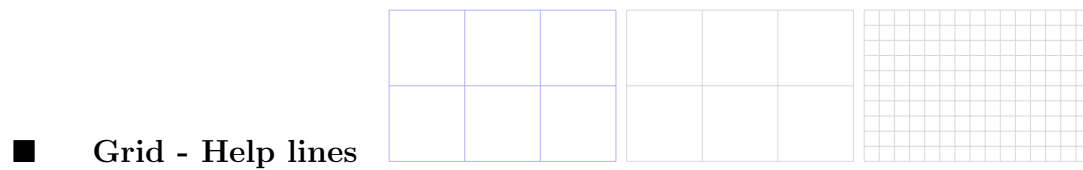
■ Grid - 테두리 삭제

code

```
\begin{tikzpicture}  
  \draw [step=1cm,black,very thin]  
    (-1.9,-1.9) grid (5.9,5.9);  
\end{tikzpicture}
```

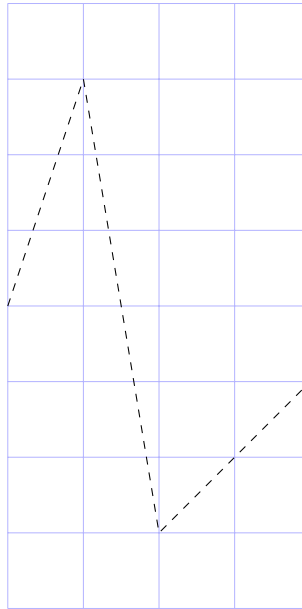
**code**

```
\tikz\draw [line width=0.1pt, gray!30]
(0,0) grid (3,2);
\tikz\draw [line width=0.1pt, gray!30, step=10mm]
(0,0) grid (3,2);
\tikz\draw [line width=0.1pt, gray!30, step=5mm]
(0,0) grid (3,2);
```

**code**

```
\tikz\draw [help lines]
(0,0) grid (3,2);
\tikz\draw [help lines, gray!30]
(0,0) grid (3,2);
\tikz\draw [help lines, gray!30, step=2mm]
(0,0) grid (3,2);
```

3. coordinate Labels

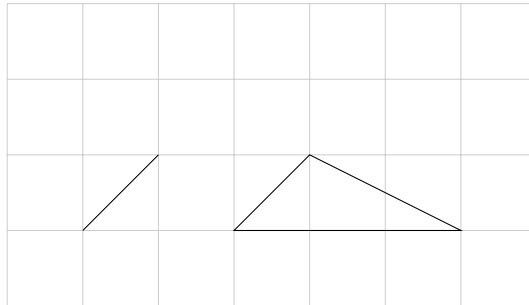


■ coordinate Labels - path

code

```
\begin{tikzpicture}
\draw [help lines] (-2,-4) grid (+2,+4);
\path (-2,+0) coordinate (c1)
      (-1,+3) coordinate (c2)
      (+0,-3) coordinate (c3)
      (+2,-1) coordinate (c4);
\draw [dashed]
(c1) -- (c2) -- (c3) -- (c4);
\end{tikzpicture}
```

4. cycle Operation - 닫힌 도형을 만든다



■ cycle Operation

code

```
\begin{tikzpicture}
\draw [step=1cm,black,very thin, gray!40]
(-1.0,-1.0) grid (6,3);
\draw (0,0) -- (1,1)
(2,0) -- (5,0) -- (3,1) -- cycle;
\end{tikzpicture}
```

5. Horizontal and Vertical Connections

■ Horizontal and Vertical Connections



code

```
\tikz\draw (0.0,0.0) -| (2.0,0.5)  
(1.0,1.0) -| (3.0,0.0);
```

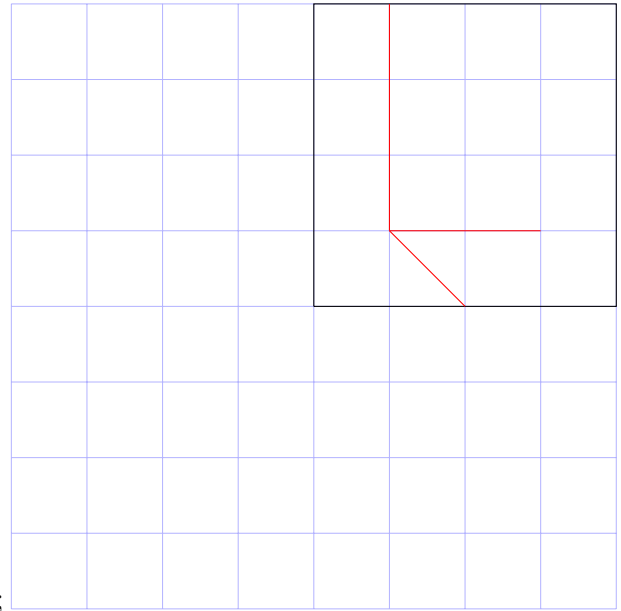
■ Horizontal and Vertical Connections



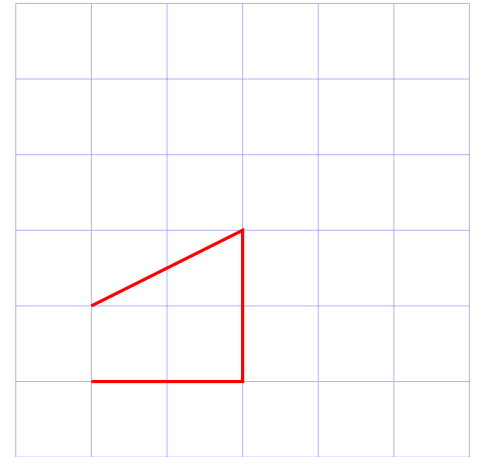
code

```
\tikz\draw (0.0,0.0) -| (2.0,0.5)  
(1.0,1.0) -| (3.0,0.0);
```

6. relative and Incremental Coordinates



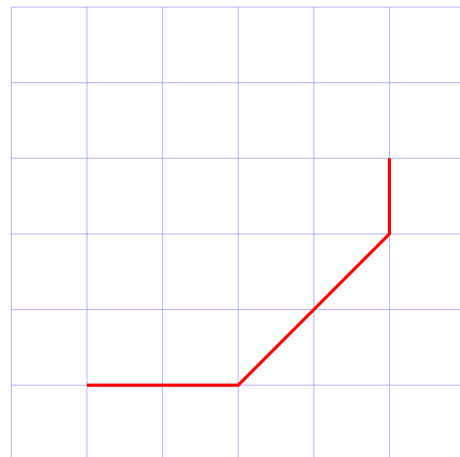
■ relative and Incremental Coordinates ;



- relative Coordinates : 첫번째 점을 원점으로 해서

code

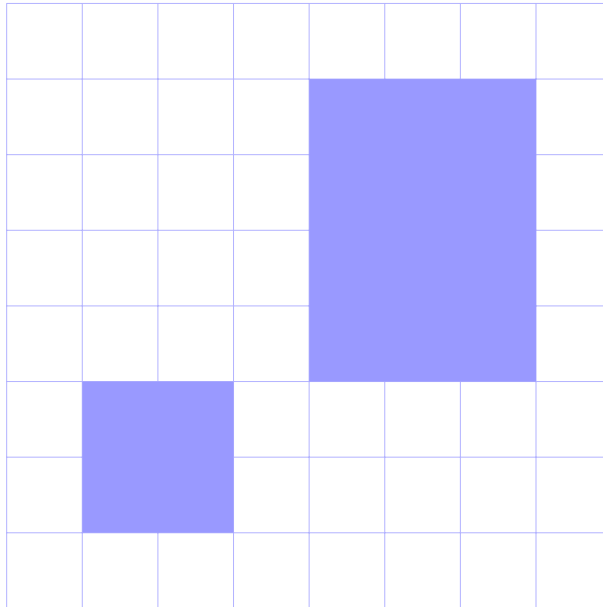
```
\draw (1,1) -- +(2,0) -- +(2,2) -- +(0,1);
```



- Incremental Coordinates : 누적 ;

code

```
\draw (1,1) -- ++(2,0) -- ++(2,2) -- ++(0,1);
```

■ **fill**

code

```
\begin{tikzpicture}
\draw [help lines] (-3,-3) grid (5,5);
\fill[blue!40!white] (-2,-2) rectangle (0,0)
+(1,0) rectangle +(4,4);
\end{tikzpicture}
```

7. node

8. node Labels

9. node Shapes

10. node Shapes split

11. node Option

12. coordinate labels

13. move-To

14. Line-To

■ Line

code

```
\begin{tikzpicture}
\draw (0,0) -- (4,0);
\end{tikzpicture}
```




■ Line

code

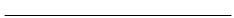
```
\begin{tikzpicture} [color=green]
\draw (0,2) -- (4,2);
\draw [color=red] (0,1) -- (4,1);
\draw [red] (0,0) -- (4,0);
\end{tikzpicture}
```

15. Line width


■ ultra thin 


code


```
\tikz {\draw[ultra thin] (-1.5,0) -- (1.5,0) }
```

■ very thin 

■ thin 

■ line 

■ semithick 

■ thick 


■ very thick 


■ ultra thick 

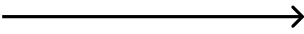
■ line width=1en 

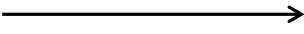
16. Dashed and dotted Lines

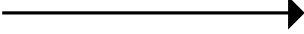
17. Line and arrows

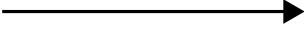
■ $\langle - \rangle$ 

■ $|\langle - \rangle|$ 

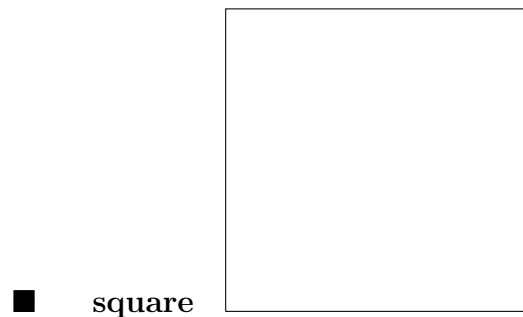
■ $- \rangle$ 

■ $- \rangle$ 

■ $- \rangle$ 

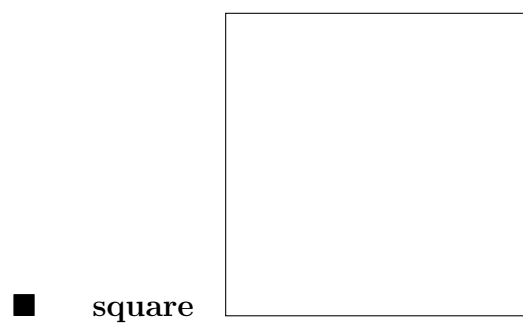
■ $- \rangle$ 

18. Box



code

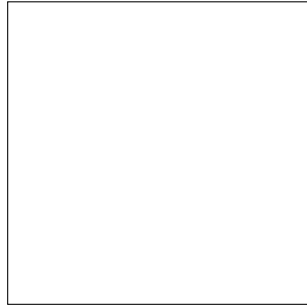
```
\begin{tikzpicture}  
\draw (0,0) -- (4,0) -- (4,4) -- (0,4) -- (0,0);  
\end{tikzpicture}
```



code

```
\begin{tikzpicture}  
\draw (0,0) -- (4,0) -- (4,4) -- (0,4) -- cycle;  
\end{tikzpicture}
```

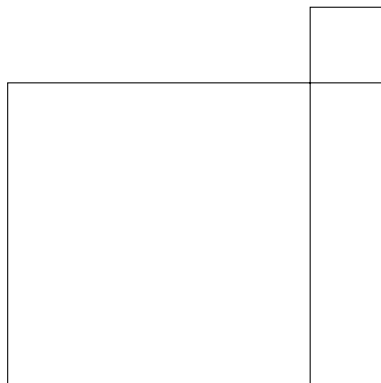
■ square



code

```
\begin{tikzpicture}  
\draw (0,0) rectangle (4,4);  
\end{tikzpicture}
```

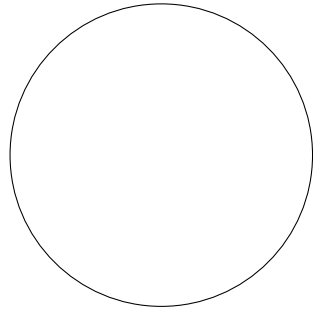
■ square



code

```
\begin{tikzpicture}  
\draw (0,0) rectangle (4,4)  
rectangle (5,5);  
\end{tikzpicture}
```

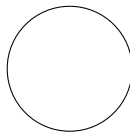
19. circle



■ circle

code

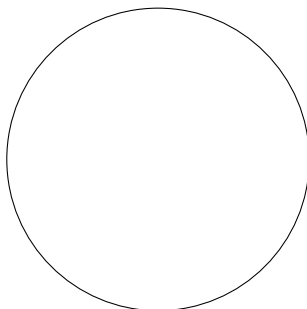
```
\begin{tikzpicture}  
\draw (3,3) circle (2cm);  
\end{tikzpicture}
```



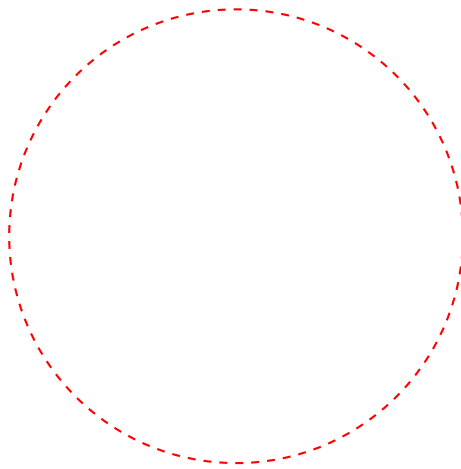
■ circle 2em

code

```
\tikz {\draw circle (2em) }
```

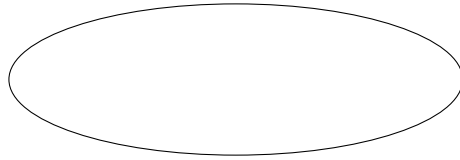


■ circle 2cm



■ `redthickdashed`

20. ellipse



■ ellipse

code

```
\begin{tikzpicture}  
\draw (2,2) ellipse (3cm and 1cm);  
\end{tikzpicture}
```

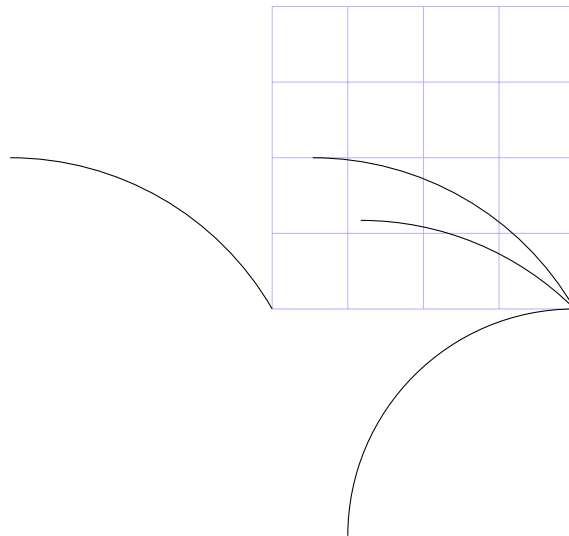


■ ellipse

code

```
\begin{tikzpicture} [scale=0.4]  
\draw (2,2) ellipse (1cm and 3cm);  
\end{tikzpicture}
```

21. arc



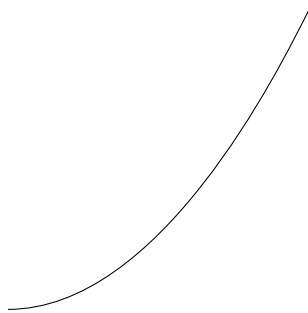
■ arc

code

```
\begin{tikzpicture}
\draw [help lines] (0,0) grid (4,4);
\draw (0,0) arc (30:90:4cm);
\draw (4,0) arc (30:90:4cm);
\end{tikzpicture}
```

22. parabola

■ parabola



23. char

1,3,4,6

code

```
\begin{tikzpicture}[baseline=(char.base)]  
\node(char)[ draw,  
fill=white,  
shape=rounded rectangle,  
% drop shadow={opacity=.5,shadow xshift=0pt},  
minimum width=1.8cm]  
{1,3,4,6};  
\end{tikzpicture}
```

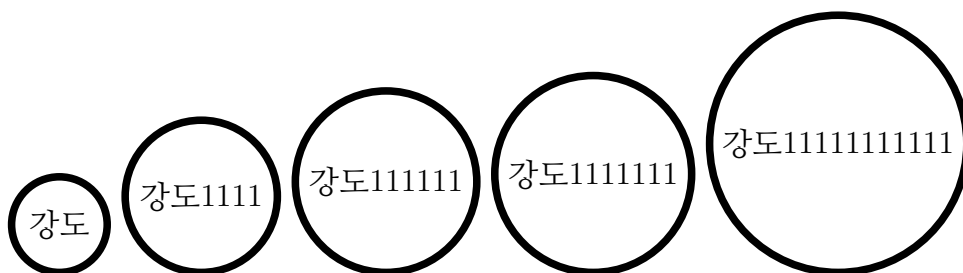
1,3,4,6

code

```
\begin{tikzpicture}  
\node(char)[ draw,  
fill=white,  
shape=rounded rectangle,  
% drop shadow={opacity=.5,shadow xshift=0pt},  
minimum width=1.8cm]  
{1,3,4,6};  
\end{tikzpicture}
```

24. 원문자

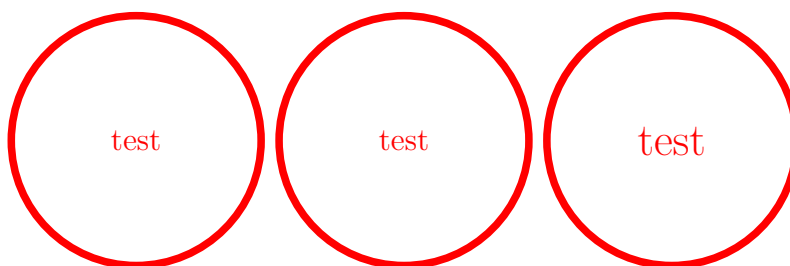
■ node circle draw



code

```
\tikz {\node [line width=1mm, circle, draw] at (0,0) {강도} }  
\tikz {\node [line width=1mm, circle, draw] at (0,0) {강도1111} }  
\tikz {\node [line width=1mm, circle, draw] at (0,0) {강도111111} }  
\tikz {\node [line width=1mm, circle, draw] at (0,0) {강도1111111} }  
\tikz {\node [line width=1mm, circle, draw] at (0,0) {강도11111111111} }
```

■ node circle=4em draw

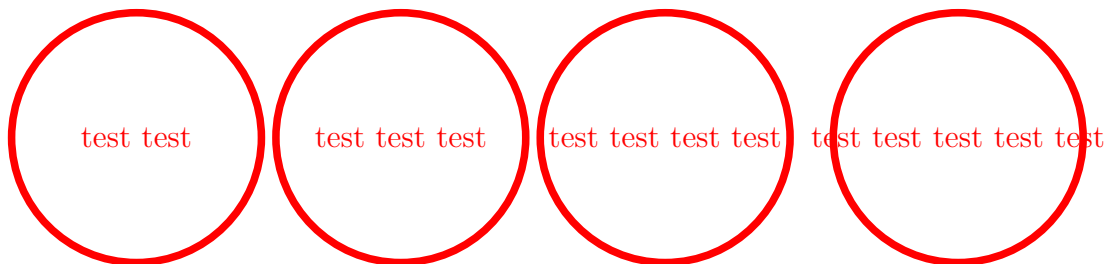


code

```
\tikz {\draw[line width=1mm, color=red] (0,0) circle (4em) node{test} }
```

```
\tikz {\draw[line width=1mm, color=red] (0,0) circle (4em) node{test} }  
\tikz {\draw[line width=1mm, color=red] (0,0) circle (4em) node{\Large test} }
```

■ node circle=4em draw 문자열의 길이가 긴 경우

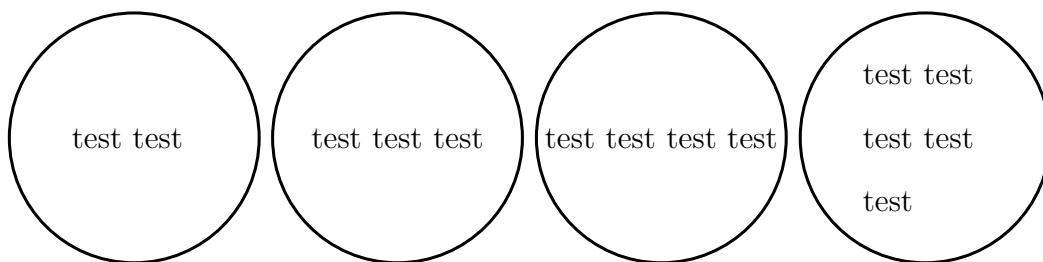


code

```
\tikz {\draw[line width=1mm, color=red] (0,0) circle (4em) node{test test} }  
\tikz {\draw[line width=1mm, color=red] (0,0) circle (4em) node{test test test} }  
\tikz {\draw[line width=1mm, color=red] (0,0) circle (4em) node{test test test } }  
\tikz {\draw[line width=1mm, color=red] (0,0) circle (4em) node{test test test }
```

25. 원문자

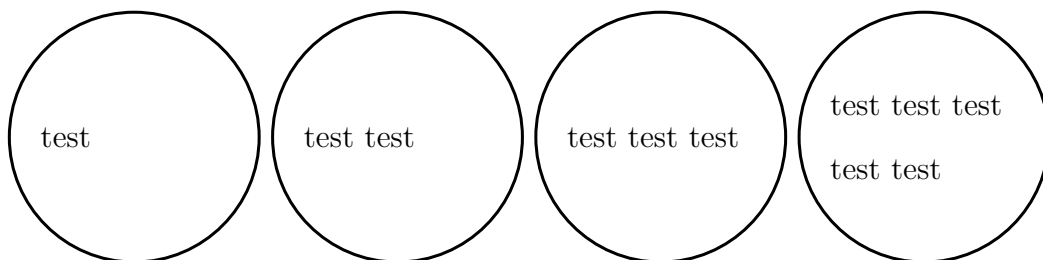
■ text width = 4em



code

```
\tikz {\draw[line width=0.4mm] (0,0) circle (4em) node[text width=4em]{test tes  
\tikz {\draw[line width=0.4mm] (0,0) circle (4em) node{test test test} }  
\tikz {\draw[line width=0.4mm] (0,0) circle (4em) node{test test test test} }  
\tikz {\draw[line width=0.4mm] (0,0) circle (4em) node[text width=4em]{test tes
```

■ text width = 6em



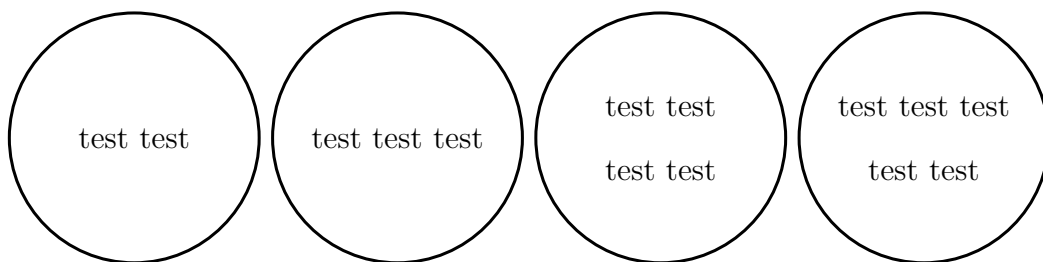
code

```
\tikz {\draw[line width=0.4mm] (0,0) circle (4em) node[text width=6em]{test} }  
\tikz {\draw[line width=0.4mm] (0,0) circle (4em) node[text width=6em]{test tes  
\tikz {\draw[line width=0.4mm] (0,0) circle (4em) node[text width=6em]{test tes
```

```
\tikz {\draw[line width=0.4mm] (0,0) circle (4em) node[text width=6em]{test tes
```


26. 원문자

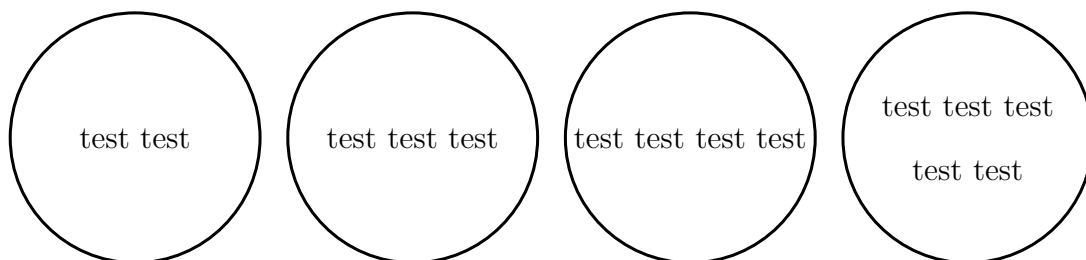
■ 가운데 정렬, text width=6em



code

```
\tikz {\draw[line width=0.4mm] circle (4em) node[align=center, text width=6em]{
\tikz {\draw[line width=0.4mm] circle (4em) node[align=center, text width=6em]{
\tikz {\draw[line width=0.4mm] circle (4em) node[align=center, text width=6em]{
\tikz {\draw[line width=0.4mm] circle (4em) node[align=center, text width=6em]{
```

■ 가운데 정렬, text width=8em

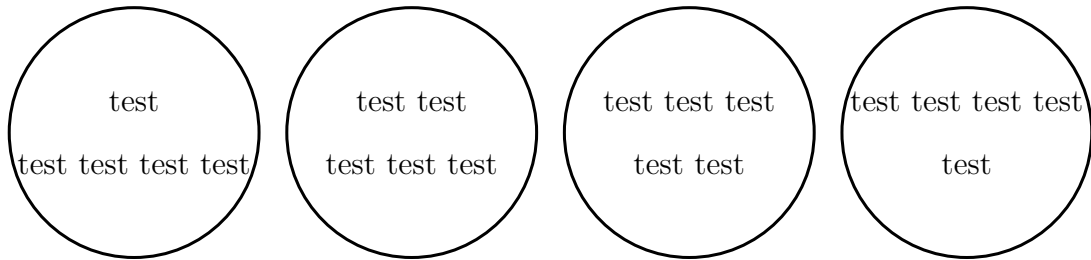


code

```
\tikz {\draw[line width=0.4mm] circle (4em) node[align=center, text width=8em]{
\tikz {\draw[line width=0.4mm] circle (4em) node[align=center, text width=8em]{
\tikz {\draw[line width=0.4mm] circle (4em) node[align=center, text width=8em]{
```

```
\tikz {\draw[line width=0.4mm] circle (4em) node[align=center, text width=8em]{
```

■ 가운데 정렬, text width=8em



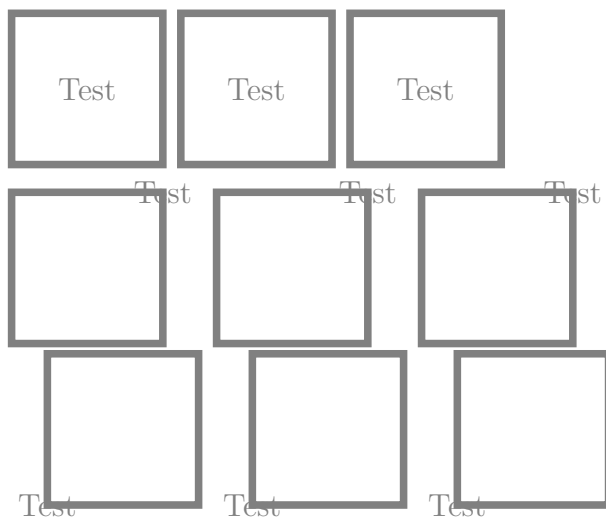
code

```
\tikz {\draw[line width=0.4mm] circle (4em) node[align=center, text width=8em]{
\tikz {\draw[line width=0.4mm] circle (4em) node[align=center, text width=8em]{
\tikz {\draw[line width=0.4mm] circle (4em) node[align=center, text width=8em]{
\tikz {\draw[line width=0.4mm] circle (4em) node[align=center, text width=8em]{
```

27. 사각 문자



■ 문자 위치 조정



■ scale 적용



28. 사각 문자

Test	Test 내용 설명
------	------------

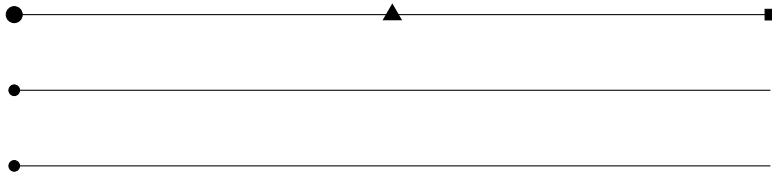
1	Test 내용 설명
---	------------

2	Test 내용 설명
---	------------

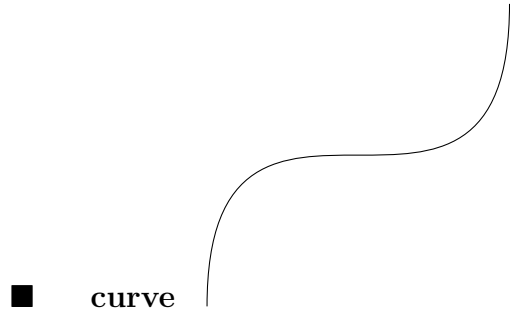
1	Test 내용 설명
---	------------

2	Test 내용 설명
---	------------

29. mark



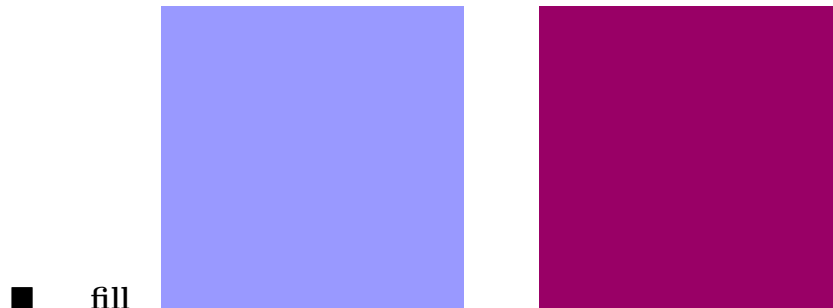
30. curve



code

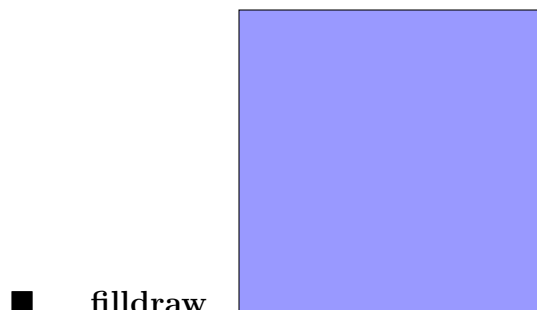
```
\begin{tikzpicture}  
\draw (0,0) .. controls (0,4) and (4,0) .. (4,4);  
\end{tikzpicture}
```

31. Filling



code

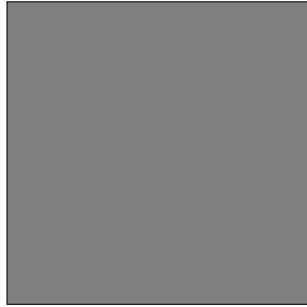
```
\begin{tikzpicture}
\fill[blue!40!white] (0,0) rectangle (4,4);
\fill[blue!40!red] (5,0) rectangle (9,4);
\end{tikzpicture}
```



code

```
\begin{tikzpicture}
\filldraw[fill=blue!40!white, draw=black] (0,0) rectangle (4,4);
\end{tikzpicture}
```

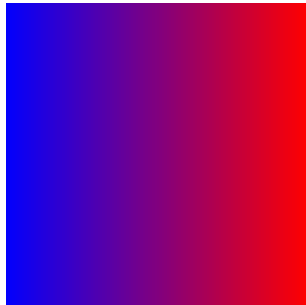

■ **filldraw**



code

```
\begin{tikzpicture}  
\filldraw[fill=gray, draw=black] (0,0) rectangle (4,4);  
\end{tikzpicture}
```

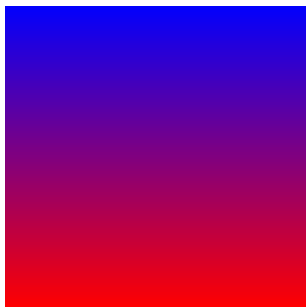
32. Shading



- **shade1** Instead of doing it from left to right we could do it from top to bottom.

code

```
\begin{tikzpicture}
\shade [left color=blue,right color=red]
(0,0) rectangle (4,4);
\end{tikzpicture}
```

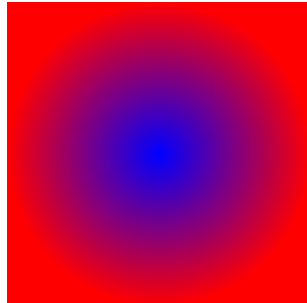


- **shade 2** Or we could even change it by specifying an inner and outer colour like this.

code

```
\begin{tikzpicture}
\shade [top color=blue,bottom color=red]
(0,0) rectangle (4,4);
```

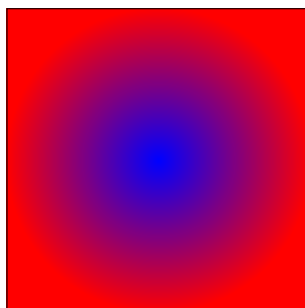
```
\end{tikzpicture}
```



■ shade 3

code

```
\begin{tikzpicture}  
\shade [inner color=blue,outer color=red]  
(0,0) rectangle (4,4);  
\end{tikzpicture}
```

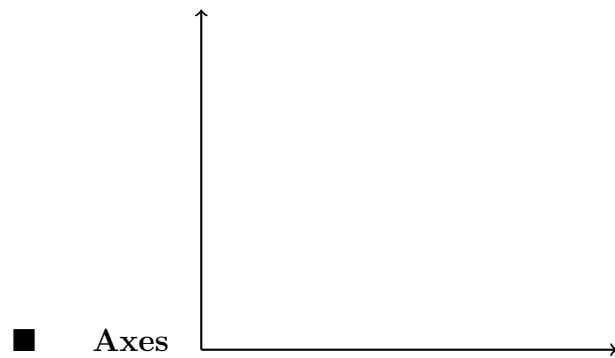


■ shadepdraw

code

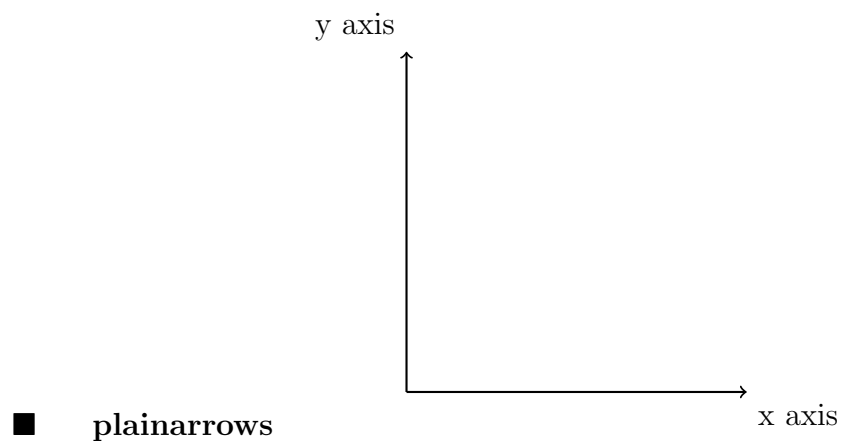
```
\begin{tikzpicture}  
\shadepdraw [inner color=blue,outer color=red, draw=black]  
(0,0) rectangle (4,4);  
\end{tikzpicture}
```

33. Axes



code

```
\begin{tikzpicture}
\draw[thick,->] (0,0) -- (5.5,0);
\draw[thick,->] (0,0) -- (0,4.5);
\end{tikzpicture}
```



code

```
\begin{tikzpicture}
\draw[thick,->] (0,0) -- (4.5,0) node[anchor=north west] {x axis};
```

```
\draw[thick,->] (0,0) -- (0,4.5) node[anchor=south east] {y axis};  
\end{tikzpicture}
```

4 -

3 -

2 -

1 -

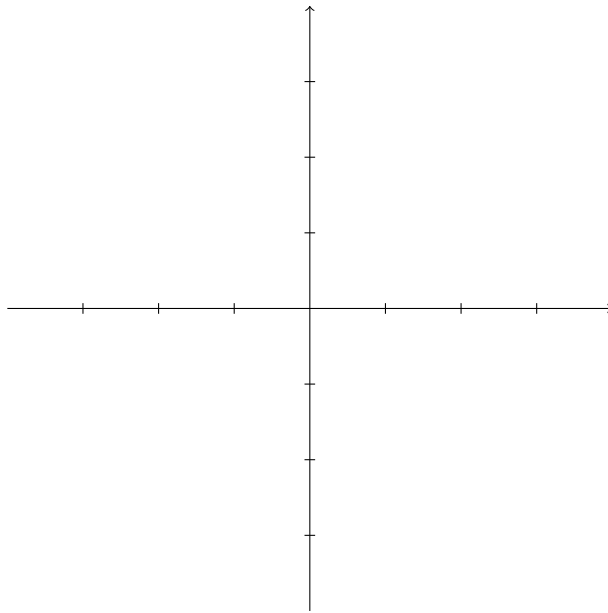
■ **foreach** $\begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 0 & 1 & 2 & 3 & 4 \end{matrix}$

code

```
\begin{tikzpicture}  
\foreach \x in {0,1,2,3,4}  
    \draw (\x cm,1pt) -- (\x cm,-1pt) node[anchor=north] {$\x$};  
\foreach \y in {0,1,2,3,4}  
    \draw (1pt,\y cm) -- (-1pt,\y cm) node[anchor=west] {$\y$};  
\end{tikzpicture}
```

34. axes with tick marks

■ axes



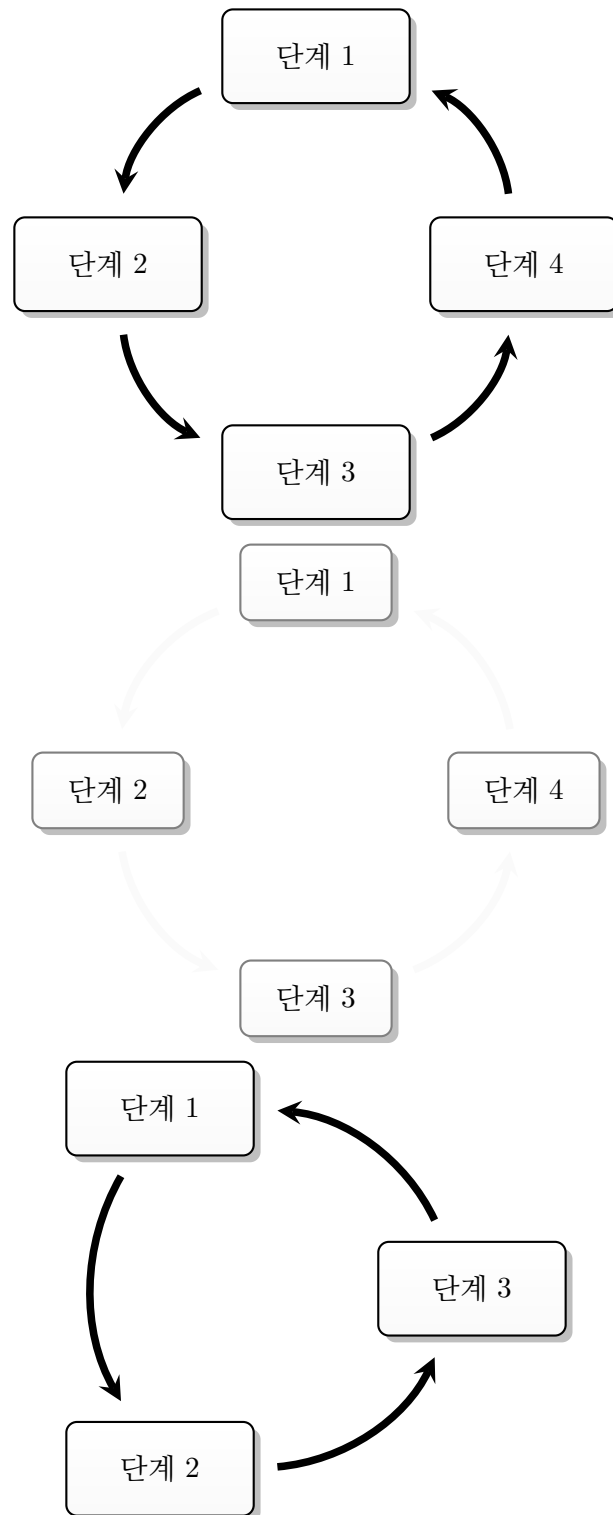
CHAPTER 3

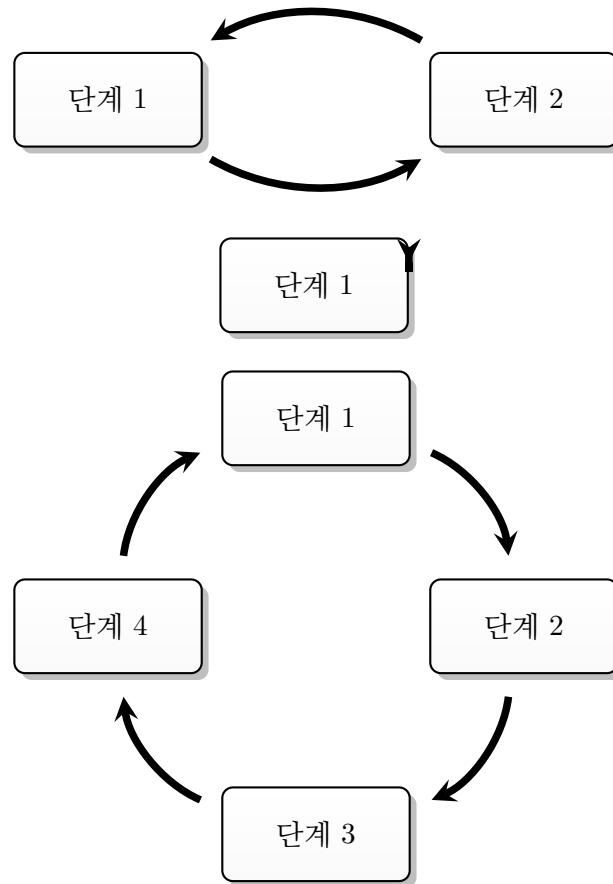
diagram

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2.	flow diagram	65
3.	descriptive diagram	66
4.	bubble diagram	68
5.	constellation diagram	70
6.	sequence diagram	71

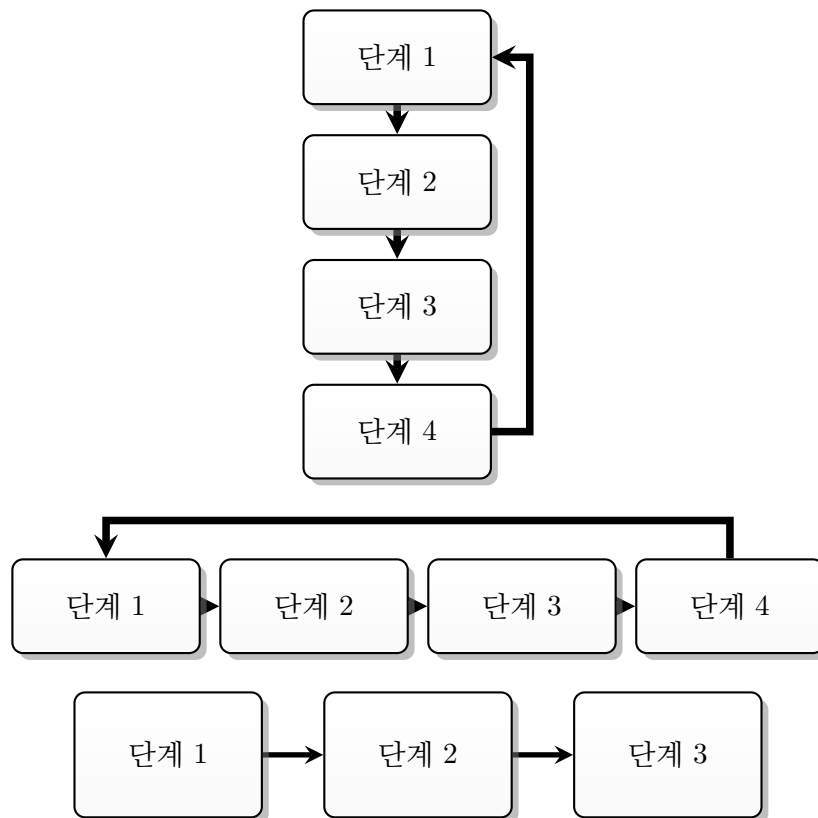
1. circular diagram





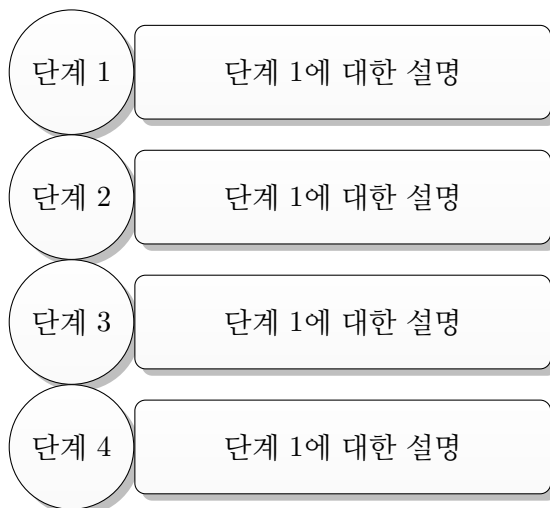
2. flow diagram

■ flow diagram



3. descriptive diagram

■ descriptive



■ descriptive : descriptive items y sep=5em

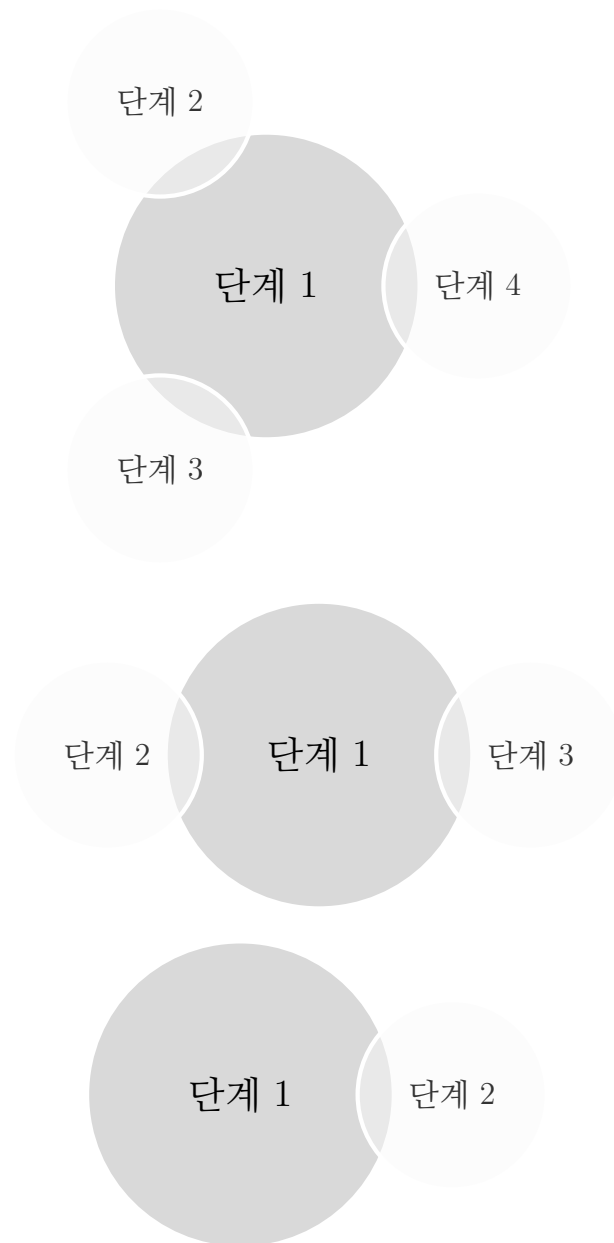



■ descriptive : descriptive items y sep=5em



4. bubble diagram

■ bubble





단계 1

5. constellation diagram

■ constellation



6. sequence diagram

■ sequence



CHAPTER 4

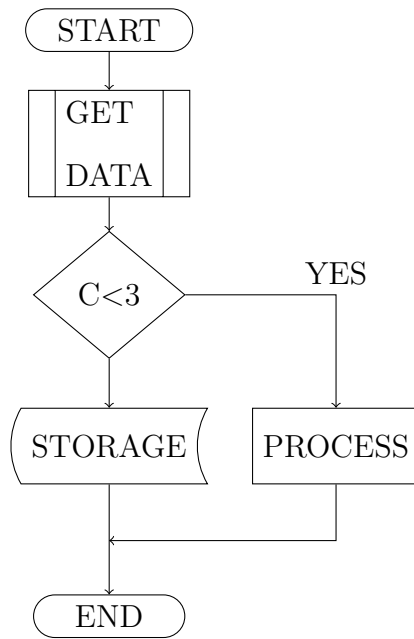
flow Chart

Contents

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1. flowchart

- Process
- Decision
- Predefined Process
- Storage
- Terminal



표면 조정

표면 조정

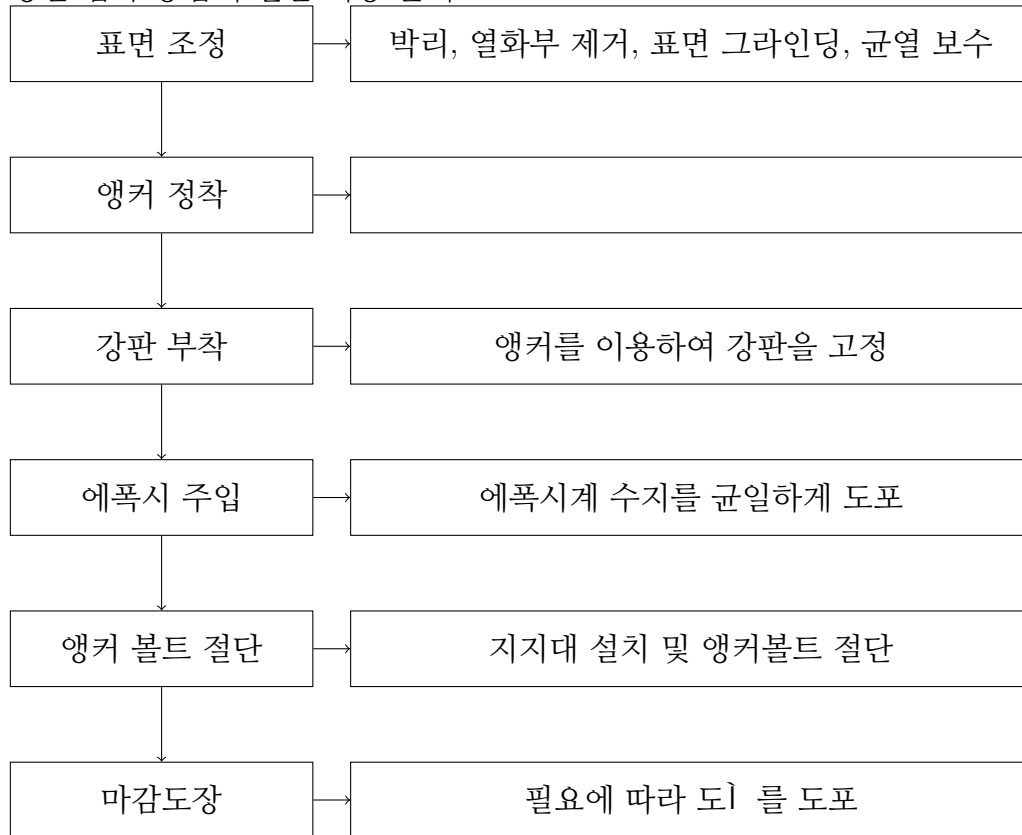
표면 조정

표면 조정

표면 조정

표면 조정

강판 접착 공법의 일반 시공 순서도



CHAPTER 5

Mind Map

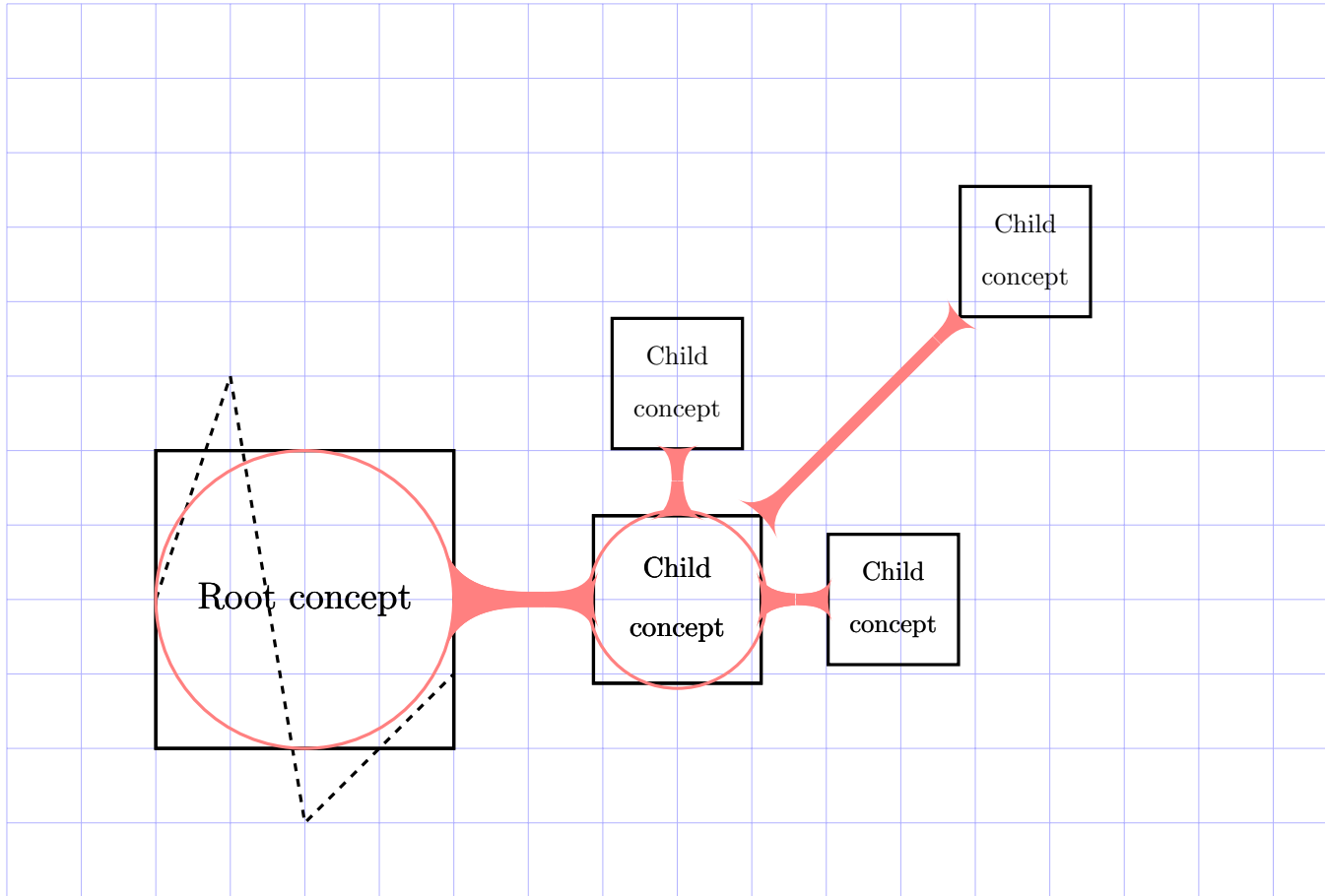
Contents

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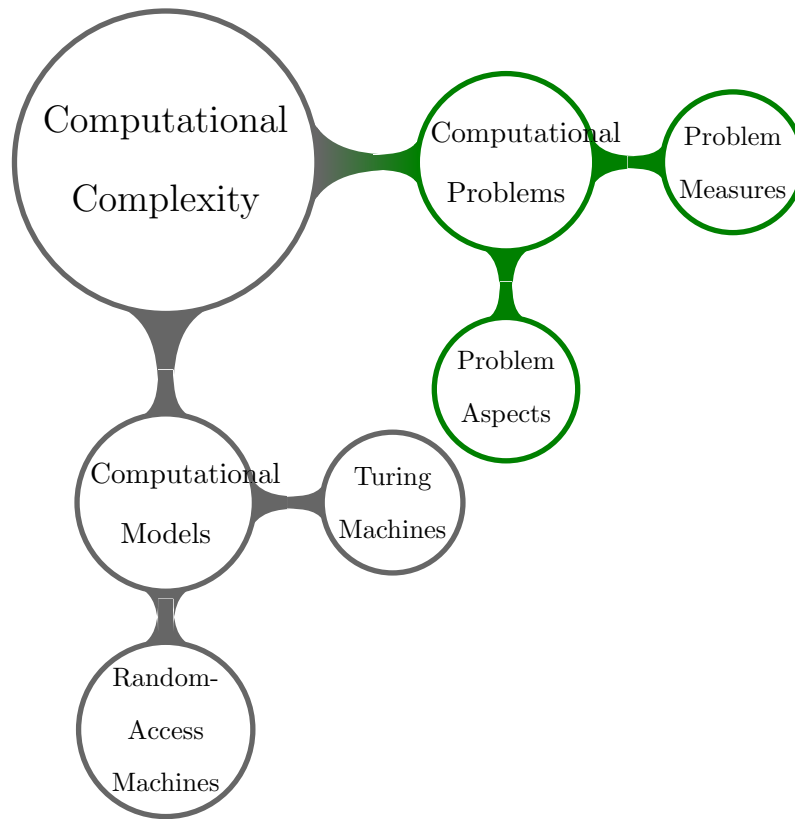
1. mind map : Package 설정

```
% =====  
% tikz package  
%  
% -----  
  
\usepackage{tikz}%  
\usetikzlibrary{arrows,positioning,shapes}  
\usetikzlibrary{mindmap}
```


■ 기본



3. mind map : 기본 세팅



■ mindmap style

every mindmap

■ node style

every node/.style=concept,

■ concept size

every minimum size=0.5cm

■ concept line width

line width=2pt,

■ concept color

concept color=<color>

every concept/.append style={fill={none}},

■ concept text size

text width=4cm,

■ concept text color

text=black,

■ append style - scale

every node/.append style={scale=1.0},

■ append style - fill

every concept/.append style={fill={none}},

■ growl

grow cyclic,

■ level

level 1/.append style={level distance=4.5cm,sibling angle=45 },

level 2/.append style={level distance=3.0cm,sibling angle=90 }

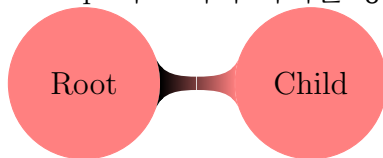
4. mind map : map style 맵의 종류

■ style

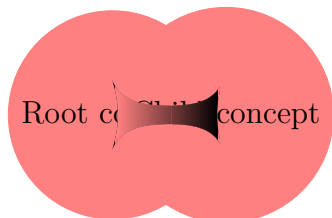
- every mindmap
- small mindmap
- mindmap
- large mindmap
- huge mindmap

■ every mindmap style

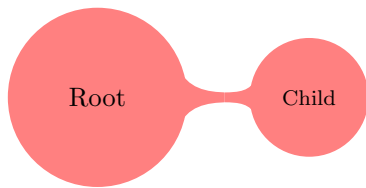
concept의 크기와 거리를 넣어주어야 한다.



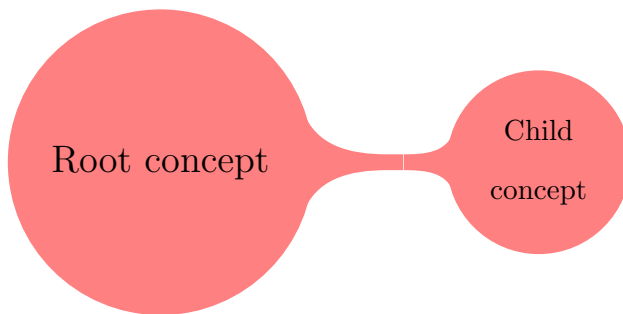
■ every mindmap style



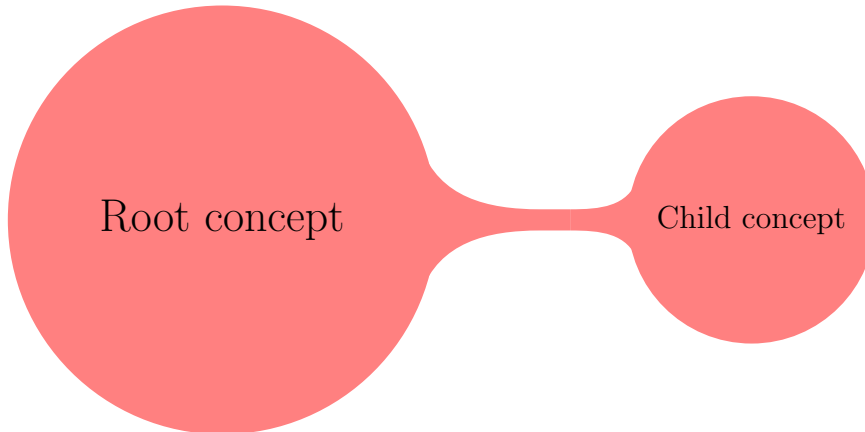
■ small mindmap style



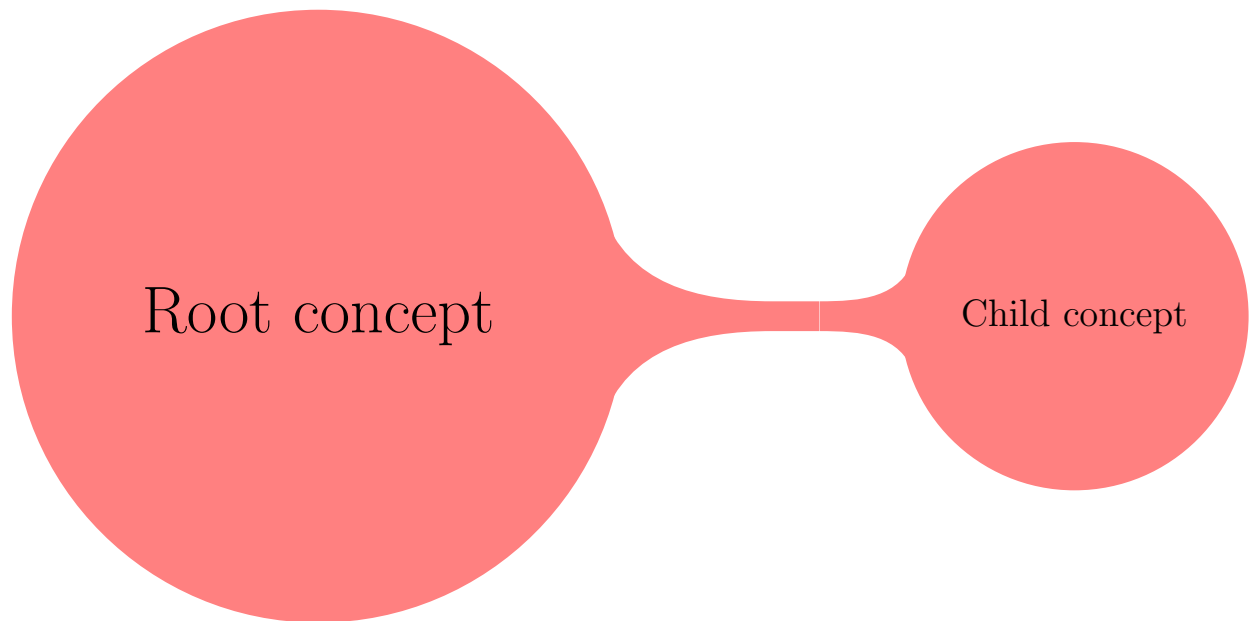
■ mindmap style



■ large mindmap style

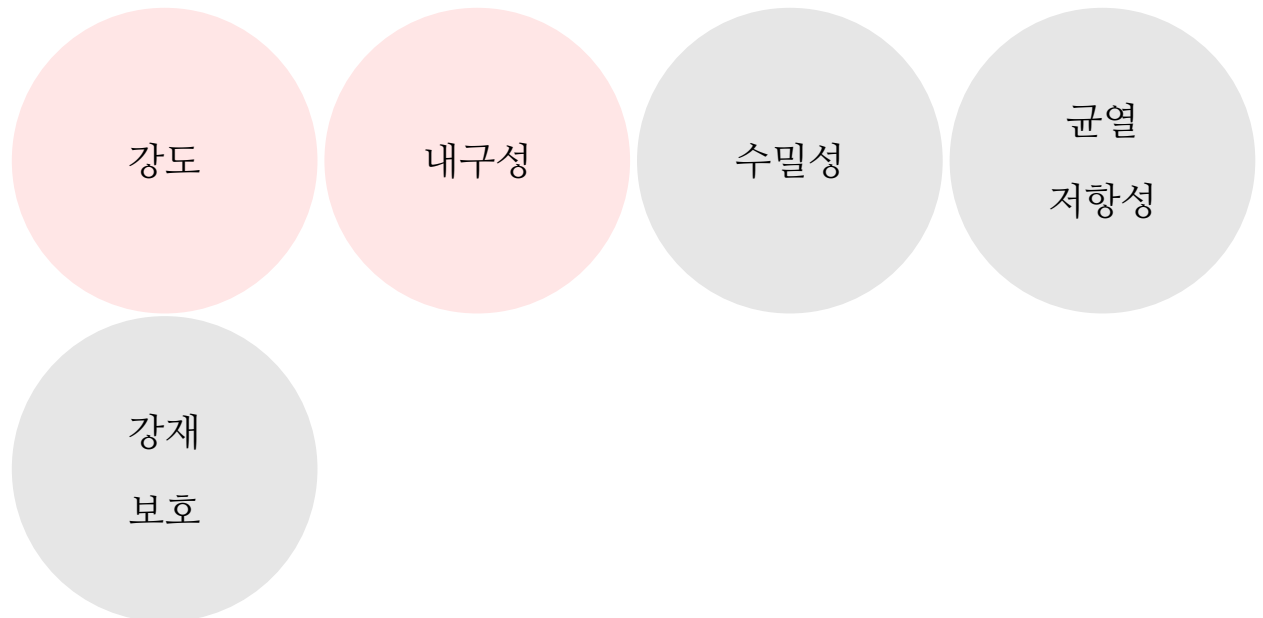


■ huge mindmap style

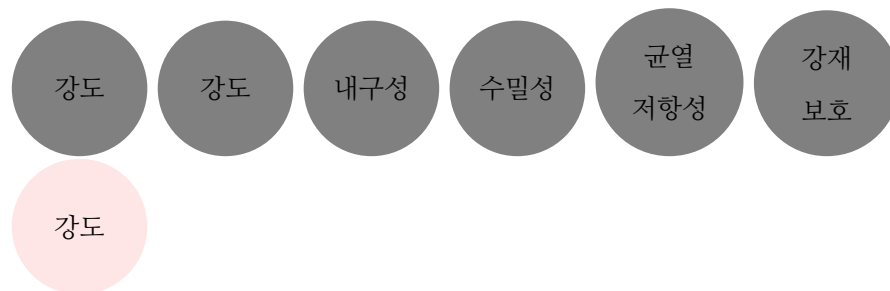


5. mind map : 기본 단위 concept

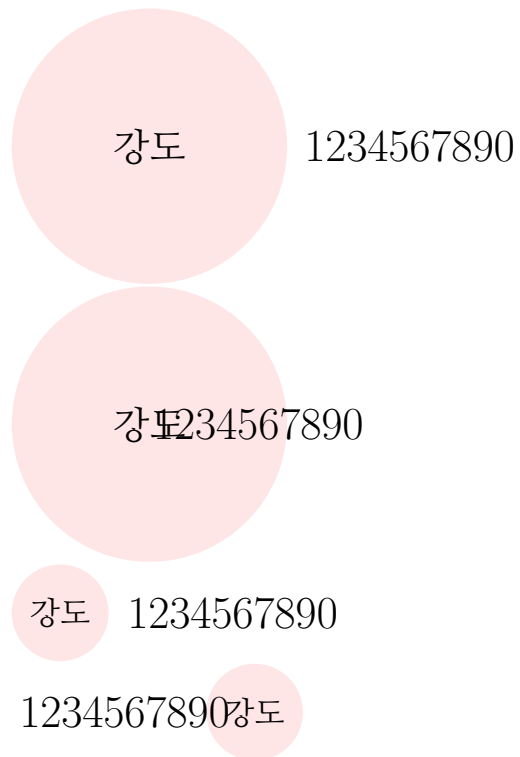
■ concept



■ extra concept



6. mind map : annotation latex mindmap annotation position



7. latex mindmap annotation position

■ annotation position - left



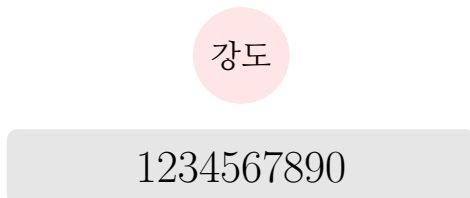
■ annotation position - right



■ annotation position - above



■ annotation position - below

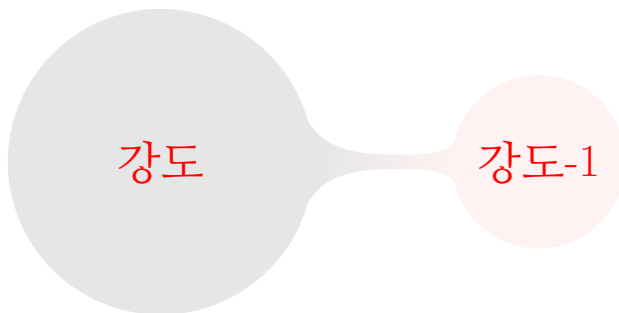


8. mind map : color

■ color

concept color=black!10

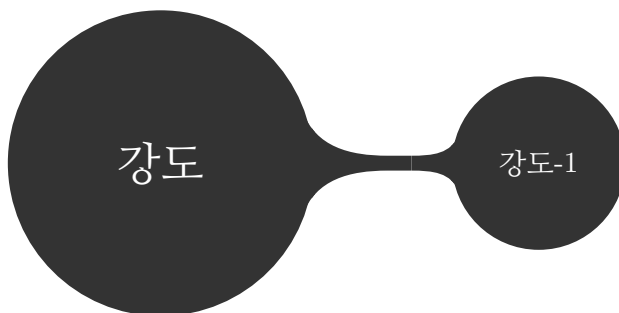
text=red



■ color

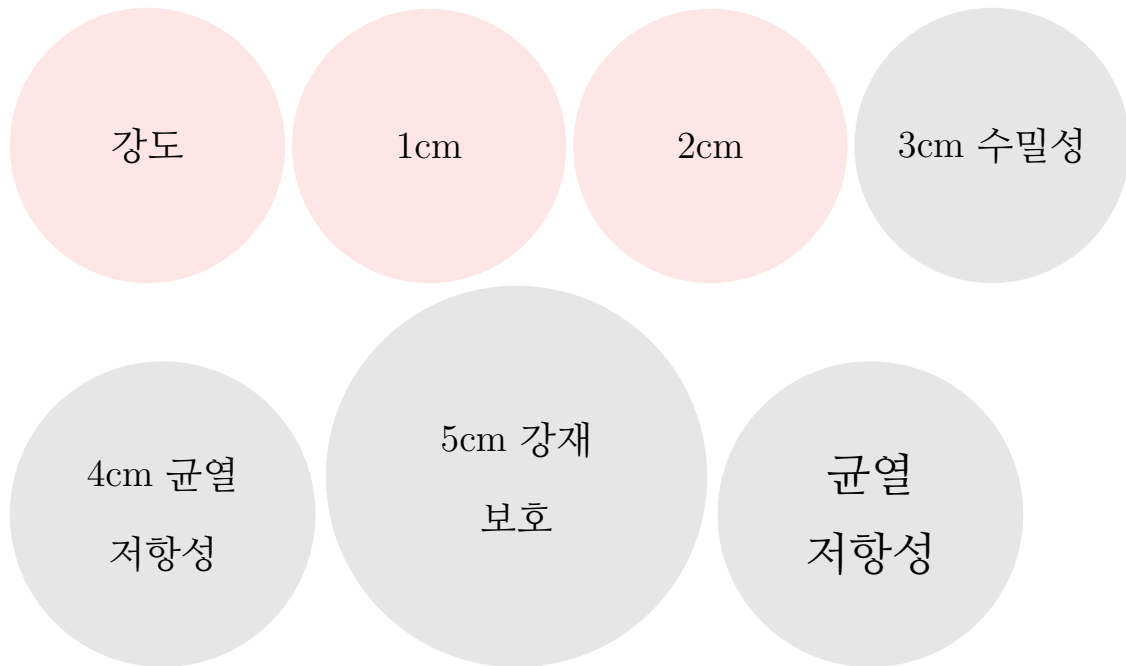
concept color=black!80

text=white

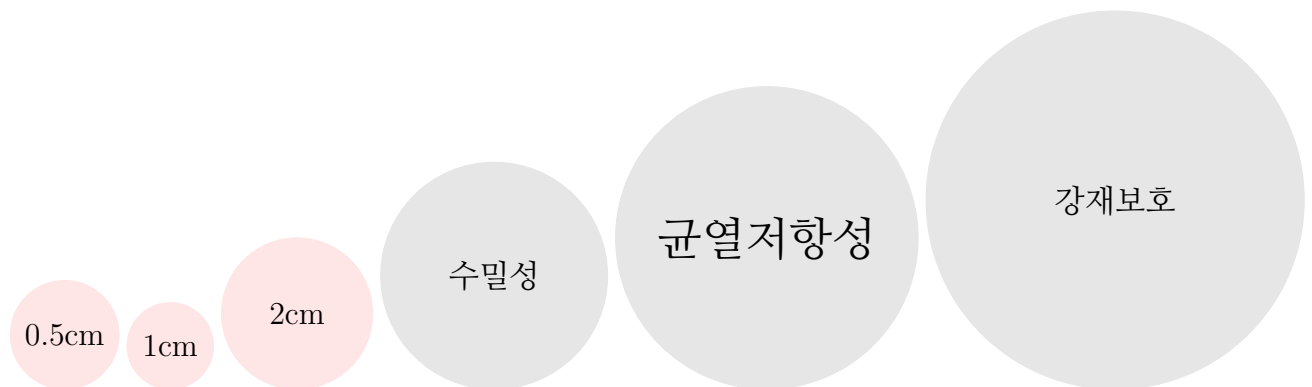


9. mind map : size

■ concept size

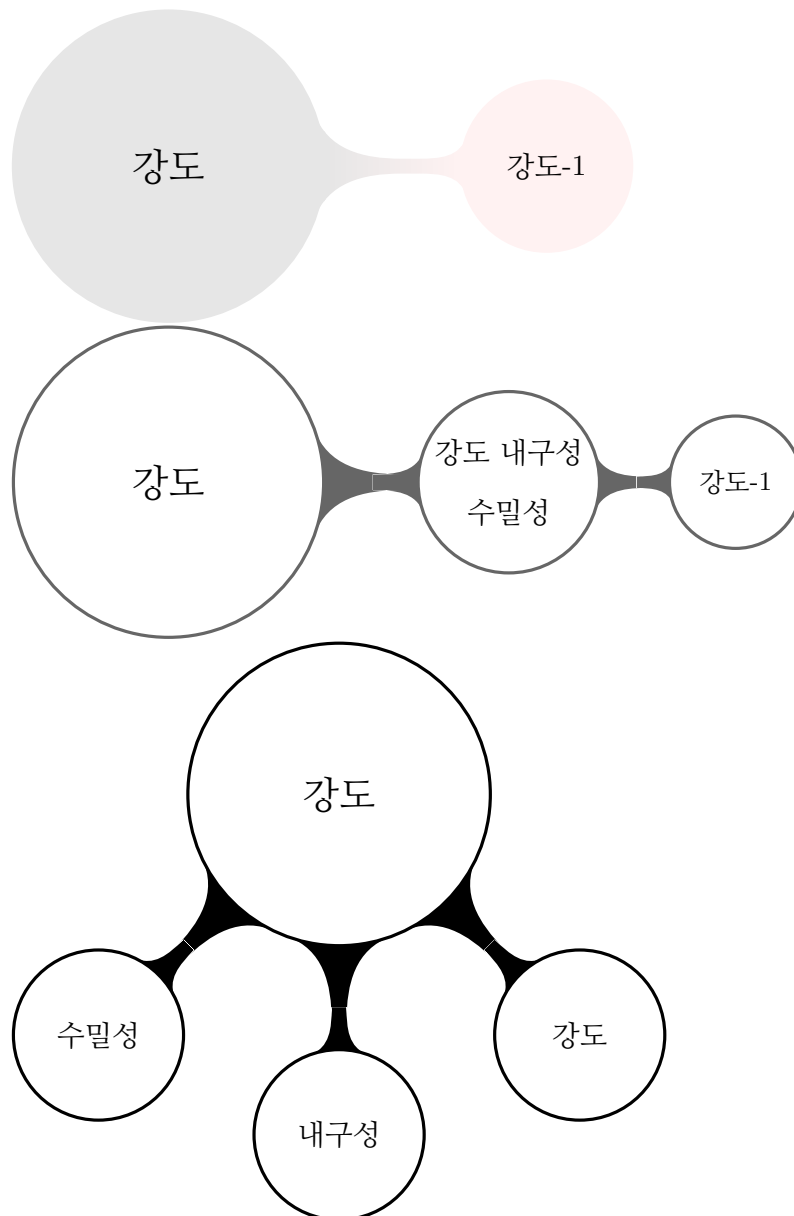


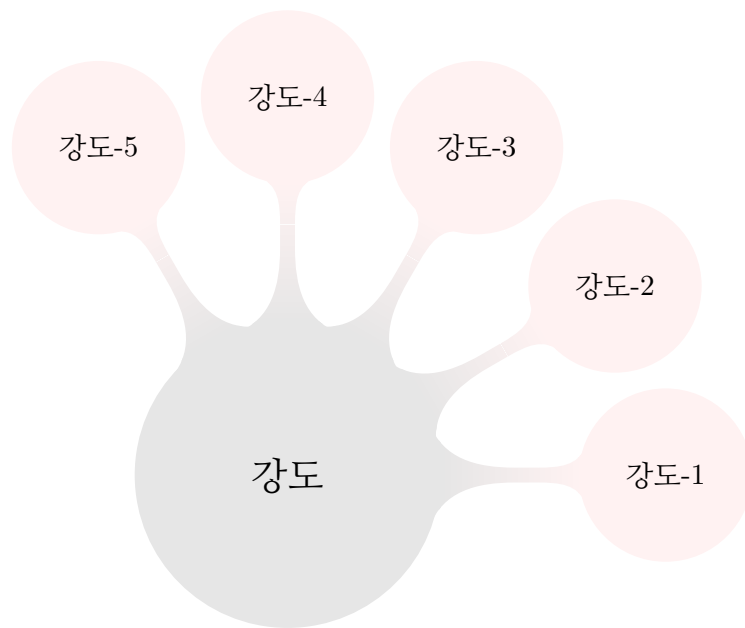
■ every mindmap size



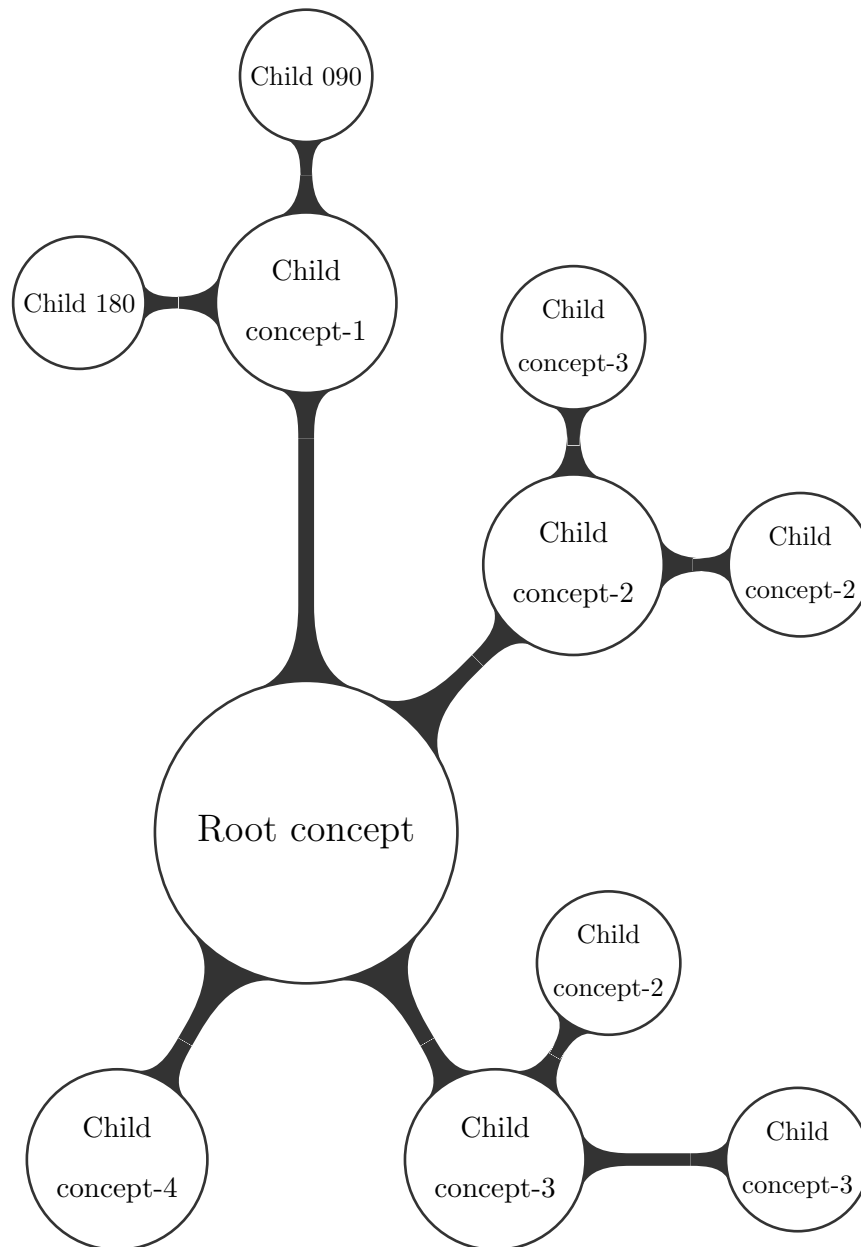
10. mind map : trees

■ grow



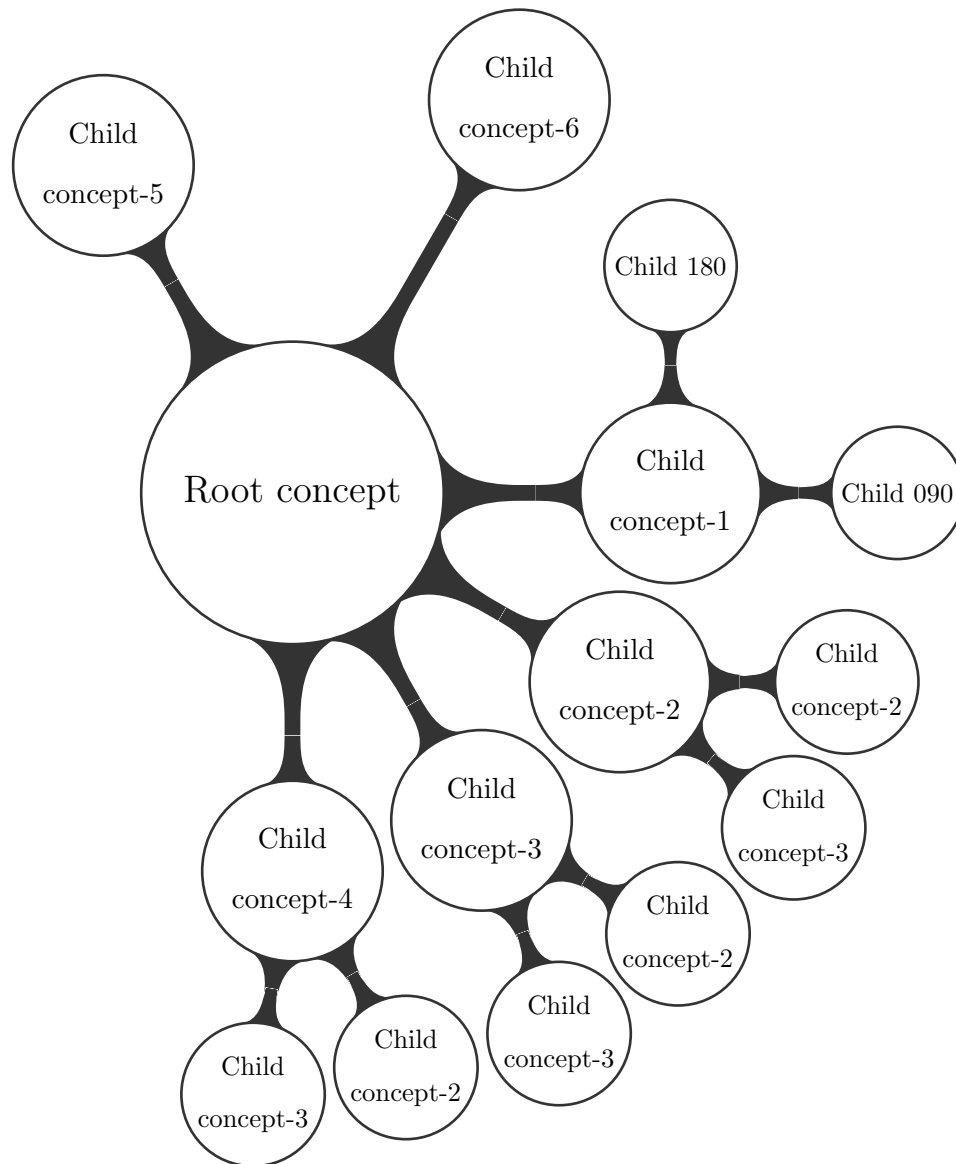


11. mind map : clockwise



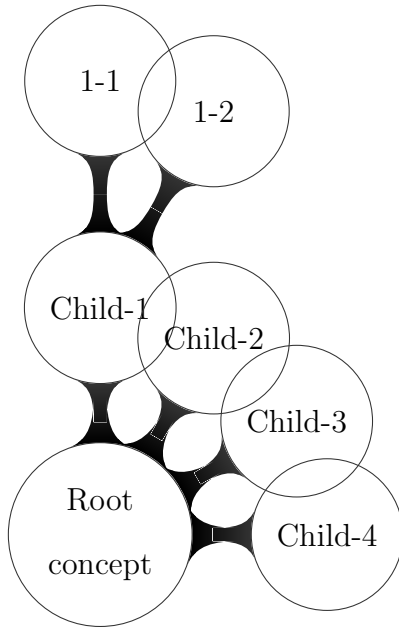
```
\tikz[ mindmap,
line width=1pt,
% grow cyclic,
concept color=black!80,
concept/.append style={fill={none}}
]
\node [concept] {Root concept}
child [grow=090,level distance=7cm] {node[concept] {Child concept-1}
child [grow=180,level distance=3cm] {node[concept] {Child 180} }
child [grow=090,level distance=3cm] {node[concept] {Child 090} }
}
child [grow=45] {node[concept] {Child concept-2}
child [grow=000,level distance=3cm] {node[concept] {Child concept-2} }
child [grow=090,level distance=3cm] {node[concept] {Child concept-3} }
}
child [grow=-060,sibling angle=90]{node[concept] {Child concept-3}
[clockwise from=60]
child [level distance=3cm] {node[concept] {Child concept-2} }
child [level distance=4cm] {node[concept] {Child concept-3} }
}
child [grow=-120]{node[concept] {Child concept-4} };
```


12. mind map : clockwise

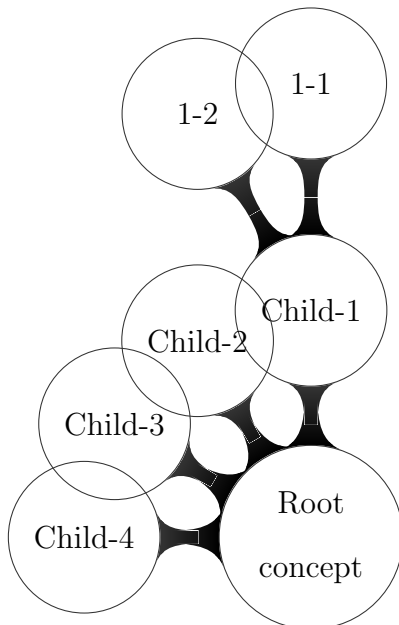


13. mind map : clockwise & sibling angle

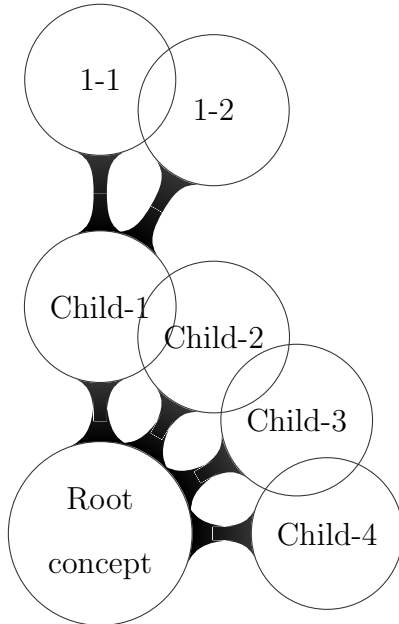
- clockwise from = 90 sibling angle=30



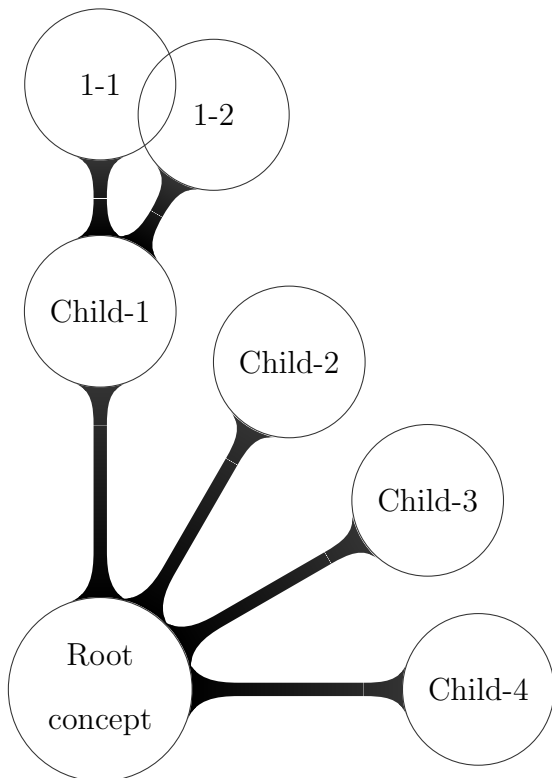
- clockwise from = 90 sibling angle=-30



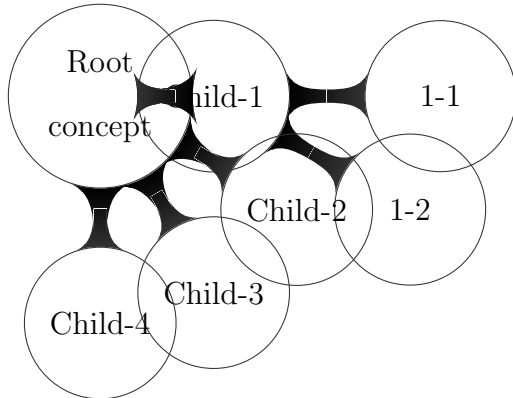
- clockwise from = 90 sibling angle=30, level distance=3cm



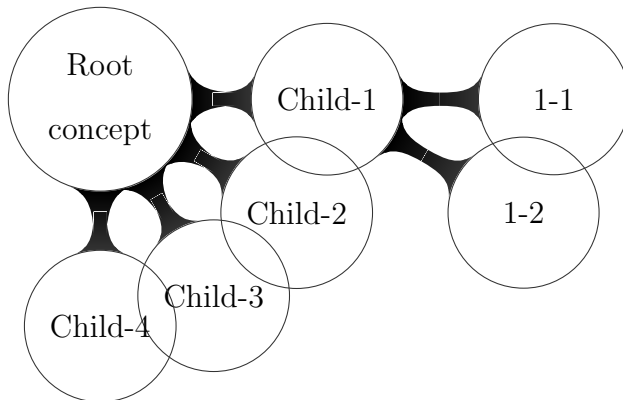
- clockwise from = 90 sibling angle=30



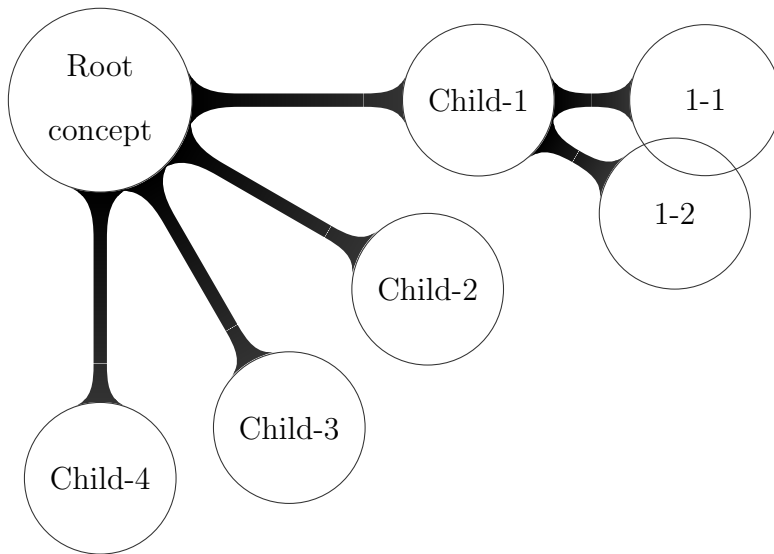
- clockwise from = 0 sibling angle=30



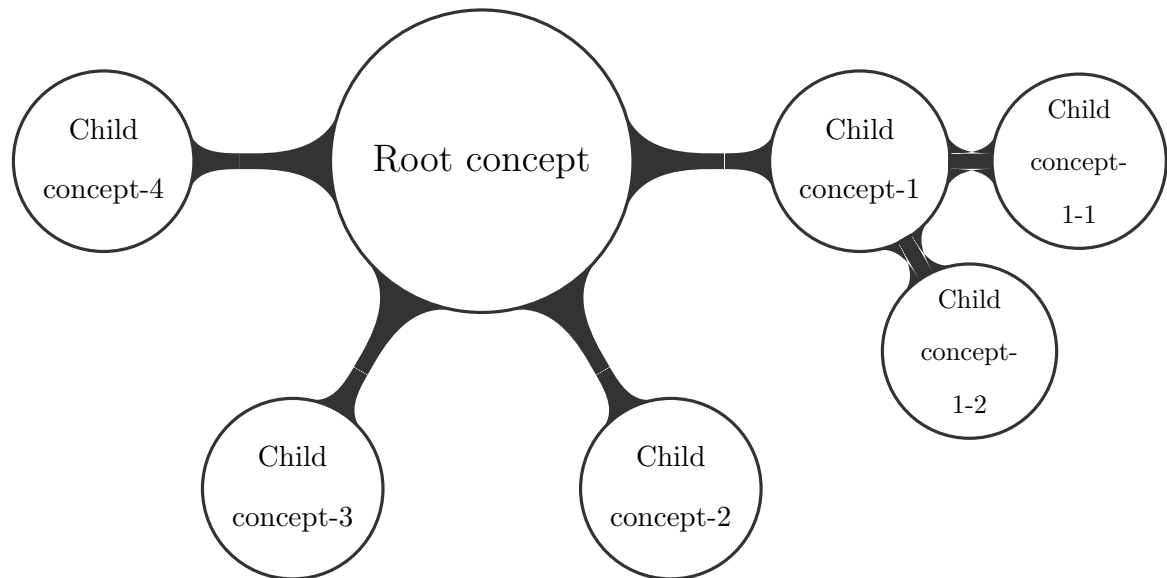
- clockwise from = 0, sibling angle=30, level distance=3cm



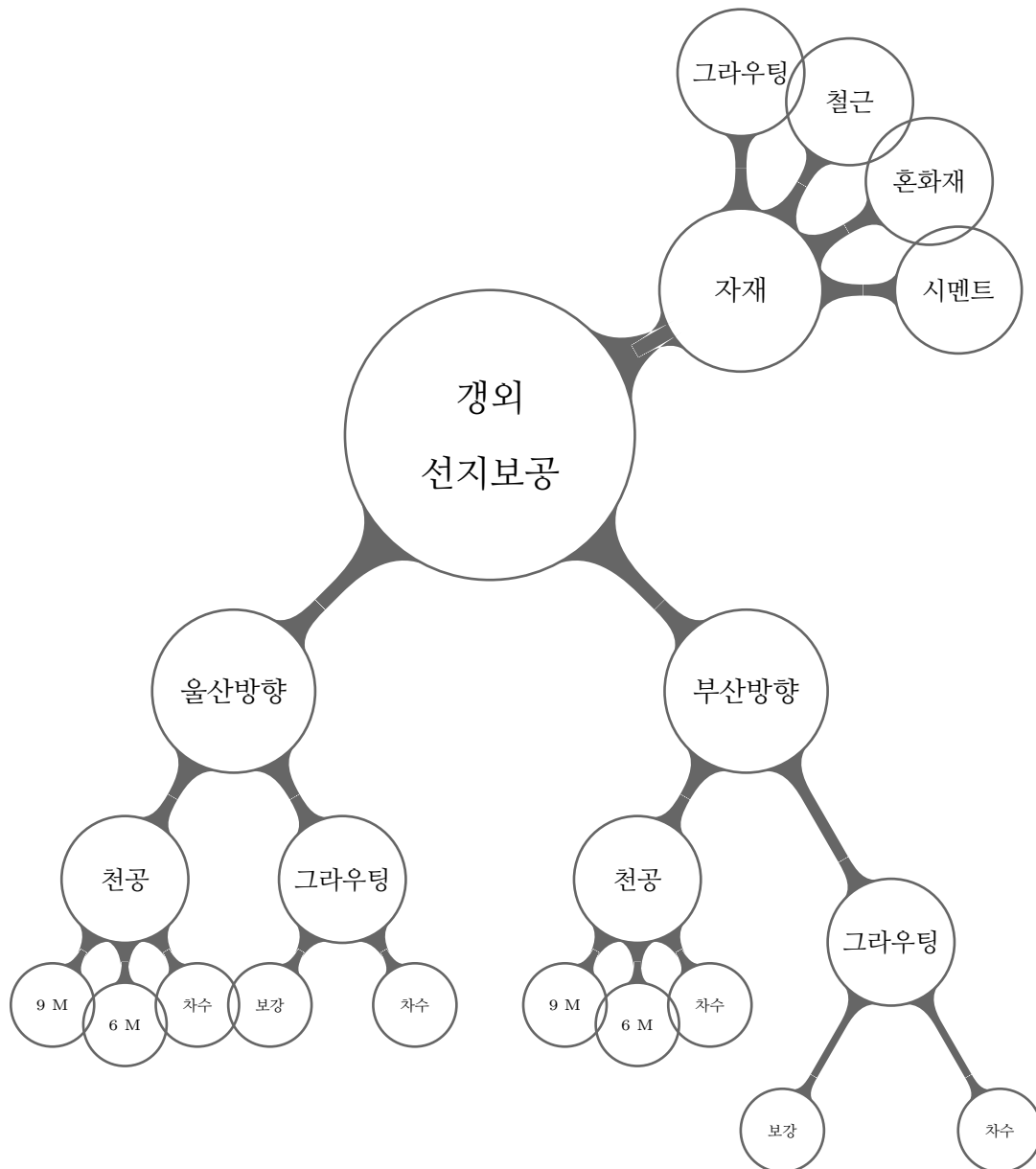
■ clockwise from = 0, sibling angle=30, level distance=5cm



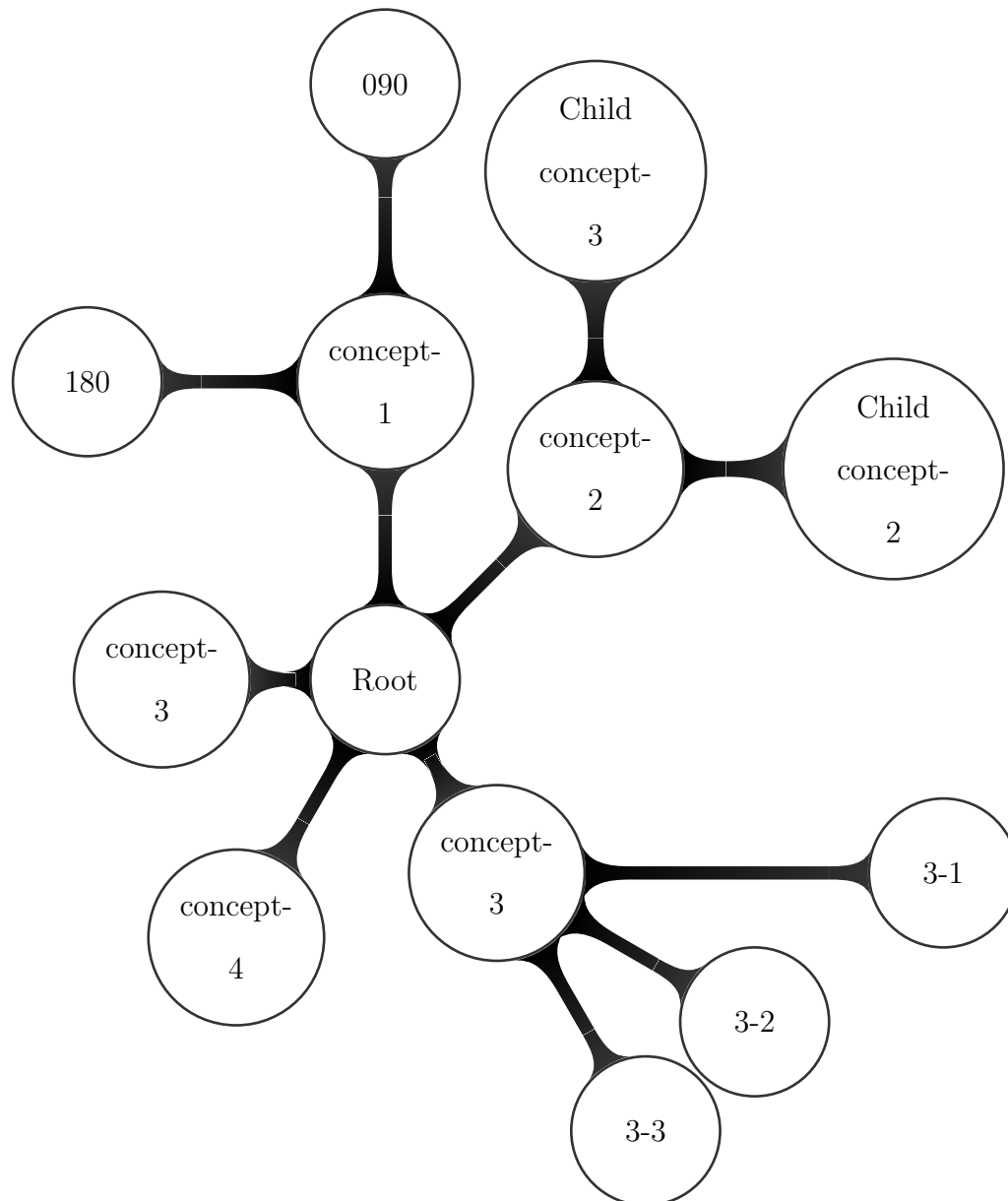
■ clockwise from = 00



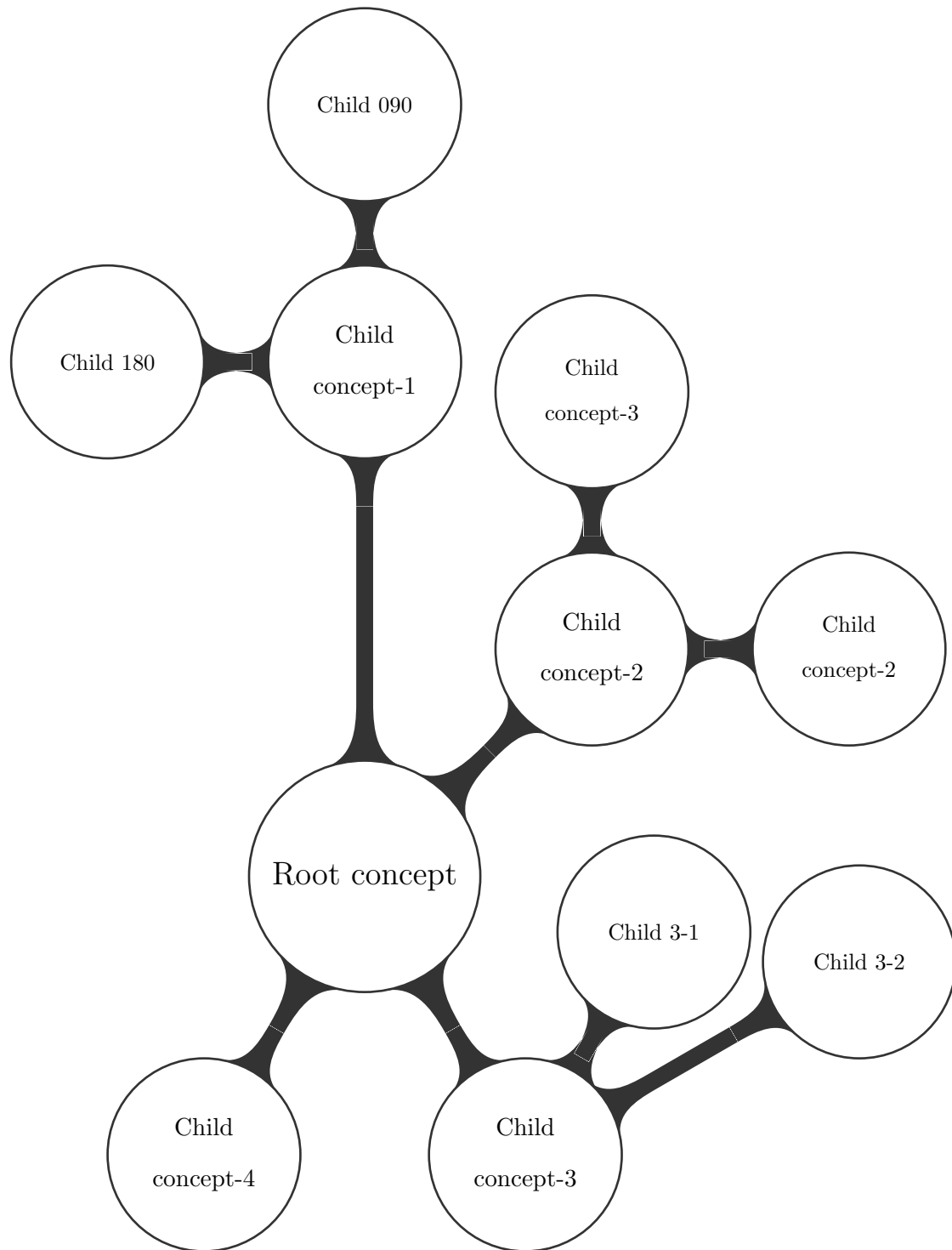
14. mind map



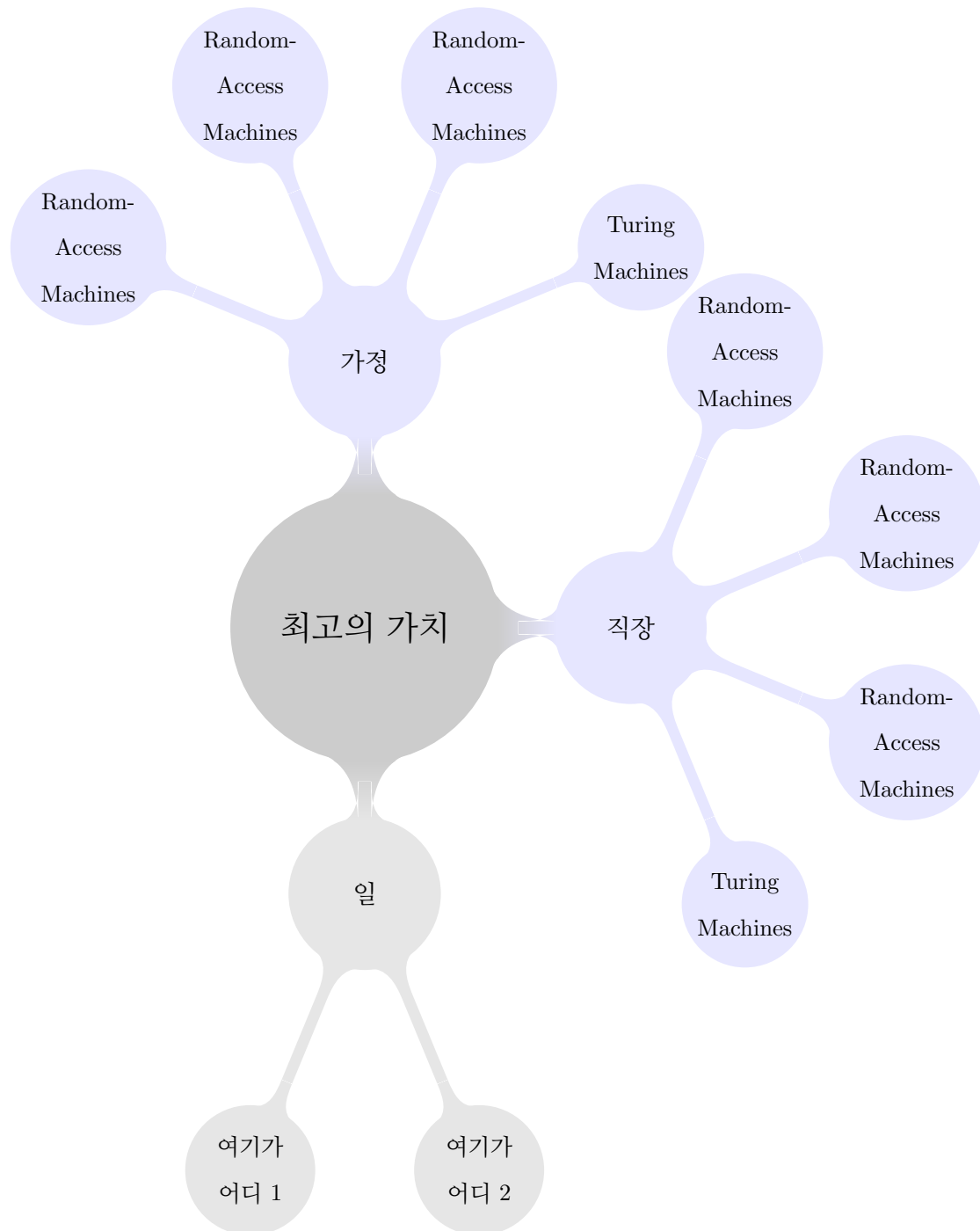
15. mind map : every mindmap



16. `every concept.style=minimum size=3cm`



17. mind map



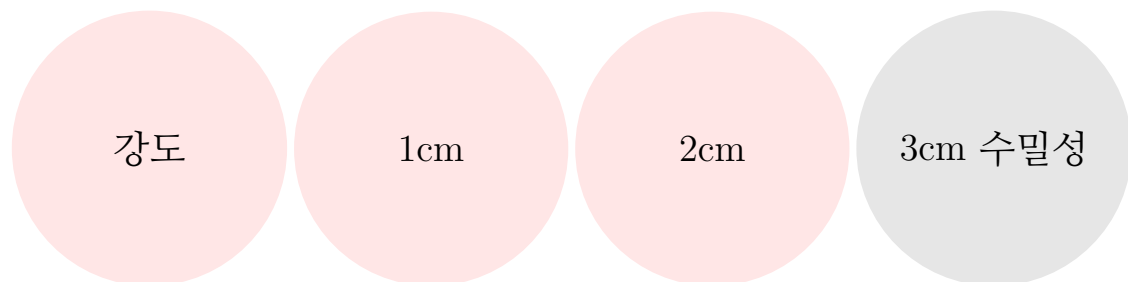
```
\begin{tikzpicture}[ mindmap,
    every node/.style=concept,
    concept color=black!20,
    grow cyclic,
    level 1/.append style={level distance=4.5cm,sibling angle=90},
    level 2/.append style={level distance=4.5cm,sibling angle=45}
]
\node [root concept] { Computational Complexity} % root
    child [concept color=black!10] { node {여기가 어디 0}
child { node {여기가 어디 1} }
child { node {여기가 어디 2} }
    }
child [concept color=blue!10] { node {Computational Models}
child { node {Turing Machines} }
child { node {Random-Access Machines} }
child { node {Random-Access Machines} }
child { node {Random-Access Machines} }
child { node {Random-Access Machines} }
    };
\end{tikzpicture}
```

18. mind map : 사례 - 원 하나

- every mindmap은 줄바꿈이 안됨

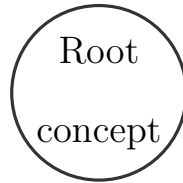


- mindmap은 줄바꿈이 됨

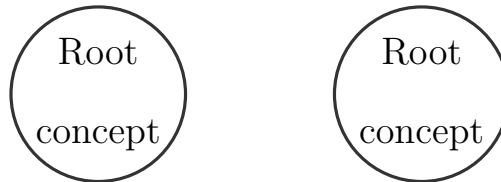




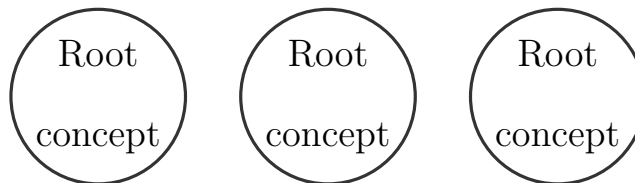
■ 원 1개



■ 원 2개



■ 원 3개

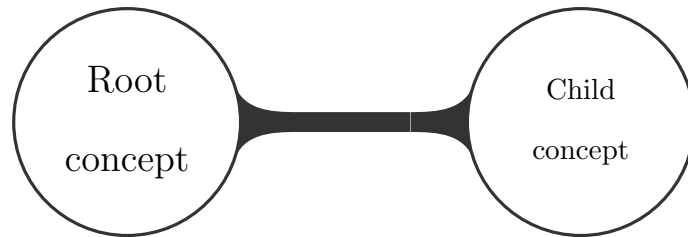


■ 원 4개

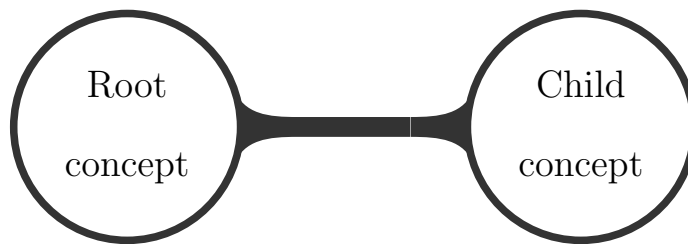


19. mind map : 사용예 - 원 둘

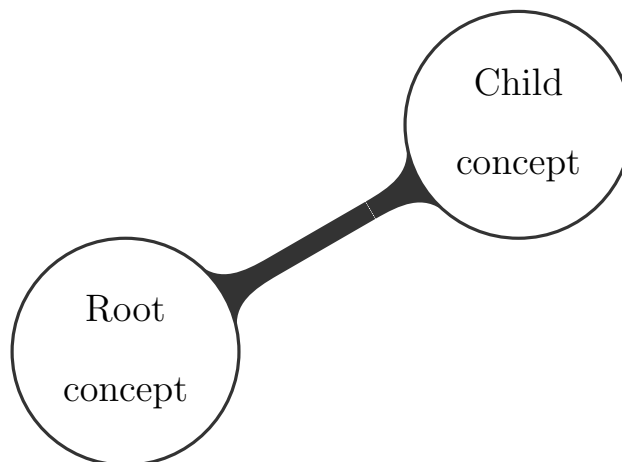
- minimum size = 3cm



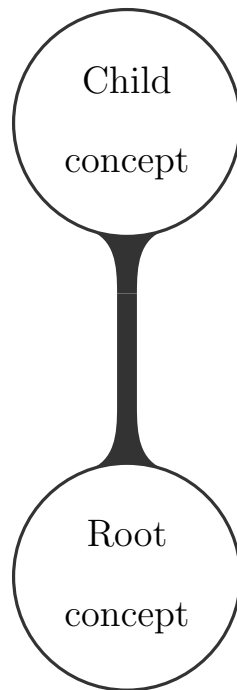
- clockwise from = 0



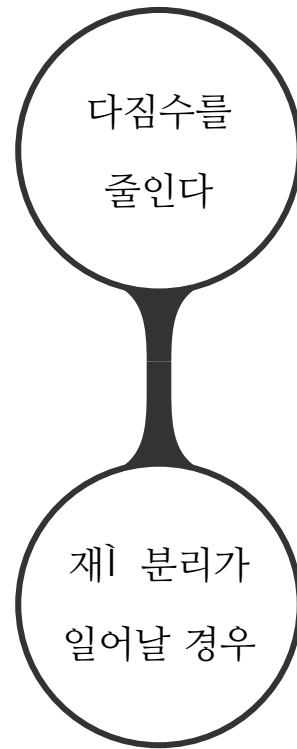
- clockwise from = 30



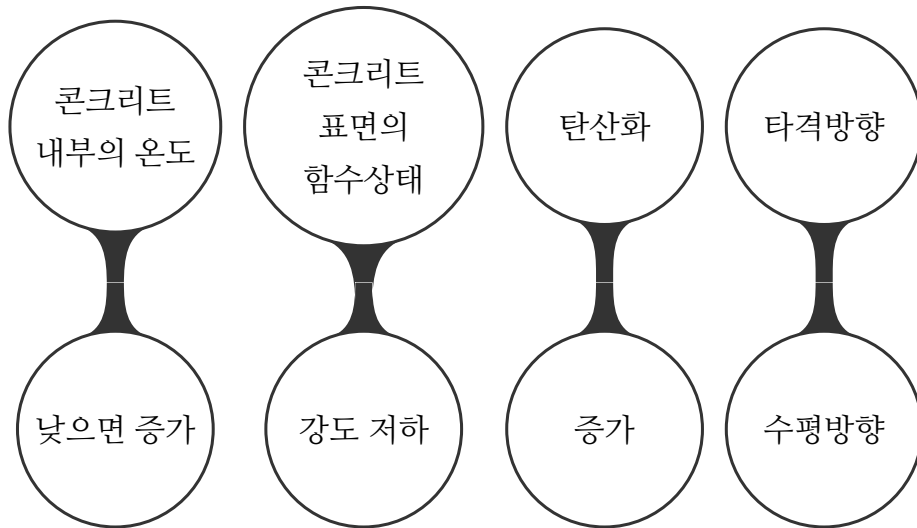
- clockwise from = 90



■ 수직 2단



■ 수직 2단 4열 small mindmap



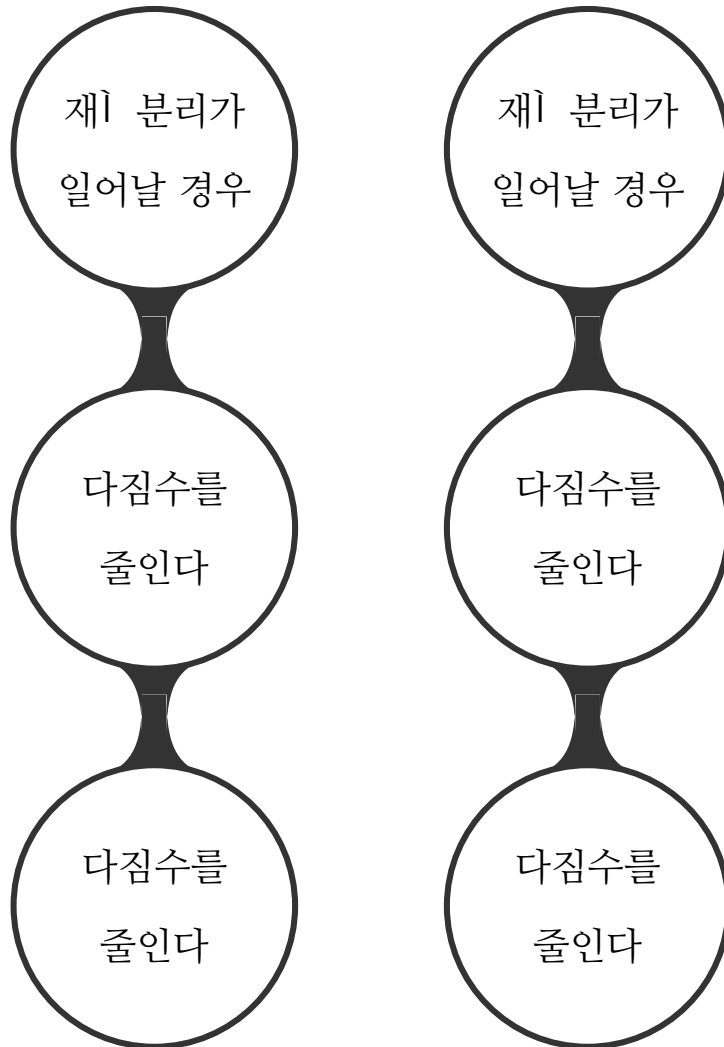
■ 수평 3단



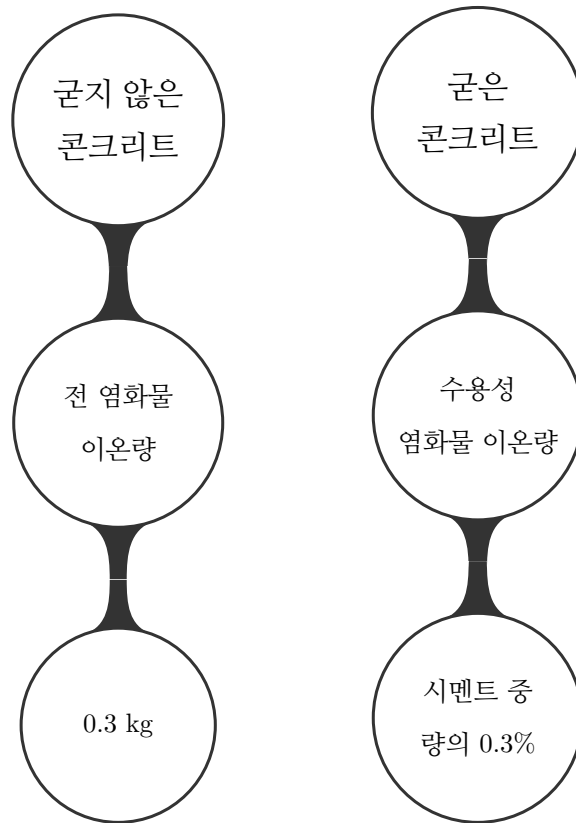
■ 수직 3단

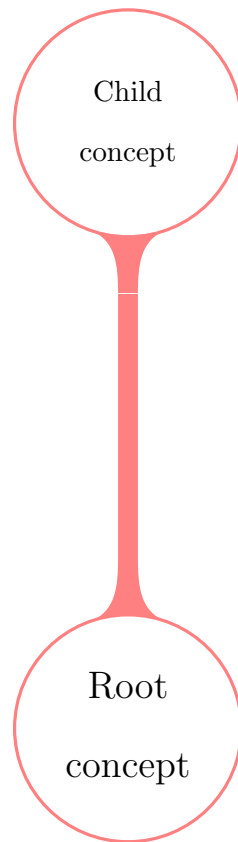


■ 수직 3단 2열

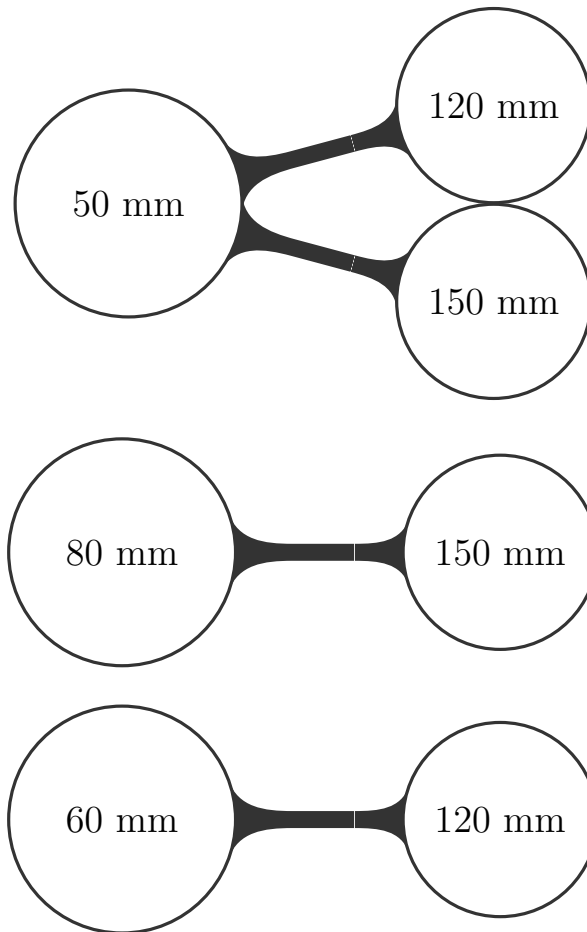


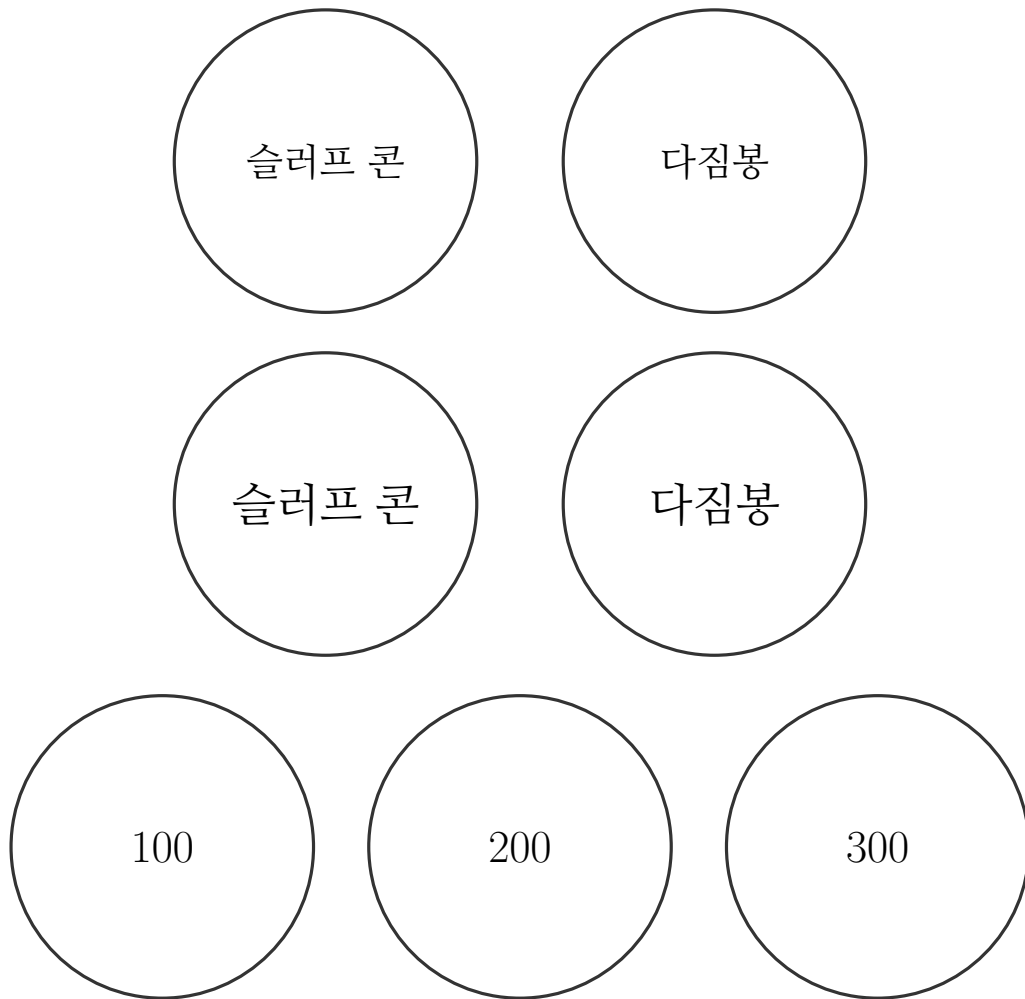
■ 수직 3단 2열 small mindmap





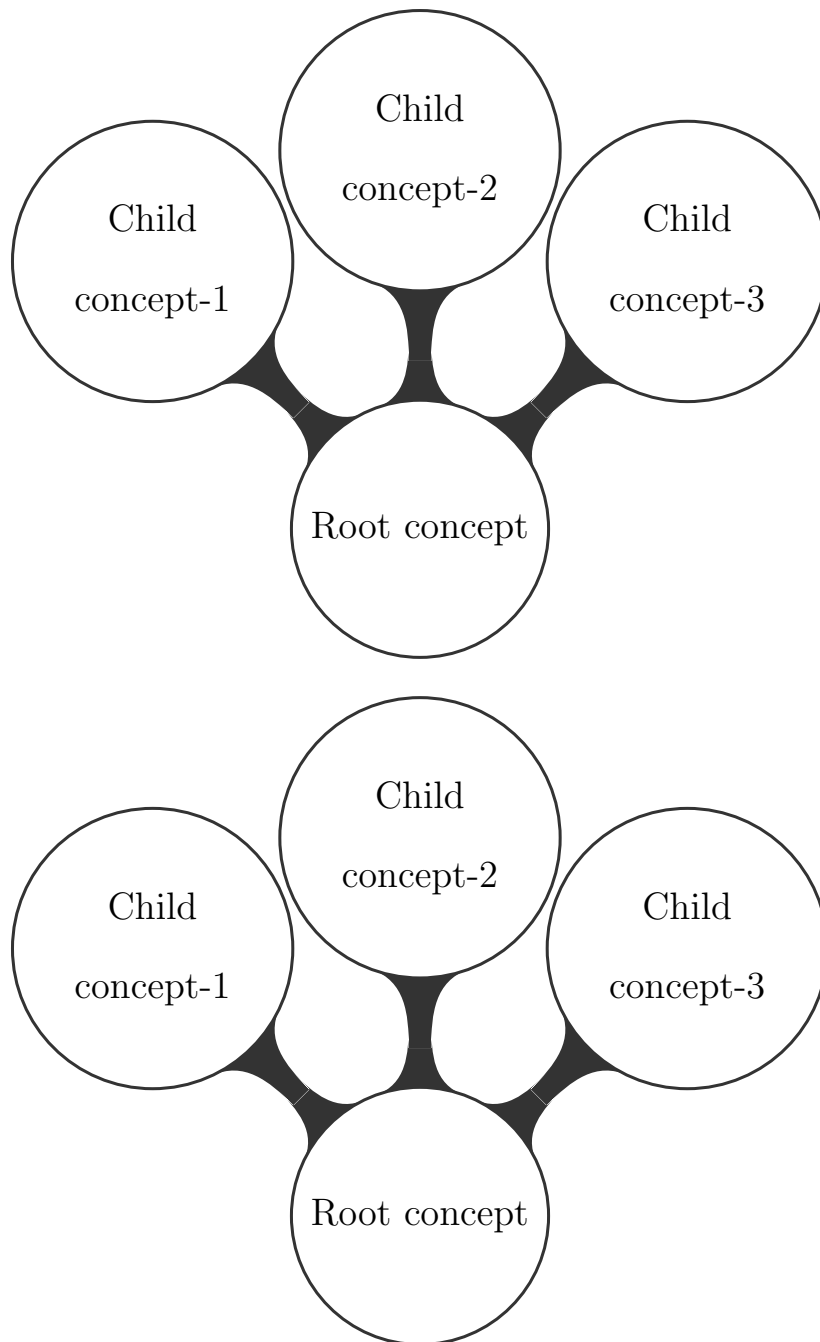
■ 3줄



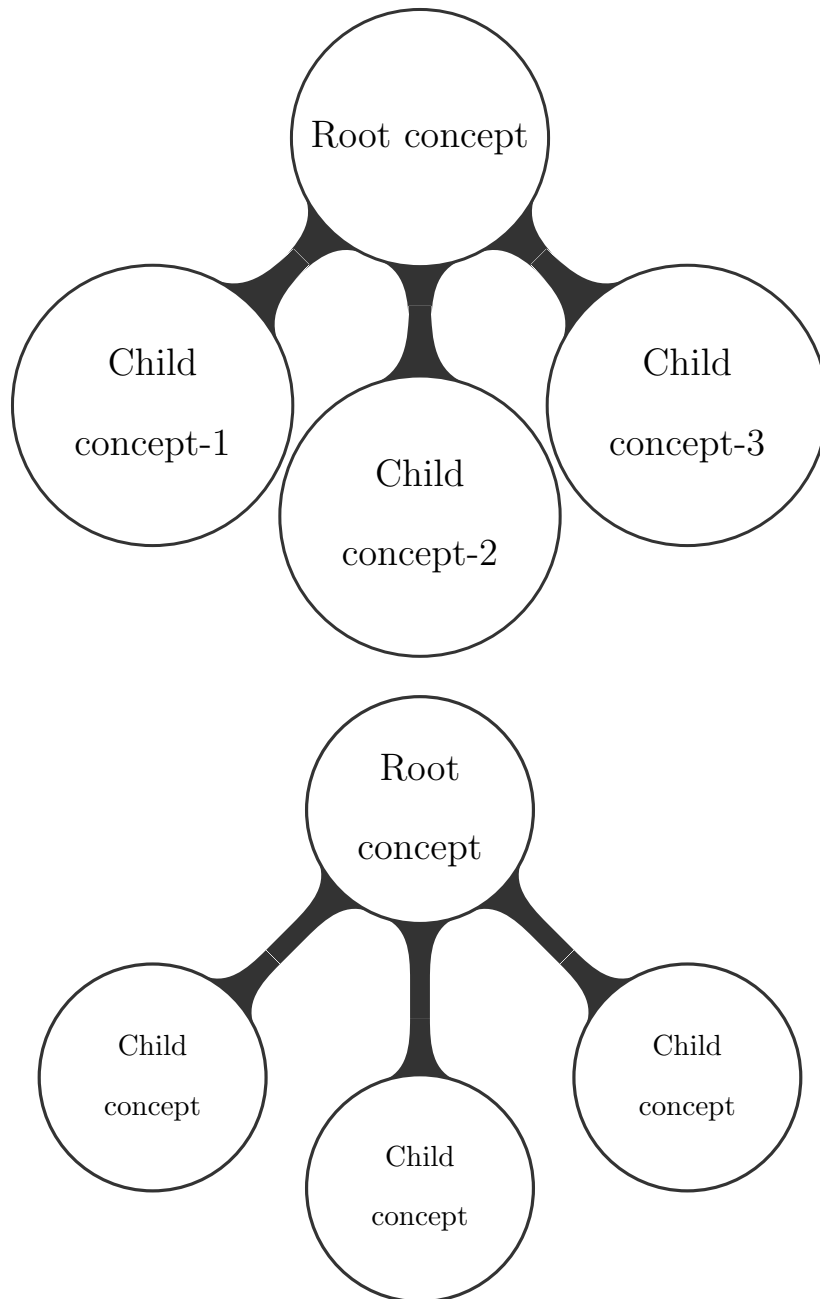


20. mind map : 사용예 - 원 셋

■ 상향 3개

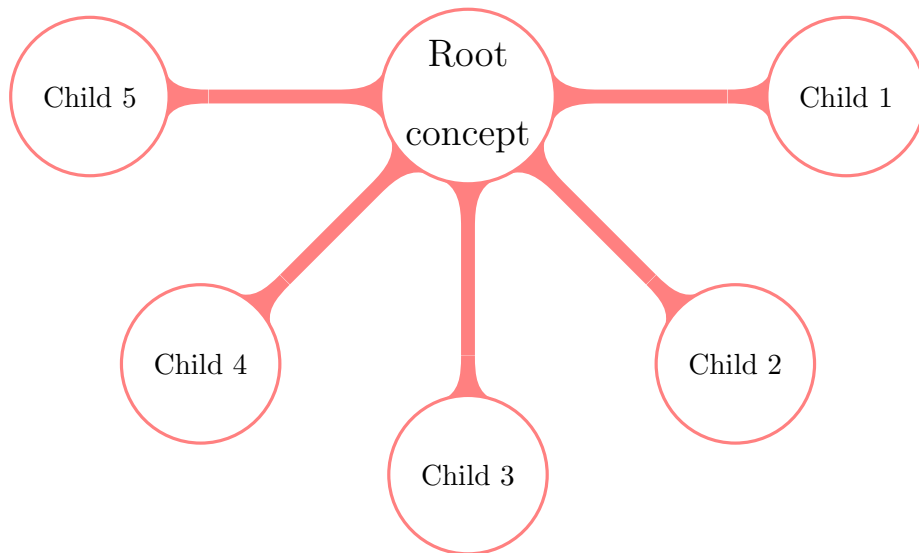


■ 하향 3개

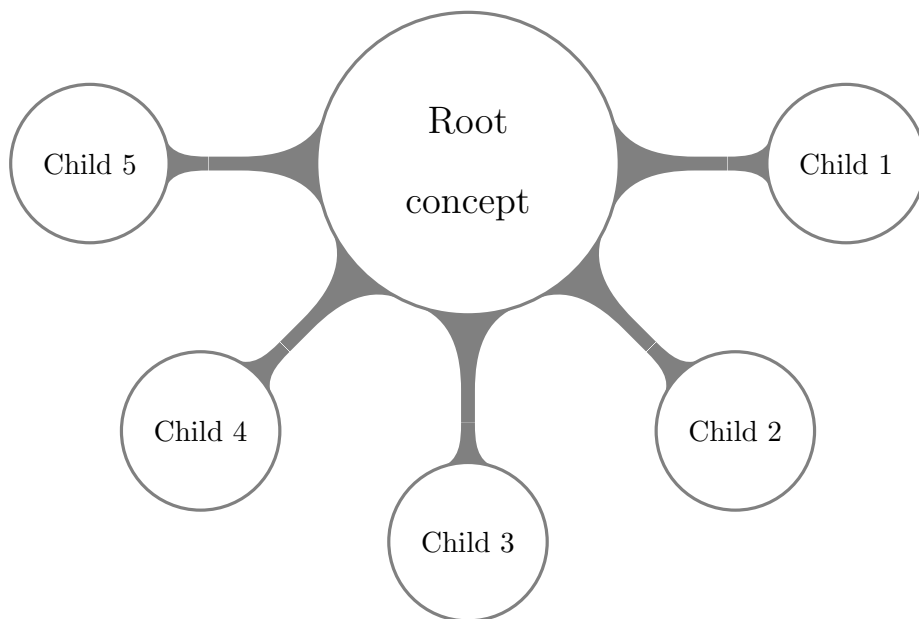


21. mind map : 사용예 - 원 다섯

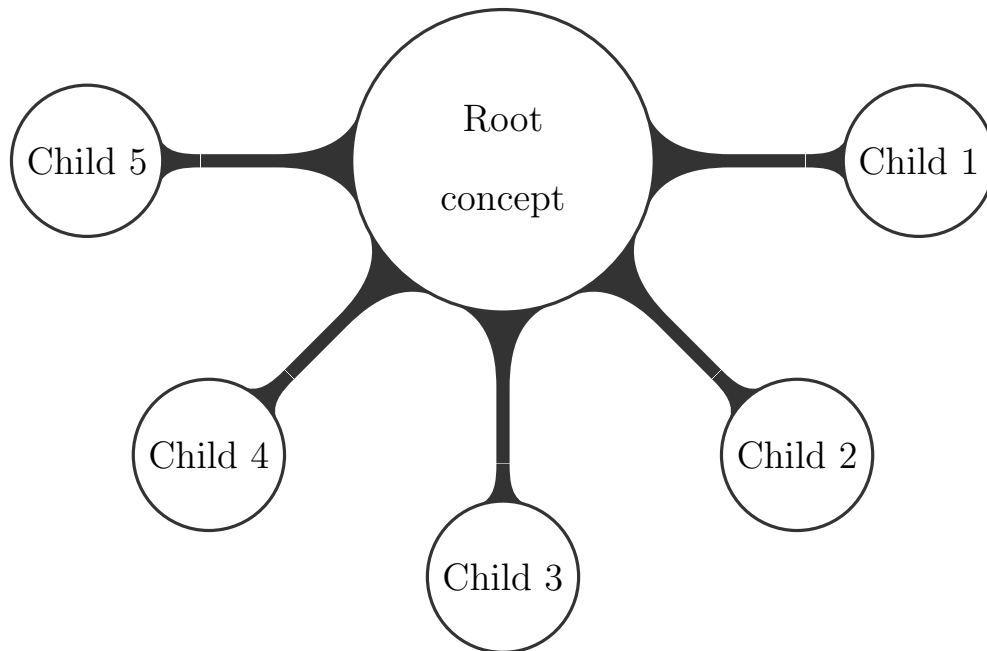
■ 하향 5개



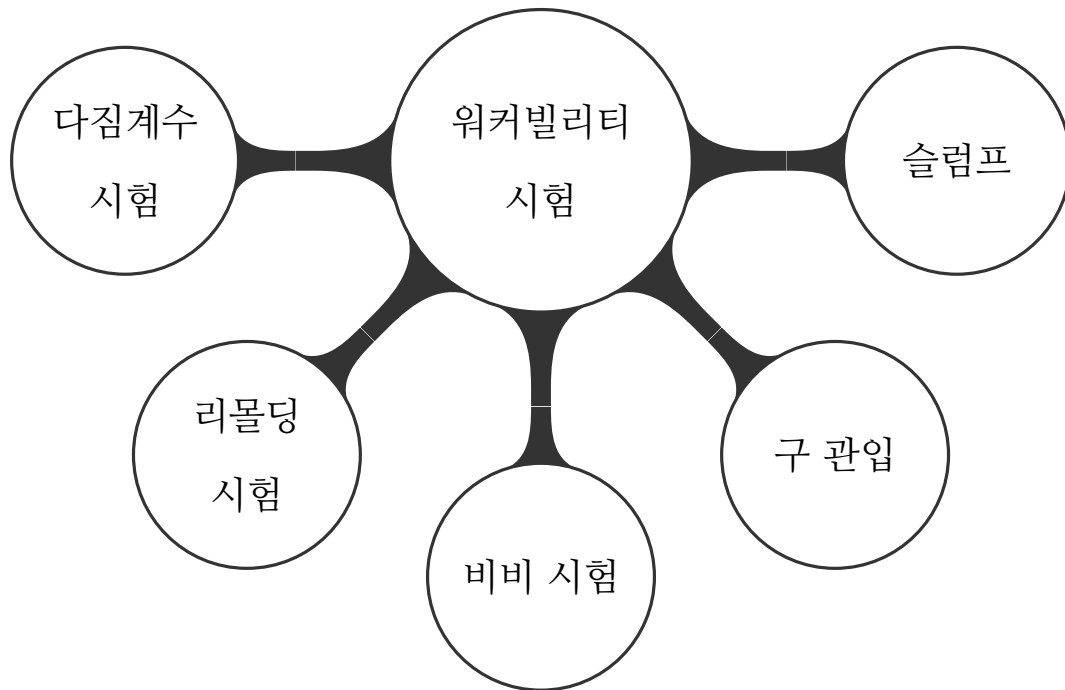
■ 하향 5개



■ 하향 5개



■ 하향 5개



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