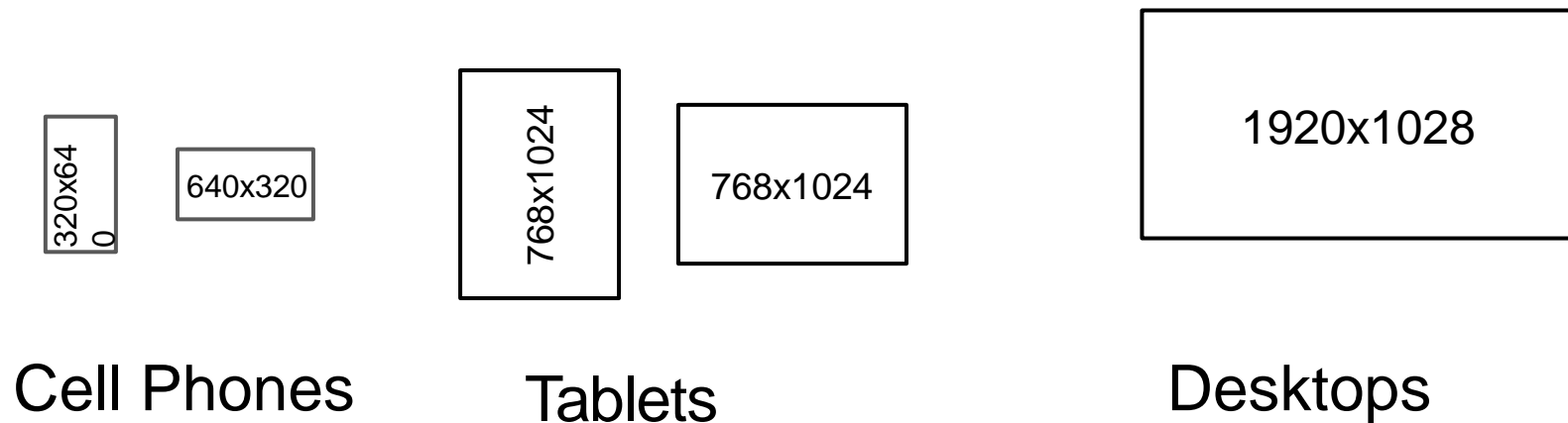


# Responsive Web Design

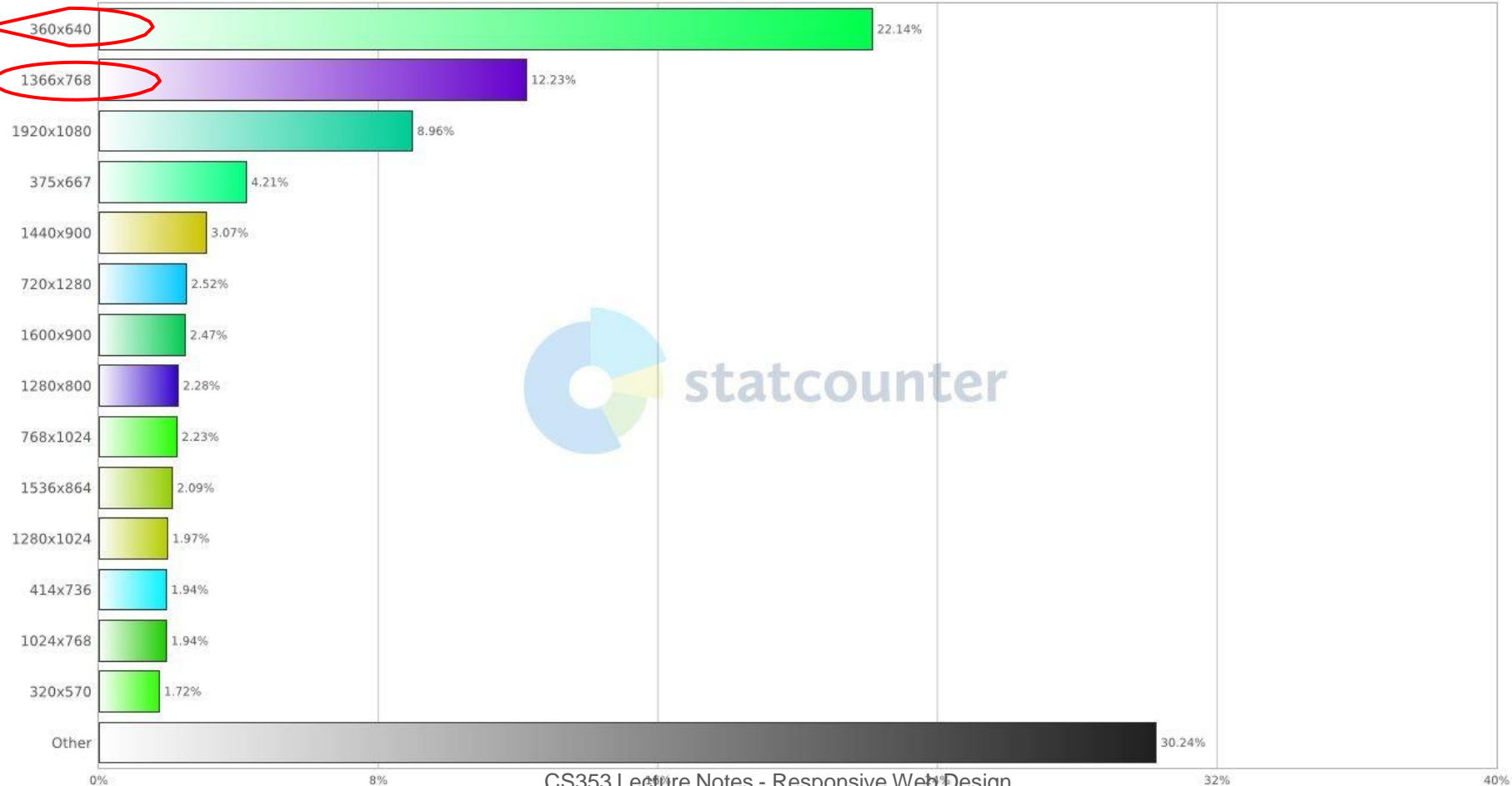
[https://www.w3schools.com/css/css\\_rwd\\_intro.asp](https://www.w3schools.com/css/css_rwd_intro.asp)  
[https://www.w3schools.com/html/html\\_responsive.asp](https://www.w3schools.com/html/html_responsive.asp)

# Web App Challenges: Screen real estate



- Do we need to build N versions of each web application?

StatCounter Global Stats  
Screen Resolution Stats Worldwide on 26 Apr 2018



# Responsive Web Design

- Content is like water!
  - The web app should flow into and fill whatever device you have.
- Possible with CSS extensions:
  - Add grid layout system with relative (e.g. 50%) rather than absolute (e.g. 50pt) measures
    - Specify element packing into columns and rows
  - Add @media rules based on screen sizes
    - Switch layout based on screen size
  - Made images support relative sizes
    - Autoscale image and videos to fit in screen region

```
img { width: 100%; height: auto; }  
video { width: 100%; height: auto; }
```

# Example of Responsive Web Layout

Menu #1 - 25%	Menu #2 - 25%	Menu #3 - 25%	Menu #4 - 25%
Nav #1 - 25%	View component - 75%		
Nav #2 - 25%			
Nav #3 - 25%			
Footer - 100%			

Menu #1 - 25%	Menu #2 - 25%	Menu #3 - 25%	Menu #4 - 25%
Nav #1 - 25%	View component - 75%		
Nav #2 - 25%			
Nav #3 - 25%			
Footer - 100%			

# CSS Breakpoints

## CSS Rules:

```
@media only screen and (min-width: 768px) {  
    /* tablets and desktop layout */  
}
```

```
@media only screen and (max-width: 767px) {  
    /* phones */  
}
```

```
@media only screen and (max-width:  
    767px) and (orientation: portrait) {  
    /* portrait phones */  
}
```

Menu #1 - 100%	
Menu #2 - 100%	
Menu #3 - 100%	
Menu #4 - 100%	
Nav #1 - 25%	Content - 100%
Nav #2 - 25%	
Nav #3 - 25%	
Footer - 100%	

# Responsive implementation

- Build components to operate at different screen sizes and densities
  - Use relative rather than absolute
  - Specify sizes in device independent units
- Use CSS breakpoints to control layout and functionality
  - Layout alternatives
  - App functionality conditional on available screen real estate
- Mobile first popular
  - Expand a good mobile design to use more real estate