以下题目答题时间为3天，可以使用网络。

请在github上创建一个公开项目，将以下答案上传后，提供访问链接。

提示：尽量答，不用怕错。

1). 广告的可见率

阅读以下关于广告可见率数据的描述，回答问题。

注意：Active View 是 Google 的广告可见率衡量解决方案，用于跟踪由 AdSense 投放的广告的可见率。

Active View data in reporting

Active View is Google's ad viewability measurement solution, tracking the viewability of ads served by AdSense. Viewability helps determine how likely it is that an ad was actually seen by a user. An ad is counted as viewable if at least 50% of its area was displayed on-screen for at least one second (the minimum criteria according to Interactive Advertising Bureau (IAB) standards). Two important factors are (a) what portion of an ad appears in a viewable space on screen and (b) how long that portion of the ad remains visible.

Measuring viewability helps publishers and advertisers assess the value of an impression. For example, consider a placement at the bottom of a webpage. If a user needs to scroll down to see the bottom of the page, the user might not see the ad before navigating away from the page. Yet for a user with a larger screen, the entire page might appear in a viewable space—which means the ad is visible, too. Both scenarios count as impressions, but only viewability tracks whether an ad actually became visible to the user.

You can use Active View data in reporting to help you increase the long-term value of your display inventory. For example, for impressions with a CPC bid type, Active View data gives you more information about how likely it is that a user will click on your ad; after all, your ads need to be viewed, to be to clicked. It also improves the attractiveness of your ad inventory to brand advertisers who want to know their ads actually have a chance of being seen, and typically pay higher RPMs for viewable impressions. Additionally, Active View data provides insight into which of your ad units or areas of your site have the highest and lowest viewable rates and where you should concentrate your efforts on improving viewability, e.g., by looking at your Ad units or Custom channels reports.

问题

- 1). Active View由哪几个因素决定?
- 2). Active View(广告可见率)和Impression(广告展示) 这两个指标有什么区别?
- 3). 对于一个主要面向移动设备的网站(90%以上用户使用手机访问)，可能提高广告的可见率有哪些方法?

2). 网页性能指标

网页性能对于用户体验至关重要，进而也会影响网站的变现效率。

阅读以下谷歌提出的LCP指标的描述，回答问题。

History

Historically, it's been a challenge for web developers to measure how quickly the main content of a web page loads and is visible to users.

Older metrics like load or DOMContentLoaded are not good because they don't necessarily correspond to what the user sees on their screen. And newer, user-centric performance metrics like First Contentful Paint (FCP) only capture the very beginning of the loading experience. If a page shows a splash screen or displays a loading indicator, this moment is not very relevant to the user.

In the past we've recommended performance metrics like First Meaningful Paint (FMP) and Speed Index (SI) (both available in Lighthouse) to help capture more of the loading experience after the initial paint, but these metrics are complex, hard to explain, and often wrong—meaning they still do not identify when the main content of the page has loaded.

Sometimes simpler is better. Based on discussions in the W3C Web Performance Working Group and research done at Google, we've found that a more accurate way to measure when the main content of a page is loaded is to look at when the largest element was rendered.

What is LCP?

The Largest Contentful Paint (LCP) metric reports the render time of the largest image or text block visible within the viewport, relative to when the page first started loading.

What is a good LCP score?

To provide a good user experience, sites should strive to have Largest Contentful Paint of 2.5 seconds or less. To ensure you're hitting this target for most of your users, a good threshold to measure is the 75th percentile of page loads, segmented across mobile and desktop devices.

问题

- 1). LCP指标是指什么？健康的LCP指标是一个什么样的标准?
- 2). 除了LCP文中还提到了那些指标，请列出3个，并解释他们的不足之处。
- 3). 根据文中对LCP的描述，在开发Web网站时，有哪些提高LCP的措施?

3). tidy.js

tidy.js是一个用JavaScript实现的数据分析工具库，可以很方便地操作对象数组。

关于tidy.js

https://pbeshai.github.io/tidy/docs/getting_started

数据

这是一份AdSense关于不同网站的广告数据。

https://docs.google.com/spreadsheets/d/146NrJetWRjnUMc9q0aSOYh487o_NwmxY_r7FWLo7B1Q/edit?usp=sharing

解释

- 有效访问网站 = 网页访问量大于等于100的网站

要求

- 1). 以下结果的计算过程必须使用tidy.js编程实现
- 2). 在github上创建一个公开项目，将代码提交后提供访问链接
- 3). 在README.md描述文件中介绍项目的使用方法，附上输出结果。

问题

- 1). 计算出每个网站的点击率CTR，并按照CTR从高到底排序。
  CTR的计算公式是: CTR = Clicks/Impressions
- 2). 计算所有有效访问网站的总PV，总广告展示次数，总广告点击率，综合点击率CTR
- 3). 找出有效访问网站中，广告可见率低于50%的网站，这些网站的广告可能存在问题。
- 4). [可选] 计算所有有效网站中，各个网站的PV在总PV中的占比 pv_percent。