For each of the following scenarios, call out the potential biases in the proposed experiment. Do your best to try to discover not only the bias, but the initial design. There is plenty of room for interpretation here, so make sure to state what assumptions you're making.

* You're testing advertising emails for a bathing suit company and you test one version of the email in February and the other in May.
* You open a clinic to treat anxiety and find that the people who visit show a higher rate of anxiety than the general population.
* You launch a new ad billboard based campaign and see an increase in website visits in the first week.
* You launch a loyalty program but see no change in visits in the first week.

1. Bathing suit company advertisements. One version in February and the other version in May.

Bias is present in the timing of the advertisements/emails. Customers are already less likely to buy bathing suits in February when most places are cold and unhospitable to swimming in outdoor pools or beaches. May is leading up into Summer and people anticipating warmer weather will be more likely to be on the lookout for new swimwear.

1. Anxiety clinic visitors show higher rate of anxiety than the general population.

The bias is inherent to the location – only people with anxiety will be seeking treatment from a clinic.

1. New billboard ad campaign and website visits increase in the first week of posting.

Correlation is not causation. Where were the billboards placed? Is it possible to trace web site traffic to geography and somehow connect it with billboard placement? I.e. if the billboard is placed along an interstate highway with lots of travelers viewing it this might not be so easy – but if the billboard is placed in the middle of a town where mostly locals would see it then it might be possible to see if the increased web traffic is from that town.

1. Loyalty program launch yields no changes in visits in first week of launch.

A loyalty program is designed more towards customer retention rather than new customer traffic.