**Invariant Metrics:**

* **Number of services:** Number of cookies to view the course overview page
* **Number of clicks:** Number of unique cookies to click the “start free trial” button (happens before the free trial screener is trigger)
* **Click through probability:** Number of unique cookies to click the “start free trial” button (which happens before the free trial screener is trigger)

**Evaluation Metrics:**

* **Gross conversion:** Number of user-ids to complete checkout and enroll in “the free trial button” divided by number of unique cookies to view the course overview page.
* **Net Conversion:** Number of user-ids to remain enrolled past the 14-day boundary (and thus make at least one payment) divided by the number of unique cookies to click the “start free trial” button.

|  |  |
| --- | --- |
| Unique cookies to view page per day: | 40000 |
| Unique cookies to click "Start free trial" per day: | 3200 |
| Enrollments per day: | 660 |
| Click-through-probability on "Start free trial": | 0.08 |
| Probability of enrolling, given click: | 0.20625 |
| Probability of payment, given enroll: | 0.53 |
| Probability of payment, given click | 0.1093125 |

|  |  |
| --- | --- |
| **Metric Choice** | **dmin** |
| Number of cookies | 3000 |
| Number of user-ids | 50 |
| Number of clicks | 240 |
| Click-through-probability | 0.01 |
| Gross conversion | 0.01 |
| Retention | 0.01 |
| Net conversion | 0.0075 |

**Analytical stand deviation**

Number of clicks: 5000\*0.08 = 400

Number of enrollment: 400 \* 0.2625 = 82.5

* **Gross Conversion:**

= = 0.0202

* **Retention:**

= = 0.0549

* **Net Conversion:**

= = 0.0156

**Sample Size:**

I used this [online calculator](http://www.evanmiller.org/ab-testing/sample-size.html) for

* **Gross Conversion:**
* Baseline Conversion: 20.625%
* Minimum Detectable Effect: 1%
* alpha: 5%
* beta: 20%
* 1 - beta: 80%
* sample size = 25,835 enrollments/group
* Number of groups = 2 (experiment and control)
* total sample size = 51,670 enrollments
* clicks/pageview: 3200/40000 = .08 clicks/pageview
* pageviews = 645,875
* **Retention**
* Baseline Conversion: 53%
* Minimum Detectable Effect: 1%
* alpha: 5%
* beta: 20%
* 1 - beta: 80%
* sample size = 39,155 enrollments/group
* Number of groups = 2 (experiment and control)
* total sample size = 78,230 enrollments
* enrollments/pageview: 660/40000 = .0165 enrollments/pageview
* pageviews = 78,230/.0165 = 4,741,212
* **Net Conversion**
* Baseline Conversion: 10.9313%
* Minimum Detectable Effect: .75%
* alpha: 5%
* beta: 20%
* 1 - beta: 80%
* sample size = 27,413 enrollments/group
* Number of groups = 2 (experiment and control)
* total sample size = 54,826
* clicks/pageview: 3200/40000 = .08 clicks/pageview
* pageviews = 685,325