

You are a Data Analyst for a company which produces a new generation of electric men razor. Your company registered an e-commerce site 1 month ago to sell its product online instead of the traditional supermarket channel. During the last month, it piloted advertising on 2 channels:

- Email Channel
- SMS Channel

Data are extracted from a centralized database and stored in the attached file called “extracted_data.csv”.

Dataset

The schema for this dataset is as follow:

id	Format: Integer, representing each message
send_date	Format: data, date when sms/Email was sent
estimated_age	Format: Integer, ranging from 0 to 100
age_range	Format: string. Audience is divided into 4 age ranges
channel	Format: string, either SMS or Email
coupon	Format: float, the value of coupon expressed in each message, valid for up to 3 units for each order
clicked	Format: binary, either 0 (customer doesn't click on the link in SMS/Email) or 1 (they clicked)
last_step	Format: string. It can have one of the following values: “received”, “bounced”, “saw review”, “added to cart”, “payment page”, “purchased”
nb_units	Format: integer, representing the number of units of customers' order.
order_value	Format: float, representing value of the order customer made. Already minus the coupon applied.

The column “last_step” is the final point of contact with customers before they leave our website. Its values are explained below:

- Received: sms/email sent successfully, but no clicked.
- Bounced: they clicked but exited immediately.
- Saw review: scroll down and read the review and information of the product
- Added to cart: customers added the product to cart to check out
- Payment page: They stopped at payment without finishing it
- Purchased: They made an order

Financial Information

Together with the data above, you have additional information about the production cost and the marketing campaigns.

- Production cost for each razor is 18\$.
- Cost per one SMS is \$0.050, cost per one email sent is \$0.075.
- Each email or SMS will be supplied a coupon which can have value of 2\$, 4\$ or 6\$. Coupon is valid for up to 3 razors in each order. They have the option to wrap the items as gift. Ignore wrapping and shipping costs.
- The price without coupon is 40\$ / razor.
- From experience (and some models), potential customers are divided into 4 age groups:
 - 18 - 30
 - 31 - 45
 - 46 - 60
 - 60 +

Question

2.a. For the next quarter, your marketing department has a budget of \$60,000 to spend on online campaigns. How would you allocate it between SMS and Email? Assume that we have potential customer pool for each age group as below:

Age Group	Pool size
18 - 30	300,000
31 - 45	350,000
46 - 60	500,000
60+	200,000

2.b. Now assume that you are also responsible for the operation of the company's website. Do you have any comments or suggestions so that we can improve the website's performance in order to maximize net profit?