**Test Cases**

**Hard-coded example**

Here is the initialization of a Budget called “Cash”

Budget cash(USD, FEB, 10000, 40, 40, 20);

cash.addEvent(Event(USD, FIXED, 1000, "Event 1", "I do hope this works", FEB, 1));

cash.addEvent(Event(USD, VARIABLE, 2200, "Event 2", "double trouble!", FEB, 2));

cash.addEvent(Event(USD, FIXED, 331, "Event 3", "Groceries with mom", FEB, 3));

cash.addEvent(Event(USD, SAVINGS, 39.439, "Event 4", "My attempt at savings", FEB, 4));

cash.addEvent(Event(USD, VARIABLE, 22, "Event 5", "Sophie's gift", FEB, 5));

cash.addEvent(Event(USD, SAVINGS, 11.208765, "Event 6", "Hallelujah", FEB, 6));

So we have a Budget that measures American Dollars for the month of February that has $10,000 of after-tax income and intends to allocate 40% of it to fixed spendings, 40% of it to variable spendings, and 20% of it to savings.

That means we should have 10000(.4) = $4000 allocated for fixed spendings, 10000(.4) = $4000 allocated for variable spendings, and 10000(.2) = $2000 allocated for savings. When Cash is printed, what do the money allocation numbers on the bottom right say?

After all these events are added, lets calculate how much is spent for each spending category. In total, there are 6 events, 2 of each spending type. I chose the number 6 to test the resizing function of Budget. The Initial capacity of the budget’s backing array is only 5, thus having 6 events guarantees a call to resizing. When Cash is printed, let’s see if all 6 events are printed and accounted for.

Alright. For fixed spendings, we have Events 1 and 3, whose values are 1000 + 331 = $1331. Out of the $4000 allocated for fixed spendings, we have spent 1331 / 4000 = 33.28% (round to the nearest hundredth) of our allocated money and have 4000 – 1331 = $2669 left, which is 2669 / 4000 = 66.73% (round to the nearest hundredth). What does our budget say?

For variable spendings, we have Events 2 and 5, whose values are 2200 + 22 = $2222. Out of the $4000 allocated for variable spendings, we have spent 2222 / 4000 = 55.55% of our allocated money and have 4000 – 2222 = $1778 left, which is 1778 / 4000 = 44.45%. 55.55% + 44.45% = 100%. What does our budget say?

For savings, we have Events 4 and 6, whose values are 39.439 => 39.44 + 11.208765 => 11.21 = $50.65. Out of the $2000 allocated for savings, we have used 50.65 / 2000 = 2.53% of our allocated money and have 2000 – 50.65 = $1949.35 left, which is 1949.35 / 2000 = 97.47% (round to the nearest hundredth). What does our budget say?

In total, we have spent 1331 + 2222 + 50.65 = $3603.65, which is 3603.65 / 10000 = 36.04% of our entire after-tax income, and we have 10000 - 3603.65 = $6396.35 left, which is 6396.35 / 10000 = 63.96% of our after-tax income. What does our budget say?

As an exercise to the user, they can also uncomment the other operations to cash such as deleteEvent() for all 3 spending types, changeEventAmount() for all 3 spending types, changeEventType for all 6 spending type combinations (3 options for old *Spending\_Cat*, 2 options for new *Spending\_Cat*, thus 3 \* 2 = 6), changeEventName(), changeEventNote(), changeConditionalP() to the default setting, changeAfterTaxIncome by doubling it, and changeCurrency from USD to CNY.

In addition to the hard-coded example that is commented out, you can also enter in this exact budget through cin >> cash. All the results will be the exact same as the commented-out version.