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GitHub link: https://github.com/ehsankhiabanifard/CSA-07-Project

To do this project, I first carefully studied websites in the resource section and then combined the knowledge gained with what I had learned in the class.

The question says that you started drinking coffee from Tim Horton's since January 2020 an average you spend $6.45 each visit 3 time during the week to Tim Horton's till now.

Now, I want to calculate the average revenue per user. (I go to the cafe 3 times a week and 12 times a month.)

Customer Value (month) = (average value of a sale) x (average number of transactions)

CV (month) = $6.45 * 12 = **$77.4**

CV (year) = $77.4 * 12 = **928.8**

Life time value = (average value of sale) x (average number of transactions) x (retention time period)

Or Life time value = CV x (retention time period)

(From January 2020 to today, about three years and three months have passed)

Average value of sale = $6.45

Average number of transactions = 12 per month

Retention time period = 3 years and 3 months = 39 months

LTV = $6.45 x 12 x 39 = **$3018.6**

Now if it's a 25% profit margin, that's an average profit of $1.6125 per visit.

CV (day): $1.6125. And CV (week): 4.8375.

 CV (month): 19.35 and LTV = $1.6125x 12 x 39 = **$754.65**

With these calculations, Tim Horton's knows how much I'm worth. How much profit have they made so far and how much profit will I have for them if I want to continue buying.

For the third part of the project, I want to use the R programming language to create hypothetical data for 5 customers and then perform calculations on these data.

In the first step, I need some data, so I created a data frame with hypothetical data of 5 customers from 2020 to 2023, and I used nested loops and random numbers to fill it.

	customer_id <chr>	pay_amount <dbl>	date <chr>
2	C00-2	82	2020-01-01
3	C00-3	91	2020-01-04
4	C00-1	76	2020-01-05
5	C00-4	64	2020-01-08
6	C00-3	80	2020-01-09
7	C00-2	97	2020-01-10
8	C00-4	69	2020-01-13
9	C00-3	83	2020-01-15
10	C00-5	77	2020-01-18
11	C00-3	89	2020-01-21

1-10 of 527 rows   Previous 1 2 3 4 5 6 … 53 Next

Now I want to have the profit margin of 25% as a column in the data frame.

	customer_id <chr>	pay_amount <dbl>	date <chr>	profit_marigin <dbl>
2	C00-2	82	2020-01-01	20.50
3	C00-3	91	2020-01-04	22.75
4	C00-1	76	2020-01-05	19.00
5	C00-4	64	2020-01-08	16.00
6	C00-3	80	2020-01-09	20.00
7	C00-2	97	2020-01-10	24.25
8	C00-4	69	2020-01-13	17.25
9	C00-3	83	2020-01-15	20.75
10	C00-5	77	2020-01-18	19.25
11	C00-3	89	2020-01-21	22.25

1-10 of 527 rows   Previous 1 2 3 4 5 6 ... 53 Next

Now we extract some required information!

```{r}
cat("When is the beginning and end of this information? ",range(payments$date, na.rm = TRUE))
cat("\n\nHow many customers do we have in total? ", length(levels(factor(payments$customer_id))), " people")
cat("\n\nWhat was our total income? $", sum(payments$pay_amount),sep = "")
cat("\n\nWhat was our total profit? $", sum(payments$profit_marigin),sep = "")

avr<- sum(payments$pay_amount)/ length(payments$pay_amount)
cat("\n\nHow much does each customer buy on average in each transaction? $", avr,sep = "")

avr<- sum(payments$profit_marigin)/ length(payments$profit_marigin)
cat("\n\nAverage profit per customer per transaction? $", avr,sep = "")

|

```

```
when is the beginning and end of this information?  2020-01-01 2022-12-29

How many customers do we have in total?  5  people

What was our total income? $38958

What was our total profit? $9739.5

How much does each customer buy on average in each transaction? $73.9241

Average profit per customer per transaction? $18.48102
```

We still need more information.

```
get_user_info<- function(customer_id_str)
{
    user_info<- subset(payments, customer_id == customer_id_str )

result<- c(sum(user_info$pay_amount),length(user_info$pay_amount))

return(result)
}
```

```r
cat("\nThe total revenue received from customers is as follows\n---------------------------------")
usinfo<- get_user_info("C00-1")
cat("\nC00-1 total payment: $", usinfo[1]," and sum of transactions:", usinfo[2],sep = "")
usinfo<- get_user_info("C00-2")
cat("\nC00-2 total payment: $", usinfo[1]," and sum of transactions:", usinfo[2],sep = "")
usinfo<- get_user_info("C00-3")
cat("\nC00-3 total payment: $", usinfo[1]," and sum of transactions:", usinfo[2],sep = "")
usinfo<- get_user_info("C00-4")
cat("\nC00-4 total payment: $", usinfo[1]," and sum of transactions:", usinfo[2],sep = "")
usinfo<- get_user_info("C00-5")
cat("\nC00-5 total payment: $", usinfo[1]," and sum of transactions:", usinfo[2],"\n",sep = "")

cat("\nIf we divide the number of transactions by 36 months, the average is obtained.\n---------------------------------")

number_of_transactions<- length(payments$customer_id)
usinfo<- get_user_info("C00-1")
cat("\nC00-1 Average payment per month: $", usinfo[1]/number_of_transactions," Average transaction per month:",
usinfo[2]/36,sep = "")
usinfo<- get_user_info("C00-2")
cat("\nC00-2 Average payment per month: $", usinfo[1]/number_of_transactions," Average transaction per month:",
usinfo[2]/36,sep = "")
usinfo<- get_user_info("C00-3")
cat("\nC00-3 Average payment per month: $", usinfo[1]/number_of_transactions," Average transaction per month:",
usinfo[2]/36,sep = "")
usinfo<- get_user_info("C00-4")
cat("\nC00-4 Average payment per month: $", usinfo[1]/number_of_transactions," Average transaction per month:",
usinfo[2]/36,sep = "")
usinfo<- get_user_info("C00-5")
cat("\nC00-5 Average payment per month: $", usinfo[1]/number_of_transactions, " Average transaction per month:",
usinfo[2]/36,"\n",sep = "")
```

We can see the result in the box below.

```
The total revenue received from customers is as follows
---------------------------------
C00-1 total payment: $4994 and sum of transactions:66
C00-2 total payment: $8277 and sum of transactions:112
C00-3 total payment: $8577 and sum of transactions:119
C00-4 total payment: $12350 and sum of transactions:167
C00-5 total payment: $4760 and sum of transactions:63

If we divide the number of transactions by 36 months, the average is obtained.
---------------------------------
C00-1 Average payment per month: $9.476281 Average transaction per month:1.833333
C00-2 Average payment per month: $15.70588 Average transaction per month:3.111111
C00-3 Average payment per month: $16.27514 Average transaction per month:3.305556
C00-4 Average payment per month: $23.43454 Average transaction per month:4.638889
C00-5 Average payment per month: $9.032258 Average transaction per month:1.75
```

Now we know the average money and the number of times each customer comes to the cafe. Now we want to have an overall average of all customers.

```r
average_total_income<- sum(payments$pay_amount) / length(payments$pay_amount)
average_transaction_monthly<-  length(payments$pay_amount) / 36

cat("Average monthly income :$",average_total_income,"\n",sep = "")
cat("Average monthly transaction :$",average_transaction_monthly,"\n",sep = "")
```

```
Average monthly income :$73.9241
Average monthly transaction :$14.63889
```

And if we divide by the number of customers

```r
average_total_income<- sum(payments$pay_amount) / length(payments$pay_amount)
average_transaction_monthly<-  length(payments$pay_amount) / 36

cat("Average monthly income per client :$",average_total_income/5,"\n",sep = "")
cat("Average monthly transaction per client :",average_transaction_monthly/5,"\n",sep = "")
```

```
Average monthly income per client :$14.78482
Average monthly transaction per client :2.927778
```

Let's get to the point and calculate CLTV

Average purchase value (APV) = Total revenue / Number of transactions.

Average purchase frequency rate (APFR) = Number of transactions / Number of unique customers.

Customer value (CV) = APV / APFR.

Average customer lifetime (ACL) = Total customer lifetime / Number of customers.

Customer lifetime value (CLTV) = CV * ACL.

```r
#Average purchase value (APV) = Total revenue / Number of transactions.
APV<- sum(payments$pay_amount) / length(payments$pay_amount)

#Average purchase frequency rate (APFR) = Number of transactions / Number of unique customers.

APFR<- length(payments$pay_amount) / 5

#Customer value (CV) = APV / APFR.

CV<-APV / APFR

#Average customer lifetime (ACL) = Total customer lifetime / Number of customers.
# months / 5

ACL<- 36 / 5;

#Customer lifetime value (CLTV) = CV * ACL.

CLTV<- CV * ACL

print(CLTV)
```

For sure, I have not been careful enough during the calculations in doing this project and I accept the possibility that I have made mistakes.

Anyway, this course has been very useful for me and I appreciate and thank you as my teacher and coach.

Also, the original project can be uploaded on GitHub and can be accessed from the link below.

https://github.com/ehsankhiabanifard/CSA-07-Project