IIT Madras

ONLINE DEGREE
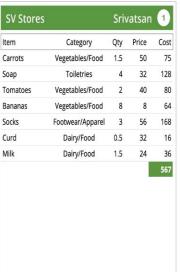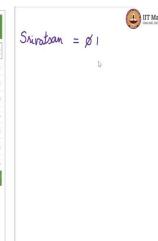
(Refer Slide Time: 0:14)

Hello CT students. In lecture 15 professor Madhavan Mukund had shown the procedure to find the frequency of every individual word in the paragraph. So, for each new word we encounter, we declare a new variable, keep its frequency 0 and incremented by 1. And when we come to a word which is already there whose frequency was already 1, then we increment it to 2. So, this way we keep increasing the frequency every time we see the word again. And when we find a new word we add a new variable, initialize it to 0 and increment it by 1. We are going to do a similar procedure now with the shopping bill dataset.
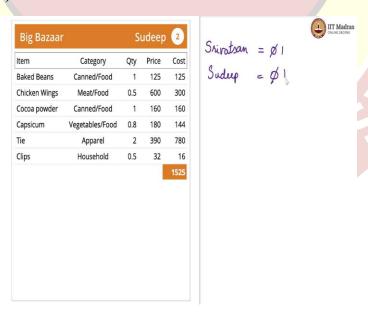
SV Stores			Srivatsan	1
Item	Category	Qty	Price	Cost
Carrots	Vegetables/Food	1.5	50	75
Soap	Toiletries	4	32	128
Tomatoes	Vegetables/Food	2	40	80
Bananas	Vegetables/Food	8	8	64
Socks	Footwear/Apparel	3	56	168
Curd	Dairy/Food	0.5	32	16
Milk	Dairy/Food	1.5	24	36
				567

Srivatsan = $\emptyset$ 1

We are going to find the number of bills per customer in this dataset. So, for this every time we encounter a new customer, we declare a new variable, initialize it to 0 and increment it by 1 and each time that customer shows up again we will increment that variable by 1. So, here let us begin we have Srivatsan, this is our first card Srivatsan for SV Stores. So, let us declare a variable for Srivatsan and we initialize it to 0 and then we increment it by 1.

Big Bazaar			Sudeep	2
Item	Category	Qty	Price	Cost
Baked Beans	Canned/Food	1	125	125
Chicken Wings	Meat/Food	0.5	600	300
Cocoa powder	Canned/Food	1	160	160
Capsicum	Vegetables/Food	0.8	180	144
Tie	Apparel	2	390	780
Clips	Household	0.5	32	16
				1525

Srivatsan = $\emptyset$ 1
Sudeep = $\emptyset$ 1

Now, we have Sudeep who again we initialize to 0 and increment by 1.

(Refer Slide Time: 1:51)

Item	Category	Qty	Price	Cost
Face Wash	Toiletries	1	89	89
Shampoo	Toiletries	1	140	140
Onions	Vegetables/Food	1	98	98
Bananas	Fruits/Food	4	8	32
Milk	Dairy/Food	1	24	24
Biscuits	Packed/Food	2	22	44
Maggi	Packed/Food	1	85	85
Horlicks	Packed/Food	1	270	270
Chips	Packed/Food	1	20	20
Chocolates	Packed/Food	4	10	40
Cereal	Packed/Food	1	220	220
Handwash	Toiletries	1	139	139
Air freshener	Toiletries	2	70	140
				1341

SV Stores — Akshaya — 3

Srivatsan = 0 1
Sudeep = 0 1
Akshaya = 0 1

Now, we have Akshaya, again 0, 1.

(Refer Slide Time: 1:59)

SV Stores — Advaith — 4

Item	Category	Qty	Price	Cost
Milk	Dairy/Food	2	24	48
Bread	Packed/Food	1	30	30
Eggs	Food	1	45	45
				123

Srivatsan = 0 1
Sudeep = 0 1
Akshaya = 0 1
Advaith = 0 1

Then there is Advaith, again 0, 1.

Big Bazaar				Akshaya 5
Item	Category	Qty	Price	Cost
Trousers	Women/Apparel	2	870	1740
Shirts	Women/Apparel	1	1350	1350
Detergent	Household	0.5	270	135
Tee shirts	Women/Apparel	4	220	880
Instant Noodles	Canned/Food	3	23	69
				4174

Srivatsan = Ø1
Sudeep = Ø1
Akshaya = Ø12
Advaith = Ø1

Now, there is Akshaya again, therefore 1 now becomes 2, so Akshaya variable is incremented by 1.

Sun General				Srivatsan 6
Item	Category	Qty	Price	Cost
Batteries	Utilities	6	14	84
USB Cable	Electronics	1	85	85
Ball Pens	Stationery	5	12	60
Onions	Vegetables/Food	1.25	100	125
				354

Srivatsan = Ø12
Sudeep = Ø1
Akshaya = Ø12
Advaith = Ø1

There is Srivatsan again, so srivatsan goes from 1 to 2.

(Refer Slide Time: 2:26)

	SV Stores		Akhil	7
Item	Category	Qty	Price	Cost
Bread	Packed/Food	1	30	30
Biscuits	Packed/Food	3	22	66
				96

Srivatsan = $\emptyset$ 12
Sudeep = $\emptyset$ 1
Akshaya = $\emptyset$ 12
Advaith = $\emptyset$ 1
Akhil = $\emptyset$ 1

Now, we have Akhil who is new. So, we have Akhil being 0 and then incremented to 1.

(Refer Slide Time: 2:38)

	Big Bazaar		Mohith	9
Item	Category	Qty	Price	Cost
Lindt	Chocolate/Food	1	125	125
Socks	Footwear/Apparel	1	120	120
Spring Onions	Vegetables/Food	0.5	220	110
Lettuce	Vegetables/Food	0.6	150	90
Cookies	Snacks/Food	2	75	150
				595

Srivatsan = $\emptyset$ 12
Sudeep = $\emptyset$ 1
Akshaya = $\emptyset$ 12
Advaith = $\emptyset$ 12
Akhil = $\emptyset$ 1

Advaith is back, so 1 is now incremented to 2.

Mohit is new so we have initialization to 0 and incrementing by 1.

(Refer Slide Time: 2:59)

And Rajesh is also new, we do the same thing which is initialized to 0, increment by 1.

(Refer Slide Time: 3:10)

SV Stores			Abhinav	11
Item	Category	Qty	Price	Cost
Chocolates	Packed/Food	1	10	10
Cereal	Packed/Food	1	220	220
Bananas	Fruits/Food	6	8	48
Tomatoes	Vegetables/Food	1	40	40
Curd	Dairy/Food	1	32	32
Milk	Dairy/Food	2	24	48
Horlicks	Packed/Food	1	270	270
Plates	Household	4	45	180
Eggs	Food	1	45	45
				893

Srivatsan = 0 12
Sudeep = 0 1
Akshaya = 0 2
Advaith = 0 2
Akhil = 0 1
Mohith = 0 1
Rajesh = 0 1
Abhinav = 0 1

And Abhinav is new, so 0 and then 1.

(Refer Slide Time: 3:19)

Sun General			Aparna	12
Item	Category	Qty	Price	Cost
Mosquito Coil	Household	2	24	48
Bananas	Fruits/Food	6	5	30
Ball Pens	Stationery	4	12	48
Paper Clips	Stationery	1	60	60
				186

Srivatsan = 0 12
Sudeep = 0 1
Akshaya = 0 2
Advaith = 0 2
Akhil = 0 1
Mohith = 0 1
Rajesh = 0 1
Abhinav = 0 1
Aparna = 0 1

Aparna is new, 0, 1.

(Refer Slide Time: 3:26)

Big Bazaar — Abhinav (13)

Item	Category	Qty	Price	Cost
Shoes	Footwear/Apparel	1	2700	2700
Polish	Footwear/Apparel	1	120	120
Socks	Footwear/Apparel	2	120	240
				3060

Srivatsan = 0.12
Sudeep = 01
Akshaya = 0.12
Advaith = 0.12
Akhil = 01
Mohith = 01
Rajesh = 01
Abhinav = 0.12
Aparna = 01

Abhinav is there already so we go from 1 to 2.

(Refer Slide Time: 3:32)

Sun General — Vignesh (14)

Item	Category	Qty	Price	Cost
Phone Charger	Utilities	1	230	230
Razor Blades	Grooming	1	12	12
Razor	Grooming	1	45	45
Shaving Lotion	Grooming	0.8	180	144
Earphones	Electronics	1	210	210
Pencils	Stationery	3	5	15
				656

Srivatsan = 0.12
Sudeep = 01
Akshaya = 0.12
Advaith = 0.12
Akhil = 01
Mohith = 01
Rajesh = 01
Abhinav = 0.12
Aparna = 01
Vignesh = 01

Vignesh is new, so we are now initializing to 0 and incrementing by 1.

Abhinav is there again, so Abhinav is probably the current maximum.

Advaith is there, Advaita is also on three right now.

(Refer Slide Time: 3:53)

SV Stores — George 17

Item	Category	Qty	Price	Cost
Cereal	Packed/Food	1	220	220
Milk	Dairy/Food	1	24	24
Cupcakes	Packed/Food	1	25	25
Chocolates	Packed/Food	1	10	10
				279

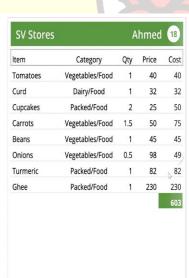Handwritten (IIT Madras Online Degree):

Srivatsan = $\cancel{0}\cancel{1}2$
Sudeep = $\cancel{0}1$
Akshaya = $\cancel{0}\cancel{1}2$
Advaith = $\cancel{0}\cancel{1}\cancel{2}3$
Akhil = $\cancel{0}1$
Mohith = $\cancel{0}1$
Rajesh = $\cancel{0}1$
Abhinav = $\cancel{0}\cancel{1}\cancel{2}3$
Aparna = $\cancel{0}1$
Vignesh = $\cancel{0}1$
George = $\cancel{0}1$

George is new, so 0 and 1.

(Refer Slide Time: 4:02)

SV Stores — Ahmed 18

Item	Category	Qty	Price	Cost
Tomatoes	Vegetables/Food	1	40	40
Curd	Dairy/Food	1	32	32
Cupcakes	Packed/Food	2	25	50
Carrots	Vegetables/Food	1.5	50	75
Beans	Vegetables/Food	1	45	45
Onions	Vegetables/Food	0.5	98	49
Turmeric	Packed/Food	1	82	82
Ghee	Packed/Food	1	230	230
				603

Handwritten (IIT Madras Online Degree):

Srivatsan = $\cancel{0}\cancel{1}2$
Sudeep = $\cancel{0}1$
Akshaya = $\cancel{0}\cancel{1}2$
Advaith = $\cancel{0}\cancel{1}\cancel{2}3$
Akhil = $\cancel{0}1$
Mohith = $\cancel{0}1$
Rajesh = $\cancel{0}1$
Abhinav = $\cancel{0}\cancel{1}\cancel{2}3$
Aparna = $\cancel{0}1$
Vignesh = $\cancel{0}1$
George = $\cancel{0}1$
Ahmed = $\cancel{0}1$

Ahmed is also new, so initialize to 0 increment to 1.

(Refer Slide Time: 4:10)

Item	Category	Qty	Price	Cost
Carrots	Vegetables/Food	1	50	50
Horlicks	Packed/Food	1	270	270
Chips	Packed/Food	1	20	20
Kajal	Cosmetics	1	180	180
Milk	Dairy/Food	3	24	72
				592

Neeraja is new, Neeraja initialize to 0 increment to 1.

(Refer Slide Time: 4:21)

Item	Category	Qty	Price	Cost
Tomatoes	Vegetables/Food	2	40	80
Curd	Dairy/Food	2	32	64
Cupcakes	Packed/Food	3	25	75
Carrots	Vegetables/Food	0.5	50	25
Onions	Vegetables/Food	1	98	98
Handwash	Toiletries	1	139	139
Bananas	Fruits/Food	12	8	96
Eggs	Food	1	45	45
				622

Ahmed this is here again, so 2.

(Refer Slide Time: 4:25)

SV Stores — Akshaya 21

Item	Category	Qty	Price	Cost
Curd	Dairy/Food	0.5	32	16
Butter	Dairy/Food	0.2	320	64
Milk	Dairy/Food	2	24	48
				128

Neeraja = $\emptyset$1
Srivatsan = $\emptyset$12
Sudeep = $\emptyset$1
Akshaya = $\emptyset$123
Advaith = $\emptyset$123
Akhil = $\emptyset$1
Mohith = $\emptyset$1
Rajesh = $\emptyset$1
Abhinav = $\emptyset$123
Aparna = $\emptyset$1
Vignesh = $\emptyset$1
George = $\emptyset$1
Ahmed = $\emptyset$12

Akshaya is there again, so 3.

(Refer Slide Time: 4:30)

Sun General — Suresh 22

Item	Category	Qty	Price	Cost
Batteries	Utilities	2	14	28
Tomatoes	Vegetables/Food	1.5	80	120
Spinach	Vegetables/Food	1	15	15
Bananas	Fruits/Food	4	5	20
Mosquito coils	Household	1	24	24
Guava	Fruits/Food	0.4	120	48
Potato	Vegetables/Food	1.5	40	60
				315

Sudeep = $\emptyset$1
Akshaya = $\emptyset$123
Advaith = $\emptyset$123
Akhil = $\emptyset$1
Mohith = $\emptyset$1
Rajesh = $\emptyset$1
Abhinav = $\emptyset$123
Aparna = $\emptyset$1
Vignesh = $\emptyset$1
George = $\emptyset$1
Ahmed = $\emptyset$12
Suresh = $\emptyset$1

Suresh is new, so Suresh is initialized to 0 and incremented to 1.

SV Stores			Julia	23
Item	Category	Qty	Price	Cost
Carrots	Vegetables/Food	1.5	50	75
Bananas	Fruits/Food	12	8	96
Curd	Dairy/Food	3	32	96
Milk	Dairy/Food	4	24	96
Cereal	Packed/Food	2	220	440
Maggi	Packed/Food	1	85	85
				888

Sudeep = 0 1
Akshaya = 0 1 2 3
Advaith = 0 1 2 3
Akhil = 0 1
Mohith = 0 1
Rajesh = 0 1
Abhinav = 0 1 2 3
Aparna = 0 1
Vignesh = 0 1
George = 0 1
Ahmed = 0 1 2
Suresh = 0 1
Julia = 0 1

Julia is also new, so 0 and 1.

SV Stores			Neeraja	24
Item	Category	Qty	Price	Cost
Milk	Dairy/Food	3	24	72
Chips	Packed/Food	1	20	20
				92

Neeraja = 0 1 2
Srivatsan = 0 1 2
Sudeep = 0 1
Akshaya = 0 1 2 3
Advaith = 0 1 2 3
Akhil = 0 1
Mohith = 0 1
Rajesh = 0 1
Abhinav = 0 1 2 3
Aparna = 0 1
Vignesh = 0 1
George = 0 1

Neeraja was there already, Neeraja is here, so neeraj is now on 2.

(Refer Slide Time: 4:57)

Sun General			Ahmed	25
Item	Category	Qty	Price	Cost
Earphones	Electronics	1	210	210
Phone cover	Accessories	1	140	140
Dongle	Electronics	1	790	790
A4 sheets	Stationery	200	1	200
Ball Pens	Stationery	2	12	24
				1364

Akshaya = $\cancel{0}\cancel{1}\cancel{2}3$
Advaith = $\cancel{0}\cancel{1}\cancel{2}3$
Akhil = $\cancel{0}1$
Mohith = $\cancel{0}1$
Rajesh = $\cancel{0}1$
Abhinav = $\cancel{0}\cancel{1}\cancel{2}3$
Aparna = $\cancel{0}1$
Vignesh = $\cancel{0}1$
George = $\cancel{0}1$
Ahmed = $\cancel{0}\cancel{1}\cancel{2}3$
Suresh = $\cancel{0}1$
Julia = $\cancel{0}1$

Ahmed was also there, so Ahmed is now on 3.

(Refer Slide Time: 5:04)

Sun General			Srivatsan	27
Item	Category	Qty	Price	Cost
Broom	Household	1	70	70
Dustpan	Household	1	45	45
Floor Cleaner	Household	1	125	125
Tissue Paper	Household	2	50	100
				340

Neeraja = $\cancel{0}\cancel{1}2$
Srivatsan = $\cancel{0}\cancel{1}\cancel{2}\cancel{3}4$
Sudeep = $\cancel{0}1$
Akshaya = $\cancel{0}\cancel{1}\cancel{2}3$
Advaith = $\cancel{0}\cancel{1}\cancel{2}3$
Akhil = $\cancel{0}1$
Mohith = $\cancel{0}1$
Rajesh = $\cancel{0}1$
Abhinav = $\cancel{0}\cancel{1}\cancel{2}3$
Aparna = $\cancel{0}1$
Vignesh = $\cancel{0}1$
George = $\cancel{0}1$
Ahmed = $\cancel{0}\cancel{1}\cancel{2}3$

Srivatsan is also now on 3, Srivatsan is now on 4.

(Refer Slide Time: 5:13)

<table>
<tr><td colspan="5">SV Stores   Vignesh   28</td></tr>
<tr><td>Item</td><td>Category</td><td>Qty</td><td>Price</td><td>Cost</td></tr>
<tr><td>Face Wash</td><td>Toiletries</td><td>1</td><td>89</td><td>89</td></tr>
<tr><td>Shampoo</td><td>Toiletries</td><td>1</td><td>140</td><td>140</td></tr>
<tr><td>Maggi</td><td>Packed/Food</td><td>1</td><td>85</td><td>85</td></tr>
<tr><td>Chips</td><td>Packed/Food</td><td>1</td><td>20</td><td>20</td></tr>
<tr><td>Chocolates</td><td>Packed/Food</td><td>4</td><td>10</td><td>40</td></tr>
<tr><td>Air Freshener</td><td>Toiletries</td><td>2</td><td>70</td><td>140</td></tr>
<tr><td></td><td></td><td></td><td></td><td>514</td></tr>
</table>

Sudeep = $\emptyset$1
Akshaya = $\emptyset$123
Advaith = $\emptyset$123
Akhil = $\emptyset$1
Mohith = $\emptyset$1
Rajesh = $\emptyset$1
Abhinav = $\emptyset$123
Aparna = $\emptyset$1
Vignesh = $\emptyset$12
George = $\emptyset$1
Ahmed = $\emptyset$123
Suresh = $\emptyset$1
Julia = $\emptyset$1

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Vignesh, saw Vignesh before so 2.

(Refer Slide Time: 5:21)

<table>
<tr><td colspan="5">SV Stores   Ahmed   29</td></tr>
<tr><td>Item</td><td>Category</td><td>Qty</td><td>Price</td><td>Cost</td></tr>
<tr><td>Chocolates</td><td>Packed/Food</td><td>1</td><td>10</td><td>10</td></tr>
<tr><td>Curd</td><td>Dairy/Food</td><td>2</td><td>32</td><td>64</td></tr>
<tr><td>Bananas</td><td>Fruits/Food</td><td>4</td><td>8</td><td>32</td></tr>
<tr><td></td><td></td><td></td><td></td><td>106</td></tr>
</table>

Sudeep = $\emptyset$1
Akshaya = $\emptyset$123
Advaith = $\emptyset$123
Akhil = $\emptyset$1
Mohith = $\emptyset$1
Rajesh = $\emptyset$1
Abhinav = $\emptyset$123
Aparna = $\emptyset$1
Vignesh = $\emptyset$12
George = $\emptyset$1
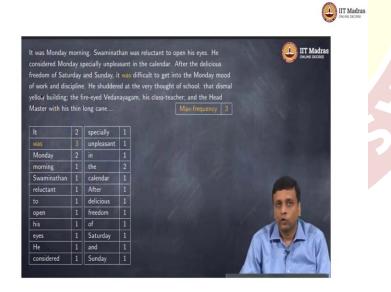Ahmed = $\emptyset$1234
Suresh = $\emptyset$1
Julia = $\emptyset$1

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Ahmed is on 4.

Radha is new I think, so Radha is on 0 goes to 1. This is the last card in our dataset. Now, in order to get the maximum number of shopping bills for a customer what we need to do is go through these variables, the customer variables and find out the maximum. But that would involve two iterations.

Instead if you look at what the professor had done in the lecture, he declared a variable called max frequency which he kept at 0 which we initialized to 0 and each time the frequency of any

variable is greater than max frequency, max frequency was also updated to that new frequency, so it is 1 now and these are all 1's.
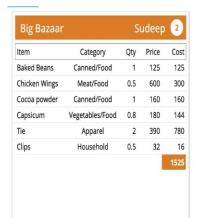
And now was becomes 2, so the max frequency is also updated to 2. And again was becomes 3 so max frequency is now updated to 3. So, in this way, in one iteration itself by keeping an extra variable called max frequency we get the max frequency at the end of a single iteration. Let us do the same thing with our shopping bill dataset.
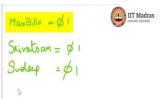
(Refer Slide Time: 7:04)

So, we have one variable which is max bills which is initialized to 0 and from there on we go through every card I am doing the same procedure as before. So, we start with Srivatsan, Srivatsan is initialized to 0 and because there is one card now, Srivatsan is incremented to 1. And now max bills 0 is less than 1, so max bills needs to be updated, we go from 0 to 1.
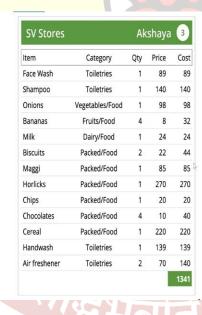
(Refer Slide Time: 7:43)

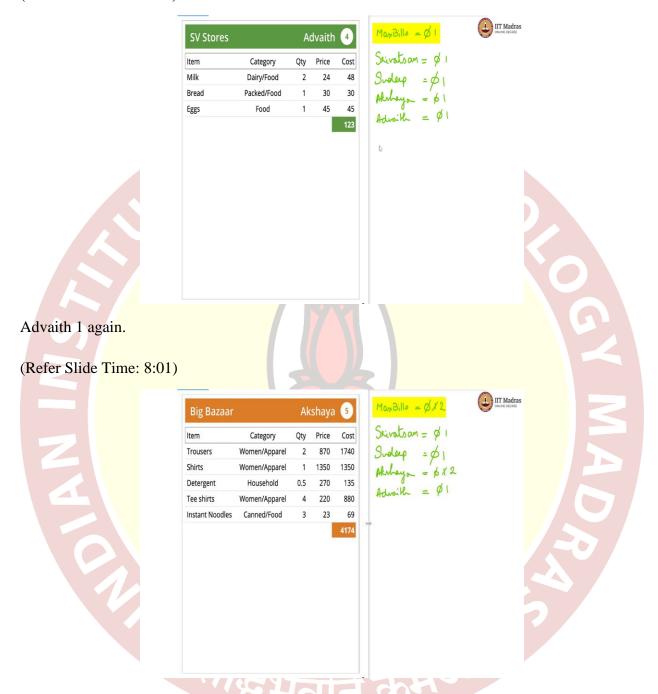Then we have Sudeep, who also gives us 1 no improvement in max bills.

(Refer Slide Time: 7:49)

Akshaya 1 again.

(Refer Slide Time: 7:55)

SV Stores			Advaith	4
Item	Category	Qty	Price	Cost
Milk	Dairy/Food	2	24	48
Bread	Packed/Food	1	30	30
Eggs	Food	1	45	45
				123

MaxBills = ∅1

Srivatsan = ∅1
Sudeep = ∅1
Akshaya = ∅1
Advaith = ∅1

Advaith 1 again.

(Refer Slide Time: 8:01)

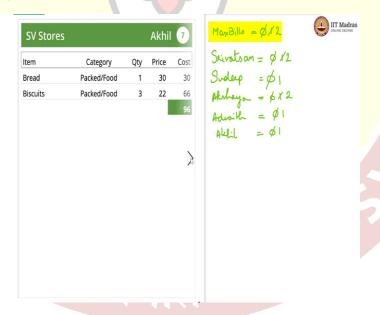| Big Bazaar			Akshaya	5
Item	Category	Qty	Price	Cost
Trousers	Women/Apparel	2	870	1740
Shirts	Women/Apparel	1	1350	1350
Detergent	Household	0.5	270	135
Tee shirts	Women/Apparel	4	220	880
Instant Noodles	Canned/Food	3	23	69
				4174

MaxBills = ∅X2

Srivatsan = ∅1
Sudeep = ∅1
Akshaya = ∅X2
Advaith = ∅1

And now there is one more Akshaya, so akshaya becomes 2, 2 is greater than our max bills value, so max bills needs to be updated to 2.

Then one more Srivatsan, Srivatsan is now on 2, max bills is the same as 2 therefore we do not need to update.

Akhil is new, so it is 1.

(Refer Slide Time: 8:29)

Advaith is now on 2, max bills is also 2, so no updating.

(Refer Slide Time: 8:34)

Mohit is new.

(Refer Slide Time: 8:43)

Sun General			Rajesh	10
Item	Category	Qty	Price	Cost
Notebooks	Stationery	3	20	60
Apples	Fruits/Food	6	24	144
Pears	Fruits/Food	4	30	120
Chart Paper	Stationery	2	22	44
Ruler	Stationery	1	10	10
				378

MaxBills = $\emptyset \times 2$

Srivatsan = $\emptyset \times 2$
Sudeep = $\emptyset 1$
Akshaya = $\emptyset \times 2$
Advaith = $\emptyset \times 2$
Akhil = $\emptyset 1$
Mohith = $\emptyset 1$
Rajesh = $\emptyset 1$

Rajesh is also new.

(Refer Slide Time: 8:49)

SV Stores			Abhinav	11
Item	Category	Qty	Price	Cost
Chocolates	Packed/Food	1	10	10
Cereal	Packed/Food	1	220	220
Bananas	Fruits/Food	6	8	48
Tomatoes	Vegetables/Food	1	40	40
Curd	Dairy/Food	1	32	32
Milk	Dairy/Food	2	24	48
Horlicks	Packed/Food	1	270	270
Plates	Household	4	45	180
Eggs	Food	1	45	45
				893

MaxBills = $\emptyset \times 2$

Srivatsan = $\emptyset \times 2$
Sudeep = $\emptyset 1$
Akshaya = $\emptyset \times 2$
Advaith = $\emptyset \times 2$
Akhil = $\emptyset 1$
Mohith = $\emptyset 1$
Rajesh = $\emptyset 1$
Abhinav = $\emptyset 1$

Abhinav is new.

(Refer Slide Time: 8:57)

Aparna is new.

(Refer Slide Time: 9:04)

Abhinav is now on 2 max bills, two is the same as 2, therefore no updating.

(Refer Slide Time: 9:09)

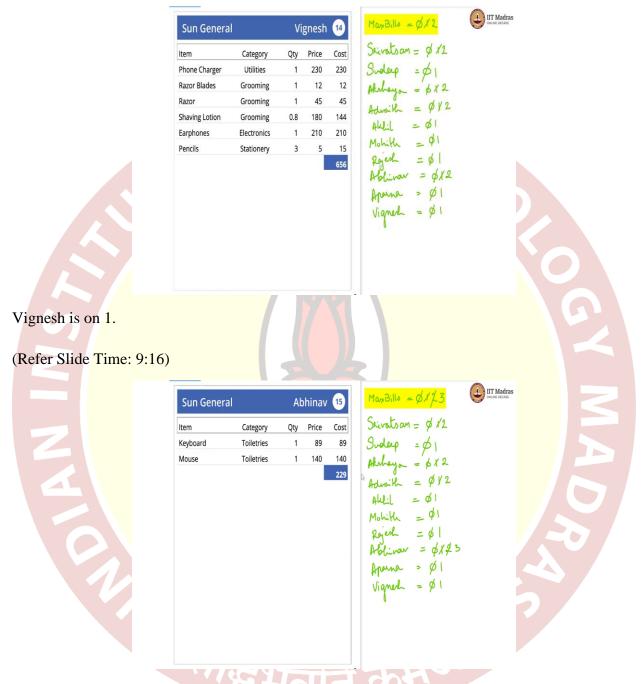Vignesh is on 1.

(Refer Slide Time: 9:16)

One more Abhinav, so Abhinav is now on 3, 3 is greater than or max bills value 2, therefore max bills is updated to 3.

(Refer Slide Time: 9:26)

Advaith is also on 3.

(Refer Slide Time: 9:31)

George is new so 1.

(Refer Slide Time: 9:38)

Ahmed is new so 1 again.

(Refer Slide Time: 9:45)

Neeraja is also new, 1 again.

Ahmed one more 2. Max is 3 so we do not update.

Akshaya is also on 3, max is the same as 3, so we do not update.

(Refer Slide Time: 10:05)

Sun General			Suresh	22
Item	Category	Qty	Price	Cost
Batteries	Utilities	2	14	28
Tomatoes	Vegetables/Food	1.5	80	120
Spinach	Vegetables/Food	1	15	15
Bananas	Fruits/Food	4	5	20
Mosquito coils	Household	1	24	24
Guava	Fruits/Food	0.4	120	48
Potato	Vegetables/Food	1.5	40	60
				315

MaxBills = ⌀XY3

Srivatsan = ⌀ X2
Sudeep = ⌀1
Akshaya = ⌀XY3
Advaith = ⌀YY3
Akhil = ⌀1
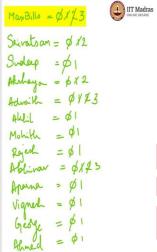Mohith = ⌀1
Rajesh = ⌀1
Abhinav = ⌀XY3
Aparna = ⌀1
Vignesh = ⌀1
George = ⌀1
Ahmed = ⌀Y2
Neeraja = ⌀1
Suresh = ⌀1

Suresh is new, so only 1.

(Refer Slide Time: 10:11)

SV Stores			Julia	23
Item	Category	Qty	Price	Cost
Carrots	Vegetables/Food	1.5	50	75
Bananas	Fruits/Food	12	8	96
Curd	Dairy/Food	3	32	96
Milk	Dairy/Food	4	24	96
Cereal	Packed/Food	2	220	440
Maggi	Packed/Food	1	85	85
				888

Srivatsan = ⌀ X2
Sudeep = ⌀1
Akshaya = ⌀XY3
Advaith = ⌀YY3
Akhil = ⌀1
Mohith = ⌀1
Rajesh = ⌀1
Abhinav = ⌀XY3
Aparna = ⌀1
Vignesh = ⌀1
George = ⌀1
Ahmed = ⌀Y2
Neeraja = ⌀1
Suresh = ⌀1
Julia = ⌀1

Julia is new, so only 1.

(Refer Slide Time: 10:21)

SV Stores			Neeraja	24
Item	Category	Qty	Price	Cost
Milk	Dairy/Food	3	24	72
Chips	Packed/Food	1	20	20
				92

Handwritten notes:
Srivatsan = Ø X2
Sudeep = Ø1
Akshaya = Ø X X 3
Adwaith = Ø Y Z 3
Akhil = Ø1
Mohith = Ø1
Rajesh = Ø1
Abhinav = Ø X Z 3
Aparna = Ø1
Vignesh = Ø1
George = Ø1
Ahmed = Ø Y2
Neeraja = Ø X2
Suresh = Ø1
Julia = Ø1

Neeraja one more 2.

(Refer Slide Time: 10:25)

Sun General			Ahmed	25
Item	Category	Qty	Price	Cost
Earphones	Electronics	1	210	210
Phone cover	Accessories	1	140	140
Dongle	Electronics	1	790	790
A4 sheets	Stationery	200	1	200
Ball Pens	Stationery	2	12	24
				1364

Handwritten notes:
Srivatsan = Ø X2
Sudeep = Ø1
Akshaya = Ø X X 3
Adwaith = Ø Y Z 3
Akhil = Ø1
Mohith = Ø1
Rajesh = Ø1
Abhinav = Ø X Z 3
Aparna = Ø1
Vignesh = Ø1
George = Ø1
Ahmed = Ø Y Z 3
Neeraja = Ø X2
Suresh = Ø1
Julia = Ø1

Ahmed is on 3.

(Refer Slide Time: 10:30)

Srivatsan is also on 3, max bills is still 3, so there is no updating happening.

(Refer Slide Time: 10:39)

Now, Srivatsan goes to 4, max bills is less than 4 therefore update to 4.

(Refer Slide Time: 10:46)

Item	Category	Qty	Price	Cost
Face Wash	Toiletries	1	89	89
Shampoo	Toiletries	1	140	140
Maggi	Packed/Food	1	85	85
Chips	Packed/Food	1	20	20
Chocolates	Packed/Food	4	10	40
Air Freshener	Toiletries	2	70	140

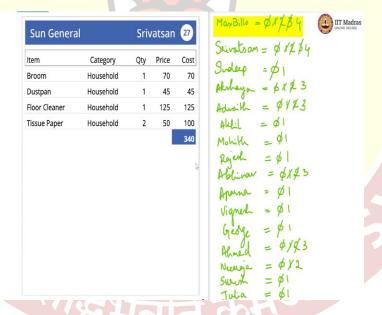SV Stores — Vignesh (28) — Total: 514

MaxBills = 0̸ 1̸ 2̸ 3̸ 4

Srivatsan = 0̸ 1̸ 2̸ 3̸ 4
Sudeep = 0̸ 1
Akshaya = 0̸ 1̸ 2̸ 3
Advaith = 0̸ 1̸ 2̸ 3
Akhil = 0̸ 1
Mohith = 0̸ 1
Rajesh = 0̸ 1
Abhinav = 0̸ 1̸ 2̸ 3
Aparna = 0̸ 1
Vignesh = 0̸ 1̸ 2
George = 0̸ 1
Ahmed = 0̸ 1̸ 2̸ 3
Neeraja = 0̸ 1̸ 2
Suresh = 0̸ 1
Julia = 0̸ 1

Vignesh is on 2.

(Refer Slide Time: 10:50)

Item	Category	Qty	Price	Cost
Chocolates	Packed/Food	1	10	10
Curd	Dairy/Food	2	32	64
Bananas	Fruits/Food	4	8	32

SV Stores — Ahmed (29) — Total: 106

MaxBills = 0̸ 1̸ 2̸ 3̸ 4

Srivatsan = 0̸ 1̸ 2̸ 3̸ 4
Sudeep = 0̸ 1
Akshaya = 0̸ 1̸ 2̸ 3
Advaith = 0̸ 1̸ 2̸ 3
Akhil = 0̸ 1
Mohith = 0̸ 1
Rajesh = 0̸ 1
Abhinav = 0̸ 1̸ 2̸ 3
Aparna = 0̸ 1
Vignesh = 0̸ 1̸ 2
George = 0̸ 1
Ahmed = 0̸ 1̸ 2̸ 3̸ 4
Neeraja = 0̸ 1̸ 2
Suresh = 0̸ 1
Julia = 0̸ 1

Ahmed also goes to 4, however max bills is already 4, so no need to update.

(Refer Slide Time: 10:58)

Big Bazaar			Radha	30
Item	Category	Qty	Price	Cost
Broccoli	Vegetables/Food	0.5	120	60
Chicken Legs	Meat/Food	0.5	320	160
Basa Fish	Meat/Food	1	350	350
Lettuce	Vegetables/Food	0.8	150	120
Eggs	Meat/Food	12	9	108
				798

Radha is new, so 1 and this is our last bill. Therefore, max bills is 4 and we got this in one iteration, we know that the maximum number of bills a customer has in this dataset is 4.