

January

20

Dynamic Itemset Counting.

- We 01 * Itemsets are added dynamically / deleted as we are read
- Th 02
- Fr 03 * Downward closure \rightarrow freq \Rightarrow all subsets freq.
- Sa 04
- Su 05 * stops @ every n xns to add itemsets
- Mo 06

- Tu 07 Train analogy \rightarrow stations @ every n xns : passengers are itemsets;
- We 08 itemsets can get on @ any stop = get off at the same stop in next scan.
- Th 09
- Fr 10
- Sa 11

- Su 12 * Begin count 1 item; first station start 2 items
- Mo 13 . . .

- Tu 14 Solid box \rightarrow conf. freq \rightarrow finished chg $\geq ms$
- We 15 " Circle \rightarrow " in " \rightarrow " " $< ms$
- Th 16 Dashed box \rightarrow susp. freq - still counting; $\geq ms$
- Fr 17 " Circle \rightarrow " freq - " " " $< ms$
- Sa 18

$$Su 19 M=2 \quad ms=25\% \quad / = 2$$

	A	B	C
1	1	1	0
2	1	0	0
3	0	1	1
4	0	0	0

Tu 21 (i) empty itemset = \square

We 22

Th 23 (ii) Mark C as \square ,
Fr 24 others unmarked

Su 25 Mo 27

(iii) Read n xns ; inc chg of those counted;

$$Tu 28 \quad \square \geq ms \rightarrow \boxed{1}$$

We 29

Th 30 Any super set of this has all subsets $\square / \boxed{1}$

Fr 31 Get them to \square

(iv) once damped itemset stored in our ns, convert back

01

W
E
D

January

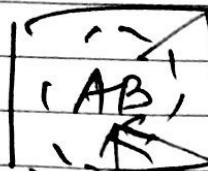
A	B	C
1	1	0
1	0	0
0	1	1

2020

1st Week • 001-365

(i)

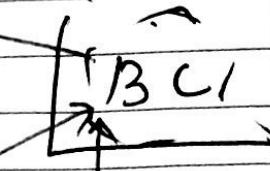
08.00



09.00



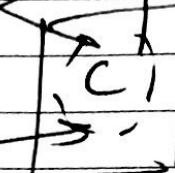
10.00



11.00



12



$$A = 1 + 1$$

$$B = 1$$

A(2)	B(1)	C=0
------	------	-----

(ii)

13.00

2

m

y

are

read;

A(2),

B(1)

>1

>1

13.00

14.00

15.00

Convert A to $\underline{1}$ and AB to $\underline{1}$
 B " " $\underline{1}$ above.

(iv) next 2 m [2m]

17.00

18.00

19.00

20.00

21.00

22.00

23.00

24.00

25.00

26.00

27.00

28.00

29.00

30.00

31.00

Eve.

(iv) next 2; [3m] (2M scan of 1,2).

PRIORITY

$$A=2, B=2, C=1$$

NOTES

$$AB=1, AC=0, BC=0$$

JAN
2020

W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	F	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

2020

1st Week • 002-364

January

25/1/4
TCST
H
U
02

Convert AB to solid Borvia dated 1/1/2020

(iv) Next 2nd screen of (3,4) Xmas, 09.00

BC=1 \Rightarrow Convert to \square AC= \therefore To \circ

ABC is not Counter of

Hash Appointments:

$$h(x,y) = [\text{order}(x) * 10 + \text{order}(y)] \% 7$$

Bounced Address	0	1	2	3	4	5	6	7
ctr	1	1+1	1+1+1	1+1	1+1+1+1+1	1+1+1+1+1	1+1+1+1	4
itemset	1,4	1,5	2,3	2,4	2,5	1,2	1,3	
	3,5	1,5	2,3	2,4	2,5	1,2	1,3	
			2,3			1,2	1,3	
			2,3			1,2	1,3	

Collide w/
↓

PRIORITY

APPOINTMENTS

NOTES

Rehashing Algorithm Chart

03

F
R
I

January

2020

1st Week • 01.01.2020 - 07.01.2020

08.00

 $\checkmark \quad \checkmark \quad \checkmark \quad \checkmark \quad \checkmark$

09.00

 $\checkmark \quad \checkmark \quad \checkmark$

10.00

$$h(x,y) = [o(x) * 10 + o(y)] / 1.7$$

$$\therefore h(1,2) = 1 * 10 + 2 / 1.7 = \boxed{5} \text{ BA}$$

$$h(3,5) = 20 + 5 / 1.7 = 4$$

$$h(1,5) = 15 / 1.7 = 1$$

$$h(2,4) = 24 / 1.7 = \boxed{3}$$

$$h(3,3) = 23 / 1.7 = \boxed{2}$$

$$h(1,2) = 5 \dots h(1,y) = 14 / 1.7 = \boxed{8}$$

$$h(3) = 13 / 1.7 = \boxed{6}$$

18.00

Eve.

 $c = \{a_1 \dots a_{100} (1), p_1 \dots p_{50} (2)\}$

example

 $N = \text{PRIORITY } \{a_1 \dots a_{100} (1)\}$

NOTES

 $\text{No } \{a_1 \dots a_{50}\} : \text{urgent} \rightarrow \text{frequent}$
JAN
2020

	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

2020

1st Week • 004-362

January

S
A
T

04

08.00

Refreshing illustration:-

09.00

1, 2, 3, 4 / 2, 4 / 1, 5 / 1, 2, 3 / 1, 4 / 2, 3 / 1, 3 / 2, 4 / 1, 2 / 1, 3.

10.00

 $h(k) = o(k) \bmod n \rightarrow$ first level (c1). $h(k) = [o(x) * 10 + o(y)] \% n$.

11.00

 $n = 2m + 1$ $\hookrightarrow \# \text{ of items}$

12

"look for materials".

13.00

closed and maximal freq. itemset - Han Defn.

14.00

2 sets; $\{ \langle a_1, \dots, a_{100} \rangle, \langle a_1, \dots, a_{10} \rangle \}$.

15.00

(MS = 1).

16.00

05 Sunday

x is closed \Rightarrow No immediate superset Y with same SC as X

17.00

x is minimal if no immediate super set Y
x is frequent.

18.00

19.00

Even

PRIORITY

APPOINTMENTS

NOTES

S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	•	•

FEB 2020



January

CPI, NFI, LFI

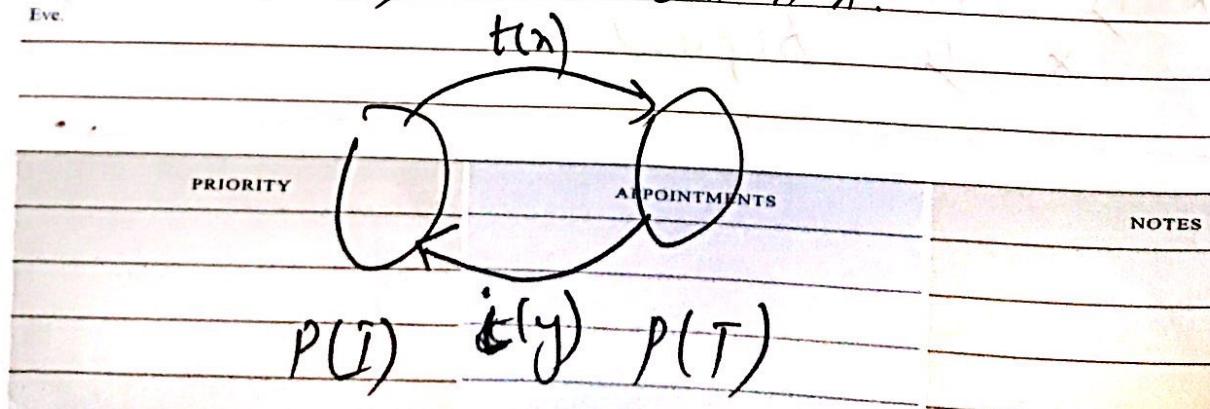
- ① CPI \rightarrow x is CPI if no immediate superset of x
is of same support as x .
- ② NFI \rightarrow x is NFI if no $\dots \dots \dots$
is frequent.

① CPI \rightarrow freq set as large as it can get
w/o losing any xy .

② NFI \rightarrow freq-set not contained in another
frequent itemset.

$t(x)$, $i(y)$ in $xn y$.
 $x \subset I$ $t \subset T$ $y \subset T$

transactions that contain x .



JAN 2020	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

2020

2nd Week • 007-359

January

T
U
F
01

1 2 3 4 5

ACTW, CDW, ACTW, ACDW, ACDTW, CDT 08.00
 $\varnothing = 3$ ex. data set

$$\textcircled{1} \quad t(c) = \{1, 2, 3, 4, 5, 6\}$$

$$\xrightarrow{\text{f}(c)} i(t(c)) = \{c\}. \quad \therefore [c \text{ is closed}]$$

$$\textcircled{2} \quad t(c, d) = \{2, 4, 5, 6\}.$$

$$i(t(c, d)) = \{c, d\}.$$

$$\textcircled{3} \quad t(A) = \{1, 3, 4, 5\}.$$

$$i(t(A)) = \{ACW\} \neq A. \quad \textcircled{1}$$

closure operators:- (i) $i(t(x)) = x$.

(ii) subset increases slightly

$$i(t(HA)) = ACW \quad [1, 3, 4, 5].$$

Closure of $x = y$

in gen if y ; minimal generator

S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

FEB 2020

OB
W
E
D

January

2020

2nd Week • 008-358

08.00

ACD | BCE | ABCE | BE | ABCE

09.00

✓ ✓ ✓ X ✓ $\theta = 3$

10.00

A(3), B(4), C(4), D(1), E(4)

11.00

AB(2), AC(3), AE(2), BC(3), BE(4), CE(1)
 X X X ✓ X X

12.00

: L₂ = BC, CE.

14.00

n D(a)
 A 135

15.00

B 2 3 4 5

16.00

C 1 2 3 5

17.00

E 2 3 4 5

18.00

BC 2 3 5

Eve.

BE 2 3 5

t(i(n))

AC ✓

BE ✓

C ✓

BE ✓ X

BCF

BCF

X

PRIORITY

APPOINTMENTS

NOTES

On Hold

JAN
2020

W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

2020

2nd Week • 009-357

January

T
H
U
09

08.00

09.00

10.00

11.00

12

13.00

14.00

15.00

16.00

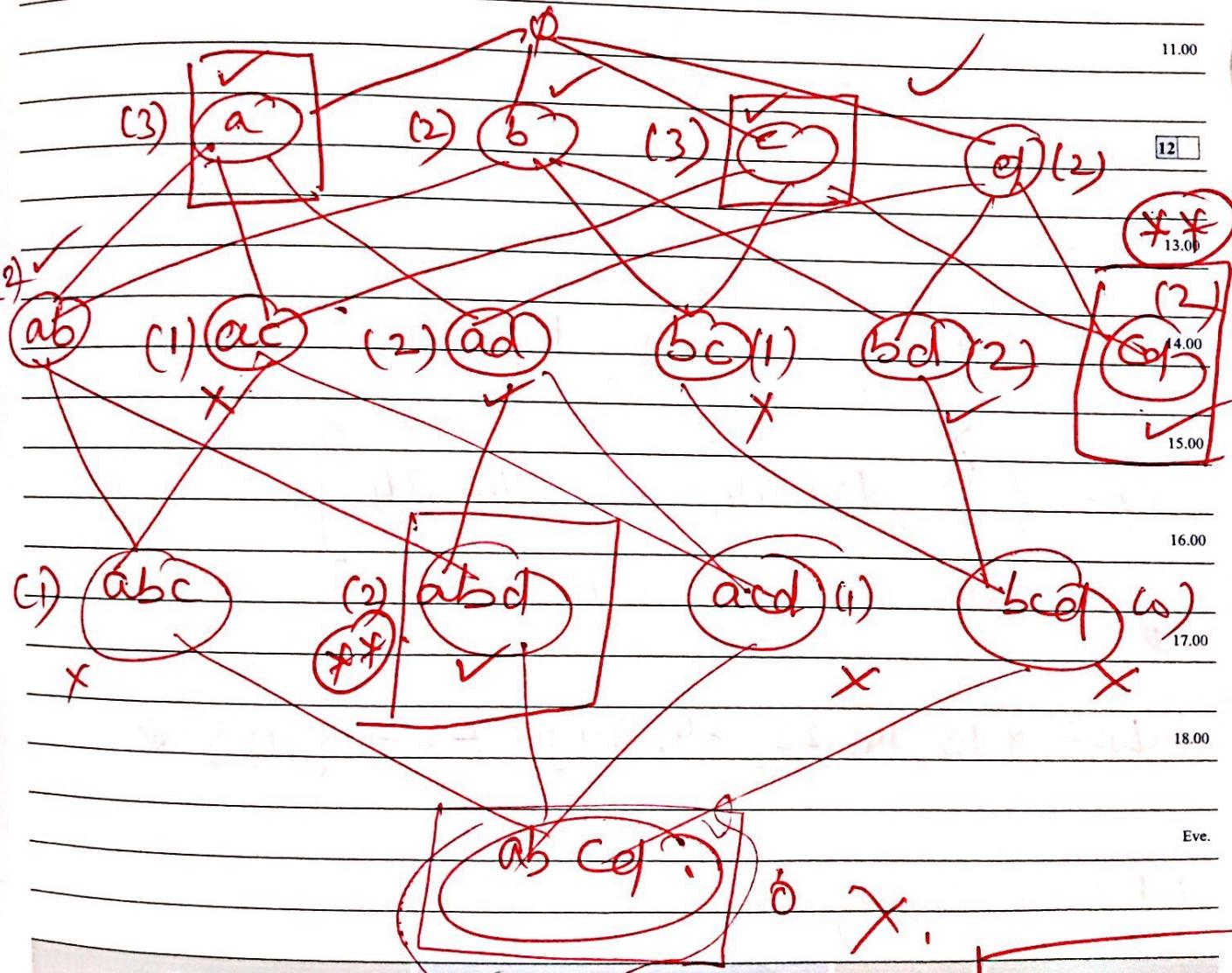
17.00

18.00

Eve.

$\therefore \text{closed} = AC, BE, C, BCE$

"MFI - CF1 - F1 enantisk latte"



PRIORITY

APPOINTMENTS

NOTES

$v = \text{frequent itemsets } (>= 2)$

$\square = \text{cfi}$; $Mf = \circ \times \times$

$\checkmark 2 Mf$
 $\checkmark 4 cf$
 $\checkmark 9 f$

S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	•	•	FEB 2020

2020

2nd Week • 010-356

10

F
R
I
January

08.00

1 2 3 4

(MS-2)

09.00

1 3

2 3

10.00

1 3

11.00

2 3 4

12.

1 4

13.00

$$L_1 = \{1(4), 2(3), 3(5), 4(3)\}, MFS = \{1234\}$$

15.00

X

16.00

$$C_2 = \{12, 13, 14, 23, 24, 34\}$$

(1) (1) (2) (0) (2) (2)

17.00

$$L_2 = \{13, 14, 23, 24, 34\} S_2 = \{12\}$$

Eve.

$$HFS = \{234, 12\cancel{3}\}$$

PRIORITY

APPOINTMENTS

NOTES

NFS

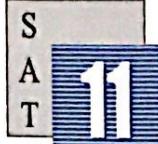
JAN
2020

	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	

2020

2nd Week • 011-355

January



08.00

$$C_3 = \{134, 234\} . \quad L_3 = \{234\} .$$

X

✓

(2)

09.00

$$S_3 = 134$$

$$m \text{ chg}; \therefore NF_3 = \{123, 234\}$$

Y

11.00

$$P = ((3)(2))$$

12

13.00

$$(134) + (123) = 267 + 357 = 624$$

14.00

entertainment is being organized at a

15.00

activities & eos

16.00

12 Sunday

go to house and to go around in

17.00

at a (1234) &

18.00

go from island at 267 & 357

Eve.

and plan at a location

PRIORITY	APPOINTMENTS	NOTES

S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	FEB	2020					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	•	•

FEB

MAR

APR

MAY

JUN

13
M
O
N

January Closed Theory

2020

3rd Week • 013-3

08.00 Closure operators \rightarrow

09.00 * subset remains same $\Rightarrow [i(t(n)) = n]$

10.00 * " slightly increases; but not after that

11.00 $\Rightarrow [i(t(n)) = y \text{ and } n \in y] \text{ and}$
 12. $i(t(y)) = y$

13.00

14.00 $f(n) = i(t(n)) + g(n) = t(i(n))$

* two functions called as closure operators

15.00

CO:- 3 properties

16.00

(i) Idempotence \rightarrow same result on twice appn
 of operator
 $\Rightarrow [f(f(n)) = f(n)]$

(ii) Extremum \rightarrow orig ip subset must be contained in resulting subset
 $\Rightarrow [n \subseteq f(n)]$

PRIORITY	APPOINTMENTS	NOTES
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(iii) Monotony \rightarrow If one ip contained in another ip \Rightarrow first result is in ip

JAN 2020	W	T	F	S	M	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

2020

3rd Week • 014-352

Second resulting subset;

January

TUE
14

08.00

 $\text{if } x \subseteq y \text{ then } f(x) \subseteq f(y)$

09.00

3 properties \rightarrow closed set, generator, minimal generator1) And x be closed $\rightarrow [f(x)=x]$

11.00

 \Rightarrow closure of x is itself.

12

But if $x \subset f(x) \Rightarrow$ a gain element on calling $f(x)$

13.00

 \Rightarrow Also $x \subseteq f(x)$ is always true;

14.00

* A set x is generator of y if closure of $x = y$.

15.00

✓ A and Acw are generators.

17.00

A	gen	Acw
Acw	"	itself

18.00

Eve.

* Minimal gen.:

 \Rightarrow closure of $(x) = y$.

APPOINTMENTS

NOTES

 \Rightarrow No proper subset of a generates y .

S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

FEB

2020

2020

3rd Week • 015-351

15

W
E
D
January

MPI example.

08.00 1: $C1 = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$.09.00 $MFS = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$. $m = 3$ 10.00 $MFS = \emptyset$ 11.00 Part 1: $1(2); 2(6), 3(6), 4(4); 5(8); 6(5)$ 12. $7(7); 8(4); 9(2)$ 13.00 $L1$ and $S1 = \{9, 13, 9\}$.for 1 $MFS = \{2 \rightarrow 9\}$ 15.00 9 $\rightarrow \{2, 3, 4, 5, 6, 7, 8\}$.16.00 ~~because~~ $C2 = \{23, 24, 25, \dots\}$ 17.00 $S2 = \{25, 26, 27, 28, 34, 36, 38, 45, 46, 47, 48, 58, 68, 78\}$.

18.00

for $\{25\}$, in $S2$ $1 \rightarrow 0/k_4$ $MFS = \{345678\} \{234678\}$.for 26 $\rightarrow \{34578\}, \{34678\}, \{23478\}$.JAN
2020

W	F	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

2020

3rd Week • 016-350

2348, 3478.

January

T	H	U
16		

08.00

∴ NFcs updated = {345678, 23478}.

(27) :- {345678, 2346, 3478}.

09.00

10.00

∴ NFcs = {345678, 2348}.

11.00

(28) :- {345678, 234, 348}

12

= {345678, 234}.

13.00

(34) :- {45678, 3578, 24, 23}.

14.00

(36) :- {45678, 5678, 3578, 24, 23}.

15.00

= {45678, 3578, 24, 23}.

16.00

(38) :- {45678, 576, 357, 24, 23}.

Eve.

{45678, 357, 24, 23}

PRIORITY

APPOINTMENTS

NOTES

(45) :- {5678, 4678, 357, 24, 23}.

S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

FEB

2020

2020

3rd Week • 01



January

08.00 (46) $\rightarrow \{ 357, 5678, 678, 478, 23, 24 \}$

09.00

$\{ 357, 5678, 478, 23, 24 \}$.

10.00

(47) $\rightarrow \{ 357, 5678, 78, 48, 23, 24 \}$

11.00

$= \{ 357, 5678, 48, 23, 24 \}$.

12.00

(48) $\rightarrow \{ 357, 5678, 8, 4, 23, 24 \}$.

13.00

(58) In S₂ $\rightarrow \{ 357, 567, 678, 23, 24 \}$.

14.00

(68) $\rightarrow \{ 357, 567, 67, 78, 23, 24 \}$.

15.00

(357, 567, 78, 23, 24)

(78) $\rightarrow \{ 357, 567, 8, 23, 24 \}$.

16.00

CJ = PRIORITY $\{ 234, 357, 567 \}$. APPPOINTMENTS NOTES

$\xrightarrow{\checkmark} \{ 357, 567 \}$.

JAN
2020

	W	T	F	S	S	M		W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	F	S	S	M	T	W	T		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Completed