NAME – ANSH GOEL

REGISTER NO.: 20BCE1798

COURSE NAME: FOUNDATIONS OF DATA ANALYTICS

COURSE CODE: CSE3505

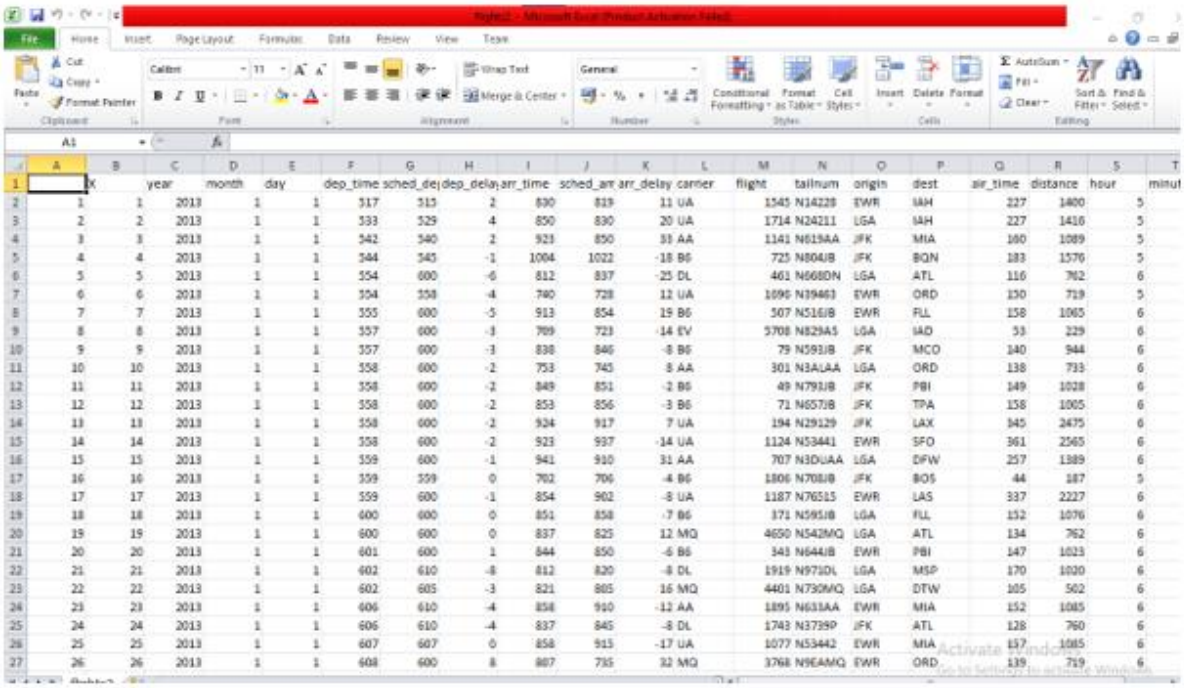
DATE: 8TH September, 2022

LAB-5

Q1) Read and write data for Structured, semi-structured and unstructed file formats.

```
> flight<-read.csv("flights.csv")
> flight
      X year month day dep_time sched_dep_time dep_delay arr_time sched_arr_time arr_delay carrier flight tailnum origin
1     1 2013     1   1      517            515         2      830            819        11      UA   1545  N14228    EWR
2     2 2013     1   1      533            529         4      850            830        20      UA   1714  N24211    LGA
3     3 2013     1   1      542            540         2      923            850        33      AA   1141  N619AA    JFK
4     4 2013     1   1      544            545        -1     1004           1022       -18      B6    725  N804JB    JFK
5     5 2013     1   1      554            600        -6      812            837       -25      DL    461  N668DN    LGA
6     6 2013     1   1      554            558        -4      740            728        12      UA   1696  N39463    EWR
7     7 2013     1   1      555            600        -5      913            854        19      B6    507  N516JB    EWR
8     8 2013     1   1      557            600        -3      709            723       -14      EV   5708  N829AS    LGA
9     9 2013     1   1      557            600        -3      838            846        -8      B6     79  N593JB    JFK
10 10 2013     1   1      558            600        -2      753            745         8      AA    301  N3ALAA    LGA
11 11 2013     1   1      558            600        -2      849            851        -2      B6     49  N793JB    JFK
12 12 2013     1   1      558            600        -2      853            856        -3      B6     71  N657JB    JFK
13 13 2013     1   1      558            600        -2      924            917         7      UA    194  N29129    JFK
14 14 2013     1   1      558            600        -2      923            937       -14      UA   1124  N53441    EWR
15 15 2013     1   1      559            600        -1      941            910        31      AA    707  N3DUAA    LGA
16 16 2013     1   1      559            559         0      702            706        -4      B6   1806  N708JB    JFK
17 17 2013     1   1      559            600        -1      854            902        -8      UA   1187  N76515    EWR
18 18 2013     1   1      600            600         0      851            858        -7      B6    371  N595JB    LGA
19 19 2013     1   1      600            600         0      837            825        12      MQ   4650  N542MQ    LGA
20 20 2013     1   1      601            600         1      844            850        -6      B6    343  N644JB    EWR
21 21 2013     1   1      602            610        -8      812            820        -8      DL   1919  N971DL    LGA
22 22 2013     1   1      602            605        -3      821            805        16      MQ   4401  N730MQ    LGA
23 23 2013     1   1      606            610        -4      858            910       -12      AA   1895  N633AA    EWR
24 24 2013     1   1      606            610        -4      837            845        -8      DL   1743  N3739P    JFK
25 25 2013     1   1      607            607         0      858            915       -17      UA   1077  N53442    EWR
26 26 2013     1   1      608            600         8      807            735        32      MQ   3768  N9EAMQ    EWR
27 27 2013     1   1      611            600        11      945            931        14      UA    303  N532UA    JFK
28 28 2013     1   1      613            610         3      925            921         4      B6    135  N635JB    JFK
29 29 2013     1   1      615            615         0     1039           1100       -21      B6    709  N794JB    JFK
30 30 2013     1   1      615            615         0      833            842        -9      DL    575  N326NB    EWR
31 31 2013     1   1      622            630        -8     1017           1014         3      US    245  N807AW    EWR
32 32 2013     1   1      623            610        13      920            915         5      AA   1837  N3EMAA    LGA
33 33 2013     1   1      623            627        -4      933            932         1      UA    496  N459UA    LGA
34 34 2013     1   1      624            630        -6      909            840        29      EV   4626  N11107    EWR
35 35 2013     1   1      624            630        -6      840            830        10      MQ   4599  N518MQ    LGA
36 36 2013     1   1      627            630        -3     1018           1018         0      US     27  N535UW    JFK
```

```
> write.csv(flight,"flights2.csv")
>
```



	X	year	month	day	dep_time	sched_dep	dep_delay	arr_time	sched_arr	arr_delay	carrier	flight	tailnum	origin	dest	air_time	distance	hour	minut
1	1	2013	1	1	517	515	2	830	819	11	UA	1545	N14228	EWR	IAH	227	1400	5	
2	2	2013	1	1	533	529	4	850	830	20	UA	1714	N24211	LGA	IAH	227	1416	5	
3	3	2013	1	1	542	540	2	923	850	33	AA	1141	N619AA	JFK	MIA	160	1089	5	
4	4	2013	1	1	544	545	-1	1004	1022	-18	B6	725	N804JB	JFK	BQN	183	1576	5	
5	5	2013	1	1	554	600	-6	812	837	-25	DL	461	N668DN	LGA	ATL	116	762	6	
6	6	2013	1	1	554	558	-4	740	728	12	UA	1696	N39463	EWR	ORD	150	719	5	
7	7	2013	1	1	555	600	-5	913	854	19	B6	507	N516JB	EWR	FLL	158	1065	6	
8	8	2013	1	1	557	600	-3	709	723	-14	EV	5708	N829AS	LGA	IAD	53	229	6	
9	9	2013	1	1	557	600	-3	838	846	-8	B6	79	N593JB	JFK	MCO	140	944	6	
10	10	2013	1	1	558	600	-2	753	745	8	AA	301	N3ALAA	LGA	ORD	138	733	6	
11	11	2013	1	1	558	600	-2	849	851	-2	B6	49	N793JB	JFK	PBI	149	1028	6	
12	12	2013	1	1	558	600	-2	853	856	-3	B6	71	N657JB	JFK	TPA	158	1005	6	
13	13	2013	1	1	558	600	-2	924	917	7	UA	194	N29129	JFK	LAX	345	2475	6	
14	14	2013	1	1	558	600	-2	923	937	-14	UA	1124	N53441	EWR	SFO	361	2565	6	
15	15	2013	1	1	559	600	-1	941	910	31	AA	707	N3DUAA	LGA	DFW	257	1389	6	
16	16	2013	1	1	559	559	0	702	706	-4	B6	1806	N708JB	JFK	BOS	44	187	5	
17	17	2013	1	1	559	600	-1	854	902	-8	UA	1187	N76515	EWR	LAS	337	2227	6	
18	18	2013	1	1	600	600	0	851	858	-7	B6	371	N595JB	LGA	FLL	152	1076	6	
19	19	2013	1	1	600	600	0	837	825	12	MQ	4650	N542MQ	LGA	ATL	134	762	6	
20	20	2013	1	1	601	600	1	844	850	-6	B6	343	N644JB	EWR	PBI	147	1023	6	
21	21	2013	1	1	602	610	-8	812	820	-8	DL	1919	N971DL	LGA	MSP	170	1020	6	
22	22	2013	1	1	602	605	-3	821	805	16	MQ	4401	N730MQ	LGA	DTW	105	502	6	
23	23	2013	1	1	606	610	-4	858	910	-12	AA	1895	N633AA	EWR	MIA	152	1085	6	
24	24	2013	1	1	606	610	-4	837	845	-8	DL	1743	N373SP	JFK	ATL	128	760	6	
25	25	2013	1	1	607	607	0	858	915	-17	UA	1077	N53442	EWR	MIA	157	1085	6	
26	26	2013	1	1	608	600	8	807	735	32	MQ	3768	N9EAMQ	EWR	ORD	139	719	6	

b. Unstructured Data- data in text file

```
> library(readr)
>
> # read_file() to read the whole file
> myData = read_file("hello.txt")
> print(myData)
[1] "Hello this is Ansh Goel"
```

c. Semi- structural data- data in xml file

```
> dataframe <- xmlToDataFrame("records.xml")
> print(dataframe)
  ID      NAME SALARY  STARTDATE                 DEPT
1  1   Jonhnny    215  9/23/2015           Operations
2  2     Allen  723.3   3/5/2019  IT and Infrastructure
3  3     Fench    890 11/15/2014  IT and Infrastructure
4  4  Patricia 901.25  6/21/2017 Finance and Accounting
5  5  Jennifer    780 12/16/2016 HR Resource Management
6  6    George    890  6/22/2018  IT and Infrastructure
7  7     Simon 1045.6  7/30/2013           Operations
8  8      Crow  752.6  4/12/2020 Finance and Accounting
>
```

Q2) Perform 5 different manipulation operations for a dataset of your own choice which are:-

- Select
- Arranging order
- Adding columns
- Mutate
- Summarize

Dataset-

```
> df<-mtcars
> df
```

	mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
Mazda RX4	21.0	6	160.0	110	3.90	2.620	16.46	0	1	4	4
Mazda RX4 Wag	21.0	6	160.0	110	3.90	2.875	17.02	0	1	4	4
Datsun 710	22.8	4	108.0	93	3.85	2.320	18.61	1	1	4	1
Hornet 4 Drive	21.4	6	258.0	110	3.08	3.215	19.44	1	0	3	1
Hornet Sportabout	18.7	8	360.0	175	3.15	3.440	17.02	0	0	3	2
Valiant	18.1	6	225.0	105	2.76	3.460	20.22	1	0	3	1
Duster 360	14.3	8	360.0	245	3.21	3.570	15.84	0	0	3	4
Merc 240D	24.4	4	146.7	62	3.69	3.190	20.00	1	0	4	2
Merc 230	22.8	4	140.8	95	3.92	3.150	22.90	1	0	4	2
Merc 280	19.2	6	167.6	123	3.92	3.440	18.30	1	0	4	4
Merc 280C	17.8	6	167.6	123	3.92	3.440	18.90	1	0	4	4
Merc 450SE	16.4	8	275.8	180	3.07	4.070	17.40	0	0	3	3
Merc 450SL	17.3	8	275.8	180	3.07	3.730	17.60	0	0	3	3
Merc 450SLC	15.2	8	275.8	180	3.07	3.780	18.00	0	0	3	3
Cadillac Fleetwood	10.4	8	472.0	205	2.93	5.250	17.98	0	0	3	4
Lincoln Continental	10.4	8	460.0	215	3.00	5.424	17.82	0	0	3	4
Chrysler Imperial	14.7	8	440.0	230	3.23	5.345	17.42	0	0	3	4
Fiat 128	32.4	4	78.7	66	4.08	2.200	19.47	1	1	4	1
Honda Civic	30.4	4	75.7	52	4.93	1.615	18.52	1	1	4	2
Toyota Corolla	33.9	4	71.1	65	4.22	1.835	19.90	1	1	4	1
Toyota Corona	21.5	4	120.1	97	3.70	2.465	20.01	1	0	3	1
Dodge Challenger	15.5	8	318.0	150	2.76	3.520	16.87	0	0	3	2
AMC Javelin	15.2	8	304.0	150	3.15	3.435	17.30	0	0	3	2
Camaro Z28	13.3	8	350.0	245	3.73	3.840	15.41	0	0	3	4
Pontiac Firebird	19.2	8	400.0	175	3.08	3.845	17.05	0	0	3	2
Fiat X1-9	27.3	4	79.0	66	4.08	1.935	18.90	1	1	4	1
Porsche 914-2	26.0	4	120.3	91	4.43	2.140	16.70	0	1	5	2
Lotus Europa	30.4	4	95.1	113	3.77	1.513	16.90	1	1	5	2
Ford Pantera L	15.8	8	351.0	264	4.22	3.170	14.50	0	1	5	4
Ferrari Dino	19.7	6	145.0	175	3.62	2.770	15.50	0	1	5	6
Maserati Bora	15.0	8	301.0	335	3.54	3.570	14.60	0	1	5	8
Volvo 142E	21.4	4	121.0	109	4.11	2.780	18.60	1	1	4	2

5 operations:

i. Sum of NA values and summary

```
> sum(is.na(df))
[1] 0
> summary(df)
```

mpg	cyl	disp	hp	drat	wt	qsec
Min. :10.40	Min. :4.000	Min. : 71.1	Min. : 52.0	Min. :2.760	Min. :1.513	Min. :14.50
1st Qu.:15.43	1st Qu.:4.000	1st Qu.:120.8	1st Qu.: 96.5	1st Qu.:3.080	1st Qu.:2.581	1st Qu.:16.89
Median :19.20	Median :6.000	Median :196.3	Median :123.0	Median :3.695	Median :3.325	Median :17.71
Mean :20.09	Mean :6.188	Mean :230.7	Mean :146.7	Mean :3.597	Mean :3.217	Mean :17.85
3rd Qu.:22.80	3rd Qu.:8.000	3rd Qu.:326.0	3rd Qu.:180.0	3rd Qu.:3.920	3rd Qu.:3.610	3rd Qu.:18.90
Max. :33.90	Max. :8.000	Max. :472.0	Max. :335.0	Max. :4.930	Max. :5.424	Max. :22.90

vs	am	gear	carb
Min. :0.0000	Min. :0.0000	Min. :3.000	Min. :1.000
1st Qu.:0.0000	1st Qu.:0.0000	1st Qu.:3.000	1st Qu.:2.000
Median :0.0000	Median :0.0000	Median :4.000	Median :2.000
Mean :0.4375	Mean :0.4062	Mean :3.688	Mean :2.812
3rd Qu.:1.0000	3rd Qu.:1.0000	3rd Qu.:4.000	3rd Qu.:4.000
Max. :1.0000	Max. :1.0000	Max. :5.000	Max. :8.000

ii. Filter

```
> filter(df,mpg<25)
                   mpg cyl  disp  hp drat    wt  qsec vs am gear carb
Mazda RX4         21.0   6 160.0 110 3.90 2.620 16.46  0  1    4    4
Mazda RX4 Wag     21.0   6 160.0 110 3.90 2.875 17.02  0  1    4    4
Datsun 710        22.8   4 108.0  93 3.85 2.320 18.61  1  1    4    1
Hornet 4 Drive    21.4   6 258.0 110 3.08 3.215 19.44  1  0    3    1
Hornet Sportabout 18.7   8 360.0 175 3.15 3.440 17.02  0  0    3    2
Valiant           18.1   6 225.0 105 2.76 3.460 20.22  1  0    3    1
Duster 360        14.3   8 360.0 245 3.21 3.570 15.84  0  0    3    4
Merc 240D         24.4   4 146.7  62 3.69 3.190 20.00  1  0    4    2
Merc 230          22.8   4 140.8  95 3.92 3.150 22.90  1  0    4    2
Merc 280          19.2   6 167.6 123 3.92 3.440 18.30  1  0    4    4
Merc 280C         17.8   6 167.6 123 3.92 3.440 18.90  1  0    4    4
Merc 450SE        16.4   8 275.8 180 3.07 4.070 17.40  0  0    3    3
Merc 450SL        17.3   8 275.8 180 3.07 3.730 17.60  0  0    3    3
Merc 450SLC       15.2   8 275.8 180 3.07 3.780 18.00  0  0    3    3
Cadillac Fleetwood  10.4   8 472.0 205 2.93 5.250 17.98  0  0    3    4
Lincoln Continental 10.4   8 460.0 215 3.00 5.424 17.82  0  0    3    4
Chrysler Imperial   14.7   8 440.0 230 3.23 5.345 17.42  0  0    3    4
Toyota Corona     21.5   4 120.1  97 3.70 2.465 20.01  1  0    3    1
Dodge Challenger  15.5   8 318.0 150 2.76 3.520 16.87  0  0    3    2
AMC Javelin       15.2   8 304.0 150 3.15 3.435 17.30  0  0    3    2
Camaro Z28        13.3   8 350.0 245 3.73 3.840 15.41  0  0    3    4
Pontiac Firebird  19.2   8 400.0 175 3.08 3.845 17.05  0  0    3    2
Ford Pantera L    15.8   8 351.0 264 4.22 3.170 14.50  0  1    5    4
Ferrari Dino      19.7   6 145.0 175 3.62 2.770 15.50  0  1    5    6
Maserati Bora     15.0   8 301.0 335 3.54 3.570 14.60  0  1    5    8
Volvo 142E        21.4   4 121.0 109 4.11 2.780 18.60  1  1    4    2
```

iii. sampling

```
> sample_frac(df,0.2)
                 mpg cyl  disp  hp drat    wt  qsec vs am gear carb
Merc 280C       17.8   6 167.6 123 3.92 3.440 18.90  1  0    4    4
Lotus Europa    30.4   4  95.1 113 3.77 1.513 16.90  1  1    5    2
Mazda RX4 Wag   21.0   6 160.0 110 3.90 2.875 17.02  0  1    4    4
Hornet 4 Drive  21.4   6 258.0 110 3.08 3.215 19.44  1  0    3    1
Toyota Corolla  33.9   4  71.1  65 4.22 1.835 19.90  1  1    4    1
Dodge Challenger 15.5   8 318.0 150 2.76 3.520 16.87  0  0    3    2
```

iv. arrange

```
> arrange(df,desc(mpg))
                  mpg cyl  disp  hp drat    wt  qsec vs am gear carb
Toyota Corolla   33.9   4  71.1  65 4.22 1.835 19.90  1  1    4    1
Fiat 128         32.4   4  78.7  66 4.08 2.200 19.47  1  1    4    1
Honda Civic      30.4   4  75.7  52 4.93 1.615 18.52  1  1    4    2
Lotus Europa     30.4   4  95.1 113 3.77 1.513 16.90  1  1    5    2
Fiat X1-9        27.3   4  79.0  66 4.08 1.935 18.90  1  1    4    1
Porsche 914-2    26.0   4 120.3  91 4.43 2.140 16.70  0  1    5    2
Merc 240D        24.4   4 146.7  62 3.69 3.190 20.00  1  0    4    2
Datsun 710       22.8   4 108.0  93 3.85 2.320 18.61  1  1    4    1
Merc 230         22.8   4 140.8  95 3.92 3.150 22.90  1  0    4    2
Toyota Corona    21.5   4 120.1  97 3.70 2.465 20.01  1  0    3    1
Hornet 4 Drive   21.4   6 258.0 110 3.08 3.215 19.44  1  0    3    1
Volvo 142E       21.4   4 121.0 109 4.11 2.780 18.60  1  1    4    2
Mazda RX4        21.0   6 160.0 110 3.90 2.620 16.46  0  1    4    4
Mazda RX4 Wag    21.0   6 160.0 110 3.90 2.875 17.02  0  1    4    4
Ferrari Dino     19.7   6 145.0 175 3.62 2.770 15.50  0  1    5    6
Merc 280         19.2   6 167.6 123 3.92 3.440 18.30  1  0    4    4
Pontiac Firebird 19.2   8 400.0 175 3.08 3.845 17.05  0  0    3    2
Hornet Sportabout 18.7  8 360.0 175 3.15 3.440 17.02  0  0    3    2
Valiant          18.1   6 225.0 105 2.76 3.460 20.22  1  0    3    1
Merc 280C        17.8   6 167.6 123 3.92 3.440 18.90  1  0    4    4
Merc 450SL       17.3   8 275.8 180 3.07 3.730 17.60  0  0    3    3
Merc 450SE       16.4   8 275.8 180 3.07 4.070 17.40  0  0    3    3
Ford Pantera L   15.8   8 351.0 264 4.22 3.170 14.50  0  1    5    4
Dodge Challenger 15.5   8 318.0 150 2.76 3.520 16.87  0  0    3    2
Merc 450SLC      15.2   8 275.8 180 3.07 3.780 18.00  0  0    3    3
AMC Javelin      15.2   8 304.0 150 3.15 3.435 17.30  0  0    3    2
Maserati Bora    15.0   8 301.0 335 3.54 3.570 14.60  0  1    5    8
Chrysler Imperial 14.7  8 440.0 230 3.23 5.345 17.42  0  0    3    4
Duster 360       14.3   8 360.0 245 3.21 3.570 15.84  0  0    3    4
Camaro Z28       13.3   8 350.0 245 3.73 3.840 15.41  0  0    3    4
Cadillac Fleetwood 10.4 8 472.0 205 2.93 5.250 17.98  0  0    3    4
Lincoln Continental 10.4 8 460.0 215 3.00 5.424 17.82  0  0    3    4
```

v. select

```
> select(df,starts_with('d'))
                  disp drat
Mazda RX4        160.0 3.90
Mazda RX4 Wag    160.0 3.90
Datsun 710       108.0 3.85
Hornet 4 Drive   258.0 3.08
Hornet Sportabout 360.0 3.15
Valiant          225.0 2.76
Duster 360       360.0 3.21
Merc 240D        146.7 3.69
Merc 230         140.8 3.92
Merc 280         167.6 3.92
Merc 280C        167.6 3.92
Merc 450SE       275.8 3.07
Merc 450SL       275.8 3.07
Merc 450SLC      275.8 3.07
Cadillac Fleetwood 472.0 2.93
Lincoln Continental 460.0 3.00
Chrysler Imperial 440.0 3.23
Fiat 128          78.7 4.08
Honda Civic       75.7 4.93
Toyota Corolla    71.1 4.22
Toyota Corona    120.1 3.70
Dodge Challenger 318.0 2.76
AMC Javelin      304.0 3.15
Camaro Z28       350.0 3.73
Pontiac Firebird 400.0 3.08
Fiat X1-9         79.0 4.08
Porsche 914-2    120.3 4.43
Lotus Europa      95.1 3.77
Ford Pantera L   351.0 4.22
Ferrari Dino     145.0 3.62
Maserati Bora    301.0 3.54
Volvo 142E       121.0 4.11
```

```
> filter(df,mpg>25,hp>90)
               mpg cyl  disp  hp drat    wt qsec vs am gear carb
Porsche 914-2 26.0   4 120.3  91 4.43 2.140 16.7  0  1    5    2
Lotus Europa  30.4   4  95.1 113 3.77 1.513 16.9  1  1    5    2
> 
```

Q3) Perform the following using R-Studio:-

- Read a file a file extract and store only the datetime in a variable.
- Convert the type of dt to Date() and store it in a variable and print its type.
- Convert the type of dt to POSIXct() and store it in a variable and print its type.
- Convert the type of dt to POSIXlt() and store it in a variable and print its type.
- Extract all the components of any date in POSIXlt type.
- Print the weekday. month and quarter of any date.
- Generate and display 3 consective days from a date.
- Find and print the difference between any two dates.
- **Read a file extract and store only the datetime in a variable dt. Show the datatype of that variable.**

```
> dt<-read.csv("datetime.csv")
> dt
        Date  Time
1 23-02-2011 12:15
2 14-12-1977 15:19
3 01-05-1974 17:00
4 21-05-2006 07:30
5 10-02-2003 22:00
>
> typeof(dt$Date)
[1] "character"
> typeof(dt$Time)
[1] "character"
> 
```

- **Convert the type of dt to date() and store it into a variable and print its type.**

```
> dt$Date=as.Date(dt$Date)
> class(dt$Date)
[1] "Date"
>
```

- **Convert the type of dt to POSIXct() and store it in a variable and print its type.**

```
> dt$Date=as.POSIXct(dt$Date)
> class(dt$Date)
[1] "POSIXct" "POSIXt"
```

- **Convert the type of dt to POSIXlt() and store it in a variable and print its type.**

```
> dt$Date=as.POSIXlt(dt$Date)
> class(dt$Date)
[1] "POSIXlt" "POSIXt"
>
```

- **Extract all the components of any date in POSIXlt(() type.**

- **Print the weekday, month and quarter of any date.**

```
> date<-as.Date("10-02-2003")
> weekdays(date)
[1] "Saturday"
> quarters(date)
[1] "Q1"
> months(date)
[1] "February"
>
```

- **Generate and display 3 consecutive days from a date.**

```
> weekdays(date+1:3)
[1] "Sunday"   "Monday"   "Tuesday"
>
```

- **Find and print the difference between any two dates.**

```
> date2<-as.Date("21-05-2006")
> diff=date2-date
> diff
Time difference of 4107 days
>
```

Q4) A college has conducted technical events for the students. It maintains the name of the participant and the score obtained in different events.

- Create a data frame considering 5 students and 4 events. Each event a maximum score of 10. If a student participates in an event, it entry contains the score value and 0 otherwise.
- View the contents of the data frame
- Find the total score of each participant
- Append a column to include the total score of participants and view the data frame
- Find the maximum score and display the name of the participate who scored it
- Compute the average score of each events and append it as a new row in the data frame
- Store the details in comma separated value (csv) also suppress the row numbers.

```
> event<-data.frame(name=c("Ansh","Akshit","Ayan","Saksham","Panda"),event1=c(2,5,7,3,1),event2=c(5,3,4,6,8),event3=c(0,4,3,0,5),event4=c(8,6,5,7,0),event4
=c(8,6,5,7,0))
> total<-rowSums(event[,2:5])
> total
[1] 15 18 19 16 14
> event$total<-total
> event
     name event1 event2 event3 event4 event4.1 total
1    Ansh      2      5      0      8        8    15
2  Akshit      5      3      4      6        6    18
3    Ayan      7      4      3      5        5    19
4 Saksham      3      6      0      7        7    16
5   Panda      1      8      5      0        0    14
> avg<-total/4
> avg
[1] 3.75 4.50 4.75 4.00 3.50
> event$avg<-avg
> event
     name event1 event2 event3 event4 event4.1 total  avg
1    Ansh      2      5      0      8        8    15 3.75
2  Akshit      5      3      4      6        6    18 4.50
3    Ayan      7      4      3      5        5    19 4.75
4 Saksham      3      6      0      7        7    16 4.00
5   Panda      1      8      5      0        0    14 3.50
> event[which.max(total),1]
[1] "Ayan"
> write.csv(event,"event.csv")
>
```

```
> event<-data.frame(name=c("Ansh","Akshit","Ayan","Saksham"
=c(8,6,5,7,0))
> total<-rowSums(event[,2:5])
> total
[1] 15 18 19 16 14
> event$total<-total
> event
     name event1 event2 event3 event4 event4.1 total
1    Ansh      2      5      0      8        8    15
2  Akshit      5      3      4      6        6    18
3    Ayan      7      4      3      5        5    19
4 Saksham      3      6      0      7        7    16
5   Panda      1      8      5      0        0    14
> avg<-total/4
> avg
[1] 3.75 4.50 4.75 4.00 3.50
> event$avg<-avg
> event
     name event1 event2 event3 event4 event4.1 total  avg
1    Ansh      2      5      0      8        8    15 3.75
2  Akshit      5      3      4      6        6    18 4.50
3    Ayan      7      4      3      5        5    19 4.75
4 Saksham      3      6      0      7        7    16 4.00
5   Panda      1      8      5      0        0    14 3.50
> event[which.max(total),1]
[1] "Ayan"
> write.csv(event,"event.csv")
>
```

	A	B	C	D	E	F	G	H	I
1		name	event1	event2	event3	event4	event4.1	total	avg
2	1	Ansh	2	5	0	8	8	15	3.75
3	2	Akshit	5	3	4	6	6	18	4.5
4	3	Ayan	7	4	3	5	5	19	4.75
5	4	Saksham	3	6	0	7	7	16	4
6	5	Panda	1	8	5	0	0	14	3.5