CSE 101 Homework - 02

Unless otherwise specified, all homework is expected to be completed before your next class session meets. In many cases, your next class will build on the prior day's homework and not having it completed may inhibit your understanding of new class material.

Class Readings

Supplemental readings for today (found in document ***Day02_Readings***) include articles and videos to supplement the class discussion about computers.

Excel Exercises

Copy the **student_homework_02_file.xlsx** file from our Day02 folder. This spreadsheet file consists of two sheets: *CPU* containing Intel microprocessor data and *InternetHosts* containing internet hosts data. Rename the file to replace "student" at the front of the file name with your netid.

1. In the *CPU* sheet, add **formulas** to calculate:
    - the clock speed in MHz (the original speed may be given in KHz or GHz and needs to be converted to MHz)
    - assuming that the price reflects transistor price only, the number of transistors you could buy for one dollar
    - assuming that the price reflects clock speeds only, the number of cycles (in MHz) you could buy for one dollar

    Note that some data was not available and therefore is missing from the sheet. If you want to verify you entered correct formulas, check your results against the results shown in the picture presented in following pages.

    Now, chart the following (to chart, select the range you want to chart, then click Insert => Line):

    - transistor count for years 1971-1989
    - transistor count for an all the years
    - clock speed in MHz for years 1971-1989
    - clock speed in MHz for an all the years
    - the number of transistors a person could buy for one dollar for years 1971-1989 (Excel may not be drawing a line between missing data values - search Google to see how to fix this issue)
    - the number of transistors a person could buy for one dollar for all the years
    - the number of cycles (in MHz) a person could buy for one dollar for all the years

    A snapshot of what your solution should look like is provided after the end of homework description.

    Looking at all the charts you produced, do you see anything in common? What is the estimated functional growth of each of the components and their prices?

2. In the *InternetHosts* sheet, add a column to calculate the number of hosts in millions and then create two charts based on this new column: one that would graph the number of hosts (in millions) from 1981-1996 (inclusive) and one that would graph the number of hosts (in millions) for all the years provided in the worksheet.

   The picture of what your solution should look like is provided after the end of homework description. Remember that all the numbers in Column C need to be a result of a formula and not manually typed.

   Based on the functional growth provided in class work and homework assignments, how would you estimate the functional growth of computing overall?

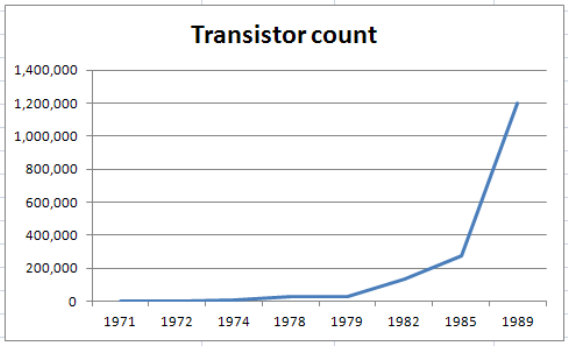
Hand in your properly named solution document (e.g., *<yournetid>_ homework_02_file.xlsx*) into the HW02 assignment in Angel (Lessons tab, Homework folder).

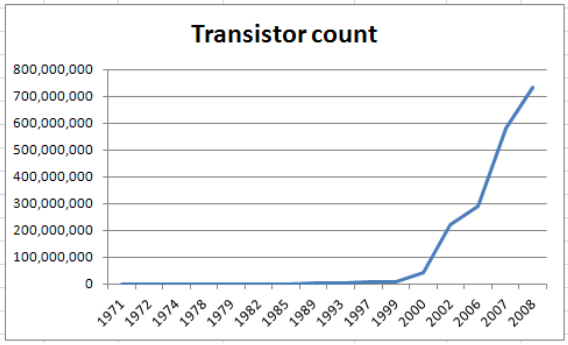
Excel Exercises: Solution Snapshots

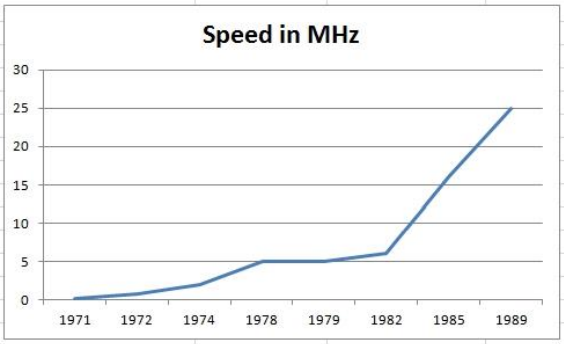
Exercise 1

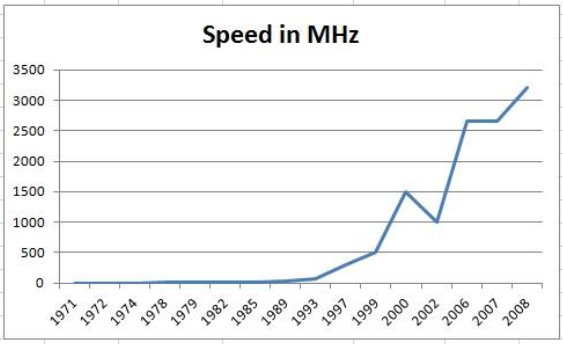
Remember that all the results in columns I, J, K are to be the results of formulas and not manually calculated. (Also remember that we did not ask you to label the horizontal axis data points with the date, so your horizontal axis will probably contain a sequential count for each data point charted as opposed to the "extra" formatting we applied to our charts below)

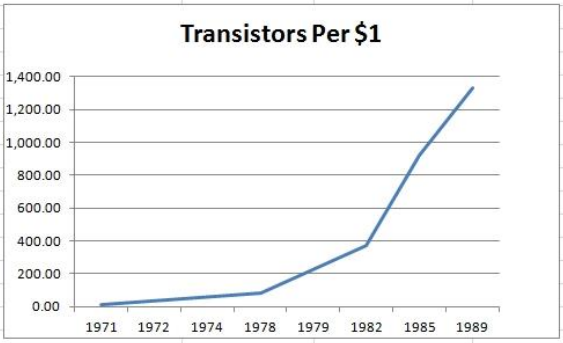
	A	B	C	F	G	H	I	J	K	L	M
1	Intel Microprocessors										
2	From Wikipedia, Intel's site, an http://processortimeline.info/										
3											
4	**Processor**	**Transistor count**	**Date of introduction**	**Clock Speed**	**Unit**	**Price**	**Speed in MHz**	**Transistors Per $1**	**MHz Per $1**		
5	Intel 4004	2,300	1971	108	KHz	$200.00	0.108	11.50	0.00		
6	Intel 8008	3,500	1972	800	KHz		0.8				
7	Intel 8080	4,500	1974	2	MHz		2				
8	Intel 8086	29,000	1978	5	MHz	$360.00	5	80.56	0.01		
9	Intel 8088	29,000	1979	5	MHz		5				
10	Intel 286	134,000	1982	6	MHz	$360.00	6	372.22	0.02		
11	Intel 386	275,000	1985	16	MHz	$299.00	16	919.73	0.05		
12	Intel 486	1,200,000	1989	25	MHz	$900.00	25	1,333.33	0.03		
13	Pentium	3,100,000	1993	66	MHz	$964.00	66	3,215.77	0.07		
14	Pentium II	7,500,000	1997	300	MHz	$1,981.00	300	3,785.97	0.15		
15	Pentium III	9,500,000	1999	500	MHz	$239.00	500	39,748.95	2.09		
16	Pentium 4	42,000,000	2000	1.5	GHz	$819.00	1500	51,282.05	1.83		
17	Itanium 2	220,000,000	2002	1	GHz		1000				
18	Core 2 Duo	291,000,000	2006	2.66	GHz	$530.00	2660	549,056.60	5.02		
19	Quad-Core Intel Xeon	582,000,000	2007	2.66	GHz		2660				
20	Core i7 (Quad)	731,000,000	2008	3.2	GHz	$583.00	3200	1,253,859.35	5.49		

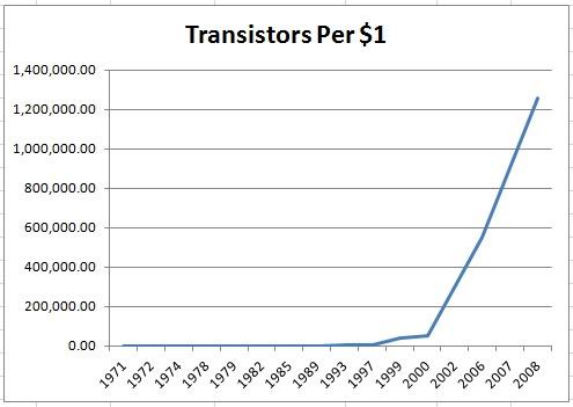


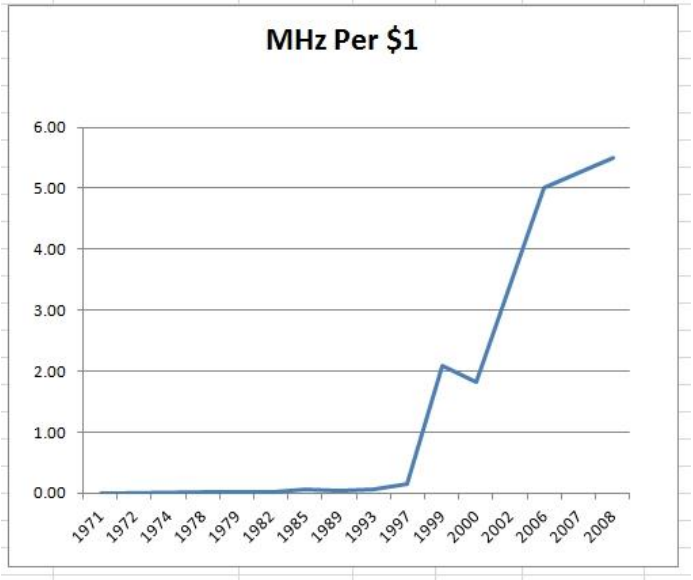



Speed in MHz
30
25
20
15
10
5
0
1971
1972
1974
1978
1979
1982
1985
1989


Speed in MHz
3500
3000
2500
2000
1500
1000
500
0
1971
1972
1974
1978
1979
1982
1985
1989
1993
1997
1999
2000
2002
2006
2007
2008


Transistors Per $1
1,400.00
1,200.00
1,000.00
800.00
600.00
400.00
200.00
0.00
1971
1972
1974
1978
1979
1982
1985
1989


Transistors Per $1
1,400,000.00
1,200,000.00
1,000,000.00
800,000.00
600,000.00
400,000.00
200,000.00
0.00
1971
1972
1974
1978
1979
1982
1985
1989
1993
1997
1999
2000
2002
2006
2007
2008


MHz Per $1
6.00
5.00
4.00
3.00
2.00
1.00
0.00
1971
1972
1974
1978
1979
1982
1985
1989
1993
1997
1999
2000
2002
2006
2007
2008

Exercise 2

Number of Internet hosts (a computer connected to the Internet running one or more Internet server programs)

From https://www.isc.org/solutions/survey/history

Date	Count	Count in Millions
Aug-81	213	0.0002
May-82	235	0.0002
Aug-83	562	0.0006
Oct-84	1,024	0.0010
Oct-85	1,961	0.0020
Feb-86	2,308	0.0023
Nov-86	5,089	0.0051
Dec-87	28,174	0.0282
Jul-88	33,000	0.0330
Oct-88	56,000	0.0560
Jan-89	80,000	0.0800
Jul-89	130,000	0.1300
Oct-89	159,000	0.1590
Oct-90	313,000	0.3130
Jan-91	376,000	0.3760
Jul-91	535,000	0.5350
Oct-91	617,000	0.6170
Jan-92	727,000	0.7270
Apr-92	890,000	0.8900
Jul-92	992,000	0.9920
Oct-92	1,136,000	1.1360
Jan-93	1,313,000	1.3130
Apr-93	1,486,000	1.4860
Jul-93	1,776,000	1.7760
Oct-93	2,056,000	2.0560
Jan-94	2,217,000	2.2170
Jul-94	3,212,000	3.2120
Oct-94	3,864,000	3.8640
Jan-95	4,852,000	4.8520
Jul-95	6,642,000	6.6420
Jan-96	9,472,000	9.4720
Jul-96	12,881,000	12.8810
Jan-97	16,146,000	16.1460
Jul-97	19,540,000	19.5400
Jan-98	29,670,000	29.6700
Jul-98	36,739,000	36.7390