



DELHI PUBLIC SCHOOL

SAIL Township, Ranchi

Pre-Board-II Examination 2019

Class-XII
Time: 3 Hrs.

Subject: Informatics Practices
FM: 70

General Instructions:

- All questions are compulsory.
- Question Paper is divided into 4 sections A, B, C and D.
- **Section A** comprises of questions (1 & 2) comprises 12&18=>**30 marks**
 - o **Question 1** comprises Data Handling-2(DH-2) (Series, Numpy)
 - o **Question 2** comprises of question from Data Handling -2(DH-2)(Data Frames and its operations)
- **Section B** comprises of questions from Basic Software Engineering, comprises **15 marks**.
- **Section C** comprises of questions from Data Management-2(DM-2) comprises **15 marks**.
- **Section D** comprises of questions from Society, Law and Ethics-2(SLE-2) comprises **10 marks**.

SECTION-A		
1.	Answer the following questions:	
(a)	Write the difference between list and NumPy arrays.	1
ANS	1. List occupies more space than numpy arrays. 2. Operations on the list are more time consuming than arrays.	
(b)	Write the use of Re-indexing.	1
ANS	Re-indexing changes the index of data frame. Suppose the data frame df contains column name and rollno. import pandas as pd Df1=pd.DataFrame({ 'rollno':[1,2,3], 'name':['abc','def','ghi']}, index=['a','b','c']) Df1=Df1.reindex(index=['b','c','a']) print (Df1)	
(c)	What is default value of inplace clause when we apply processing on dataframe.	1
ANS	By default inplace is false.	
(d)	Create a 7 X 3 two dimensional array from the range of integers 13..34	1
ANS	b=np.arange(13,34).reshape(7,3)	
(e)	Write the commands using the given NumPy Array named ar1 to split the as asked: Array([[10, 11, 12, 13, 14], [15, 16, 17, 18, 19], [20, 21, 22, 23, 24], [25, 26, 27, 28, 29]]) <i>Write the main code sniped to display as follows after splitting:</i>	2
	(i) [[17 18] [22 23] [27 28]]	(ii) [[16 17 18 19] [21 22 23 24]]
ANS	(i) import numpy as np ar1 = np.array([[10, 11, 12, 13, 14], [15, 16, 17, 18, 19], [20, 21, 22, 23, 24], [25, 26, 27, 28, 29]]) print(ar1[1: , 2:4])	(ii) import numpy as np ar1 = np.array([[10, 11, 12, 13, 14], [15, 16, 17, 18, 19], [20, 21, 22, 23, 24], [25, 26, 27, 28, 29]]) print(ar1[1:3 , 1:])
(f)	Consider the array A = np.array ([10,20,30,40,50,60,70,80,90,100,110,120]).reshape(3,4) What will be the result/output of the following statements: (i) print (A[:2, 1:]) (ii) print (A[1:3,3:1:-1])	2
ANS	(i) [[20 30 40] [60 70 80]]	(ii) [[80 70] [120 110]]
	OR	
	import numpy as np	

	<pre>a = np.arange(10, 1, -2) print("A sequential array with a negative step: \n", a) nwar = a[np.array([3, 1, 2])] print("Elements at these indices are:\n", nwar)</pre>		
ANS	<p>A sequential array with a negative step: [10 8 6 4 2] Elements at these indices are: [4 8 6]</p>		
(g)	<p>Write a code to plot the paths of movement of the two objects in different directions given in this figure named My Pyplot :</p>		2
ANS	<pre>import matplotlib.pyplot as plt plt.plot([2,4,6,8,10,12],[1, 2, 3, 4, 5, 4], 'g') # Creates a line in ref to X-Axis & Y-Axis respectability of Green colour('g') plt.plot([1,2,3,4,5,6],[1, 2, 3, 4, 5, 4], 'b') # Creates a line in ref to X-Axis & Y-Axis respectability of Blue colour('b') plt.grid() # Reformat the layout with grid plt.title('My Pyplot') # Displays title of the layout at the top plt.ylabel('some numbers') # Displays label of Y-Axis plt.xlabel('values') # Displays label of X-Axis plt.show()</pre>		
(h)	Define with an example: (i) Covariance (ii) Linear Regression		
ANS	<p>(i) Covariance is a statistical measure that shows whether two variables are related by measuring how the variables change in relation to each other.</p> <p>(ii) Linear regression is a statistical approach for modelling relationship between a dependent variable with a given set of independent variables.</p>	2	
2.	Answer the following questions:		
(a)	<p>_____ method in Pandas can be used to divide the range of data into equal-sized subgroups or equal probability :</p> <p>(i) pivot() (ii) var() (iii) quantile() (iv) median()</p>	1	
ANS	quantile()		
(b)	<p>Hitesh wants to display the last four rows of the dataframe df and has written the following code : df.tail() But last 5 rows are being displayed. Identify the error and rewrite the correct code so that last 4 rows get displayed.</p>	1	
ANS	df.tail(4)		
(c)	<p>Given the following set of data: Weight measurements for 16 small orders of French Fries (in grams) 78 72 69 81 63 67 65 75 79 74 71 83 71 79 80 69</p> <p>(i) Create a simple histogram from above data. (ii) Create a horizontal histogram from above data.</p>	2	
ANS	<pre>import numpy as np import matplotlib.pyplot as p1 ar=np.array([78,72,69,81,63,67,65,75,79,74,71,83,71,79,80,69]) (i) p1.hist(ar)</pre>		

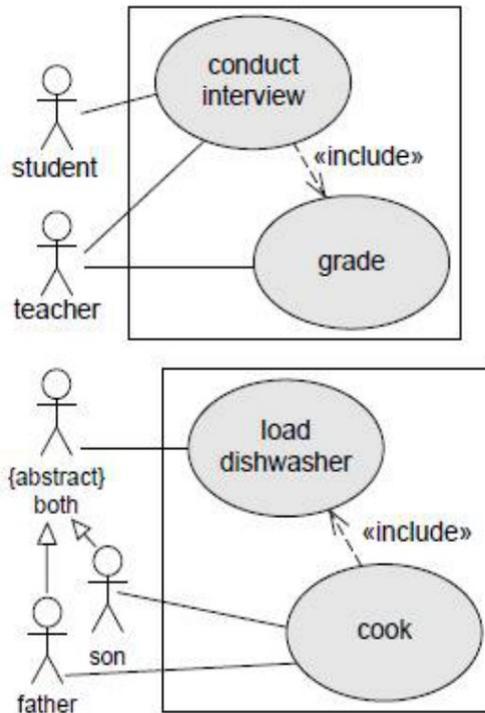
	<p>(ii) p1.hist(ar,orientation='horizontal') <i>(iii) p1.hist(ar,cumulative=True)</i> <i>(iv) p1.boxplot(ar,showbox=False)</i></p>																													
(d)	<p>Write the commands to perform the following operations on two 4X4 dimension arrays namely P & Q: (i) Adding 10 to P (ii) Divide all elements of Q by 7 <i>(iii) Extract all those elements from P which are divisible by 5</i> <i>(iv) Multiplication of two arrays P and Q</i></p>	2																												
ANS	<p>(i) P=P+10 (ii) Q=Q/7 <i>(iii) cond=np.mod(p,5)==0</i> <i>print(np.extract(cond,p))</i> <i>(iv) print(P*Q)</i></p>																													
(e)	<p>Write a python code to create a dataframe with appropriate headings from the list given below : ['S101', 'Amy', 70], ['S102', 'Bandhi', 69], ['S104', 'Cathy', 75], ['S105', 'Gundaho', 82]</p>	2																												
ANS	<pre>import pandas as pd # initialize list of lists data = [['S101', 'Amy', 70], ['S102', 'Bandhi', 69], ['S104', 'Cathy', 75], ['S105', 'Gundaho', 82]] # Create the pandas DataFrame df = pd.DataFrame(data, columns = ['ID', 'Name', 'Marks']) # print dataframe. print(df)</pre>																													
(f)	<p>Suppose a data frame contains information about student having columns rollno, name, class and section. Write the code for the following: (i) Add one more column as fee. (ii) Write python code to delete column fee of data frame. (iii) Write the code to append df2 with df1.</p>	3																												
ANS	<p>(i) Df1["fee"]=[100,200,300] (ii) Df2.pop("fee") (iii) Df2=Df2.append(Df1)</p>																													
(g)	<p>Consider the following dataframe, and answer the questions given below:</p> <pre>import pandas as pd df = pd.DataFrame({ "Quarter1": [2000, 4000, 5000, 4400, 10000], "Quarter2": [5800, 2500, 5400, 3000, 2900], "Quarter3": [20000, 16000, 7000, 3600, 8200], "Quarter4": [1400, 3700, 1700, 2000, 6000] })</pre> <p>(i) Write the code to find mean value from above dataframe df over the index and column axis. (ii) Use sum() function to find the sum of all the values over the index axis. (iii) Find the median of the dataframe df.</p>	3																												
ANS	<p>(i) print(df.mean(axis = 1, skipna = True)) print(df.mean(axis = 0, skipna = True)) (ii) print(df.sum(axis = 1, skipna = True)) (iii) print(df.median())</p>																													
(h)	<p>Assume following data is stored in data frame named as df1 Write commands of the following: (i) Find total sales per state. (ii) Find total sales per employee. (iv) Find mean, median and min sale state wise. (v) Find maximum sale by individual.</p> <p>Name of</p> <table border="1"> <thead> <tr> <th>Employee</th> <th>Sales</th> <th>Quarter</th> <th>State</th> </tr> </thead> <tbody> <tr> <td>RSahay</td> <td>125600</td> <td>1</td> <td>Delhi</td> </tr> <tr> <td>George</td> <td>235600</td> <td>1</td> <td>Tamil Naidu</td> </tr> <tr> <td>JayaPriya</td> <td>213400</td> <td>1</td> <td>Kerala</td> </tr> <tr> <td>ManilaSahai</td> <td>189000</td> <td>1</td> <td>Haryana</td> </tr> <tr> <td>RymaSen</td> <td>456000</td> <td>1</td> <td>West Bengal</td> </tr> <tr> <td>ManilaSahai</td> <td>172000</td> <td>2</td> <td>Haryana</td> </tr> </tbody> </table>	Employee	Sales	Quarter	State	RSahay	125600	1	Delhi	George	235600	1	Tamil Naidu	JayaPriya	213400	1	Kerala	ManilaSahai	189000	1	Haryana	RymaSen	456000	1	West Bengal	ManilaSahai	172000	2	Haryana	4
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ANS	(i) <code>pv1=pd.pivot_table(dfN,index=['State'], values=['Sales'],aggfunc=np.sum)</code> (ii) <code>pv1=pd.pivot_table(dfN,index=['Name of Employee'], values=['Sales'],aggfunc=np.sum)</code> (iii) <code>pv1=pd.pivot_table(dfN,index=['State'],values=['Sales'],aggfunc=[np.mean,np.min,np.max])</code> (iv) <code>pv1=pd.pivot_table(dfN,index=['Name of Employee'],values=['Sales'],aggfunc=np.max)</code>	
SECTION-B		
3.	Answer the following questions:	
(a)	Which is the evolutionary process model? (i) Waterfall (ii) Spiral (iii) Component based model (iv) Delivery model	1
ANS	Spiral	
(b)	_____ is an Agile development methos wich tells how to manage tasks within a team-based development environment. (i) Scrum (ii) Version Control System (iii) GIT (iv) Use Case Diagram	1
ANS	Scrum	
(c)	Write two drawbacks of pair programming.	2
ANS	1. If skills and experiences between two programmers are different, it will reduce productivity. 2. Disagreement between two partners ruins the project.	
(d)	What is difference between water fall model and evolutionary model of software engineering?	2
ANS	1. In Water Fall model all phases are completed one by one in linear fashion and we get software after completing all the stages where as in Evolutionary Model we are adding new as suggested by user feedback to already build in and it is waterfall with iterations. 2. Water Fall model works well for smaller projects and projects where requirements are well understood whereas the Evolutionary model is suitable for large projects which can be decomposed into a set of modules for incremental development and delivery.	
(e)	What do you understand by scrum and sprint?	2
ANS	1. Scrum is agile software development strategy that organizes software developers as a team to reach common goal of creating ready-to-market project. 2. Sprint is time period when software development is actually done and goal of each sprint is to create saleable product.	
(f)	Arvind is leading a team of 6 junior members of software development to complete a client's project on Banking system. Being a leader he is going to prepare a presentation to explain the total life-cycle of the project. Now you suggest Arvind to place major 6 points to explain the 6 members as the sub-leader of each event of the total cycle of the project.	3
ANS	Given below are the various phases of SDLC: <ul style="list-style-type: none"> • Requirement gathering and analysis • Design • Implementation or coding • Testing • Deployment • Maintenance 	

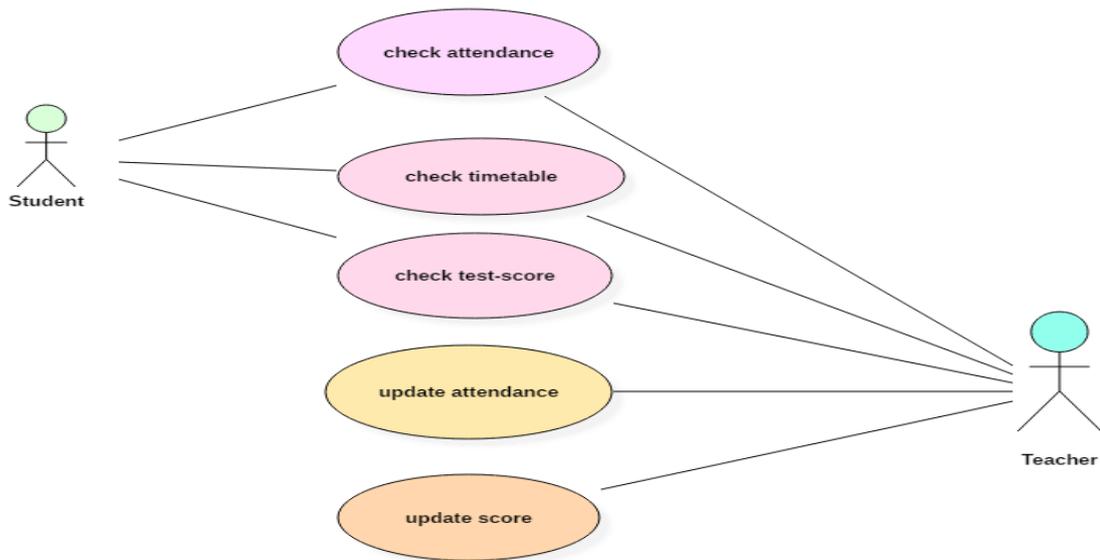
(g)

(i) Look at the following use case diagrams and write the actors and the situation depicted by the use case diagrams:

2+2



(ii) Look at the use case diagram shown below and explain the relationship depicted between Student and Teacher and their area of functions:



ANS

(i) A teacher is conducting an interview with a student. In the course of that, the teacher always has to grade the student. Father and son cook dinner. In the course of that, one of them always has to load the dishwasher.

1. B can execute the same use cases as A.
2. B inherits all of A's associations.

(ii) In this use-case diagram the working of the student management system, there are two actors named Student and a Teacher. There are a total of five use cases that represent the specific functionality of a student management system. Each actor interacts with a particular use case. A student actor can check attendance, timetable as well as test marks on the application or a system. This actor can perform only these interactions with the system even though other use cases are remaining in the system.

SECTION-C

4. Answer the following questions:

(a)	Write the difference between GET & POST request of Django project?	2																																				
ANS	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; padding: 5px;"><u>GET Method</u></th> <th style="text-align: center; padding: 5px;"><u>POST Method</u></th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"> <p>GET is <u>to request data from the server</u>. It is used to search through a database without making any changes.</p> <p>(i) All form data is encoded into the URL appended to the action URL as query string parameters.</p> <p>(ii) Parameters remain in browser history hence cannot be used to send password like sensitive information.</p> <p>(iii) Easier to hack for script kiddies</p> <p>(iv) Can be bookmarked.</p> <p>(v) Can be cached.</p> <p>Example: <i>def search(request):</i> <i>if request.method == 'GET': # this will be GET now</i> <i>book_name = request.GET.get('search')</i></p> </td> <td style="padding: 5px;"> <p>POST is <u>to submit data to be processed to the server</u>. It is used when changing, adding or removing from the database and when handling sensitive information like passwords.</p> <p>i) Form data appears within the message body of the HTTP request.</p> <p>ii) Parameters are not saved in browser history hence can be used to send sensitive information.</p> <p>iii) More Difficult to hack.</p> <p>iv) Cannot be bookmarked.</p> <p>v) Cannot be cached.</p> <p>Example: <i>def search(request):</i> <i>if request.method == 'POST':</i> <i>book_name = request.POST.getlist('search')</i></p> </td> </tr> </tbody> </table>	<u>GET Method</u>	<u>POST Method</u>	<p>GET is <u>to request data from the server</u>. It is used to search through a database without making any changes.</p> <p>(i) All form data is encoded into the URL appended to the action URL as query string parameters.</p> <p>(ii) Parameters remain in browser history hence cannot be used to send password like sensitive information.</p> <p>(iii) Easier to hack for script kiddies</p> <p>(iv) Can be bookmarked.</p> <p>(v) Can be cached.</p> <p>Example: <i>def search(request):</i> <i>if request.method == 'GET': # this will be GET now</i> <i>book_name = request.GET.get('search')</i></p>	<p>POST is <u>to submit data to be processed to the server</u>. It is used when changing, adding or removing from the database and when handling sensitive information like passwords.</p> <p>i) Form data appears within the message body of the HTTP request.</p> <p>ii) Parameters are not saved in browser history hence can be used to send sensitive information.</p> <p>iii) More Difficult to hack.</p> <p>iv) Cannot be bookmarked.</p> <p>v) Cannot be cached.</p> <p>Example: <i>def search(request):</i> <i>if request.method == 'POST':</i> <i>book_name = request.POST.getlist('search')</i></p>																																	
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(b)	Write code to establish a connection to a mysql database from python and to check whether connection has been established with a message "Connection is Successfully made...".	2																																				
ANS	<pre>import mysql.connector as sqlcon con=sqlcon.connect(host="localhost",user="root",passwd="mysql",database="school") if con.is_connected(): print("Connection is Successfully made...")</pre>																																					
(c)	Help your brother to write a set of code in Python to connect and open a database SCHOOL of password as mysql, followed by running next sql command to display the list of existing databases.	2																																				
ANS	<pre>import mysql.connector as sqlcon con= sqlcon.connect(host="localhost", user="root", passwd="mysql") mycursor=con.cursor() mycursor.execute("create database school") mycursor.execute("show databases")</pre>																																					
(d)	<p>Kriti is a new learner of MySQL and basics of Python. Help her to understand the difference between the followings :</p> <p>(i) Cursor and Connector</p> <p>(ii) Candidate key and Alternative key</p> <p>(iii) Group By and Order By</p> <p>(iv) Commit and Rollback</p>	4																																				
ANS	<p>(i) Cursor to execute SQL commands in Python; but Connector connects Python with database.</p> <p>(ii) Those keys are eligible to be Primary key are candidate key; whereas Alternative key is those left out keys apart from Primary key among the candidate keys.</p> <p>(iii) Group by groups the similar values of an attribute; but Order by rearranges the data in ascending or descending order.</p> <p>(iv) SQL command Commit is used to save permanently of the previous all transactions in a database; whereas Rollback is used to undo the previous all transactions in a database.</p>																																					
(e)	<p>On the basis of following table Pharma, answer the given questions:</p> <p style="text-align: center;">Table: Pharma</p> <hr style="border-top: 1px dashed black;"/> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">RxID</th> <th style="padding: 5px;">DrugID</th> <th style="padding: 5px;">DrugName</th> <th style="padding: 5px;">Price</th> <th style="padding: 5px;">PharmacyName</th> <th style="padding: 5px;">PharmacyLocation</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">R1000</td> <td style="padding: 5px;">5476</td> <td style="padding: 5px;">Amlodipine</td> <td style="padding: 5px;">100.00</td> <td style="padding: 5px;">Rx Pharmacy</td> <td style="padding: 5px;">Pitampura</td> </tr> <tr> <td style="padding: 5px;">R1001</td> <td style="padding: 5px;">2345</td> <td style="padding: 5px;">Paracetamol</td> <td style="padding: 5px;">15.00</td> <td style="padding: 5px;">Raj Medicos</td> <td style="padding: 5px;">Bahadurgarh</td> </tr> <tr> <td style="padding: 5px;">R1002</td> <td style="padding: 5px;">1236</td> <td style="padding: 5px;">Nebistar</td> <td style="padding: 5px;">60.00</td> <td style="padding: 5px;">MyChemist</td> <td style="padding: 5px;">Rajouri Garden</td> </tr> <tr> <td style="padding: 5px;">R1003</td> <td style="padding: 5px;">6512</td> <td style="padding: 5px;">VitaPlus</td> <td style="padding: 5px;">150.00</td> <td style="padding: 5px;">MyChemist</td> <td style="padding: 5px;">Gurgaon</td> </tr> <tr> <td style="padding: 5px;">R1004</td> <td style="padding: 5px;">5631</td> <td style="padding: 5px;">Levocitrezine</td> <td style="padding: 5px;">110.00</td> <td style="padding: 5px;">RxPharmacy</td> <td style="padding: 5px;">South Extension</td> </tr> </tbody> </table> <hr style="border-top: 1px dashed black;"/>	RxID	DrugID	DrugName	Price	PharmacyName	PharmacyLocation	R1000	5476	Amlodipine	100.00	Rx Pharmacy	Pitampura	R1001	2345	Paracetamol	15.00	Raj Medicos	Bahadurgarh	R1002	1236	Nebistar	60.00	MyChemist	Rajouri Garden	R1003	6512	VitaPlus	150.00	MyChemist	Gurgaon	R1004	5631	Levocitrezine	110.00	RxPharmacy	South Extension	5
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	Write commands in SQL for (i) to (iv): (i) To increase the price of “Amlodipine” by 50. (ii) To display all those medicines whose price is in the range 100 to 150. (iii) To display the Maximum price offered by pharmacy located in “Gurgaon” (iv) To display the Drug ID, DrugName and Pharmacy Name of all the records in descending order of their price. (v) To display sum of price for each PharmacyName having more than 1 drug.	
ANS		
SECTION-D		
5.	Answer the following questions:	
(a)	Stealing someone’s intellectual work and representing it as your own known as: (i) Phishing (ii) Scam (iii) Plagiarism (iv) Intellectual property	1
ANS	Plagiarism	
(b)	Give brief description about Bitcoin.	1
ANS	Bitcoin is a crypto-currency. It is a decentralized digital currency without a central bank or single administrator that can be sent from user to user on the peer-to-peer bitcoin network without the need for intermediaries.	
(c)	Posing someone else online and using his/her personal/financial information shopping online or posting something is a common these days: (i) Name such cyber-crime. (ii) What measures can be taken to prevent it (any two).	2
ANS	(i) Online fraud (ii) Measures are : <ul style="list-style-type: none"> • Strong security mechanism by the ecommerce site and payment gateways to prevent such frauds. • A monitoring official body to ensure sanctity of e-commerce Company. 	
(d)	Rajnish has to deliver a speech on the Social and Cultural changes induced by Social Media. Now you are asked to guide him to make fundamental 8 points to prepare his speech on the subject.	2
ANS	<ul style="list-style-type: none"> • Identity Theft • Cyber Bullying • Gaming Addiction • Privacy • Health & Fitness • Education • Terrorism & Crime • Communication Breakdown • Defamation of Character 	
(e)	What are intellectual property rights? Why should intellectual property rights be protected?	2
ANS	These are rights of the owner of information to decide how much information can be exchanged, shared or distributed and right to decide the pricing of information for sharing. These rights must be protected- <ul style="list-style-type: none"> • To ensure distribution of new ideas and technology. • To promote investment in national economics. 	
(f)	Write a note on issues of e-waste management.	2
ANS	E-waste is a growing problem for us in India. As an 132cr strong economy, we produce e- waste in large quantities. It is very important to dispose off waste in a pragmatic manner. <ul style="list-style-type: none"> • Give Back to Your Electronic Companies and Drop Off Points • Visit Civic Institutions • Donating Your Outdated Technology • Sell Off Your Outdated Technology • Give Your Electronic Waste to a Certified E-Waste Recycler 	

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