	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF MATHEMATICS			
	EXAMINATION FOR SENIORS STUDENTS OF STATISTICS			
	COURSE TITLE: DATA MINING			COURSE CODE: ST4208
DATE:1/6/2015	JUNE,2015	TERM:SECOND	TOTAL ASSESSMENT MARKS:150	TIME ALLOWED:2HOURS

Answer the following questions

First question

1. Define: Misclassification error – sequential analysis – clustering – association rule.
2. Discuss the steps of the data mining process and the strategies of success.

Second question

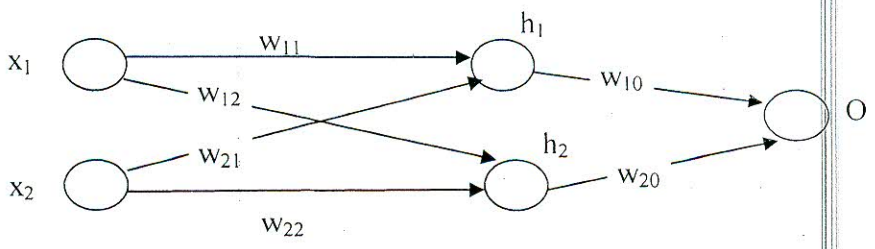
1. Explain linear discriminant analysis for classification when p = 1.
2. Show how we use the k nearest neighbor algorithm for regression.

Third question

1. Deduce the confidence interval for accuracy of a decision tree model.
2. Show the difference between supervised and unsupervised learning.

Fourth question

Given the following neural network consisted of input, hidden, and output layers:



Compute the modified weights if $x_1 = 0$, $x_2 = 1$, $w_{11} = w_{22} = w_{10} = w_{20} = 1$, $w_{12} = w_{21} = 0$, t (target)=1, η (learning rate) = 1

Examiners	Prof. Dr. ENTSAR EL-KHOULY	Dr. NEAMA SALAH YOUSSSEF

With my best wishes

TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF MATHEMATICS

EXAMINATION FOR SENIORS STUDENTS (FOURTH YEAR) STUDENTS OF COMPUTER SCIENCE

COURSE TITLE: TIME SERIES		COURSE CODE: ST4204	
E:23-5-2015	JON,...	TERM:SECOND	TOTAL ASSESSMENT MARKS:100	TIME ALLOWED: 2 HOURS

nswer the following questions(each question of 20 marks):

1- A- Define: 1- Irregular variation 2- Cyclic variation

B- Deduce the parameters estimates $\hat{a}$, $\hat{b}$ for the exponential trend model $y=ae^{bt}$.

2- For the following data calculate the quadratic model and the trend value of 1990 :

t	1980	1981	1982	1983	1984
y	12	10	11	13	9

3- A - Using the method of semi average to obtain the trend values for the following data by taking the average as the mean :

year	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
data	9.74	9.26	8.86	8.25	7.81	8.01	7.55	7.24	7.01	6.88	7.03

B -Consider the following data:

time	1990	1991	1992	1993	1994	1995	1996
sales	2	4	7	1	2	3	5

1-Obtain the forth order moving average. 2- Find the third order moving median.

4- For the following data calculate the seasonal index and the adjusted data:

season	1994	1995	1996
Summer	6.2	6.5	6.4
Winter	8.1	7.9	8.3
Autumn	8	8.2	7.9
Spring	7.2	7.7	7.5

5- Calculate the weighted index number for the following data :

item	1995		2000	
	price	quantity	price	quantity
A	2	20	3	21
B	18	3	36	2
C	3	18	4	23

EXAMINERS	PROF. DR./	DR/ ADEL EDRESS
	DR/	DR/

With my best wishes

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF MATHEMATICS			
	EXAMINATION FOR SENIORS STUDENTS OF STATISTICS			
	COURSE TITLE: DATA MINING			COURSE CODE: ST4208
DATE:1/6/2015	JUNE,2015	TERM:SECOND	TOTAL ASSESSMENT MARKS:150	TIME ALLOWED:2HOURS

Answer the following questions

First question

1. Define: Misclassification error – sequential analysis – clustering – association rule.
2. Discuss the steps of the data mining process and the strategies of success.

Second question

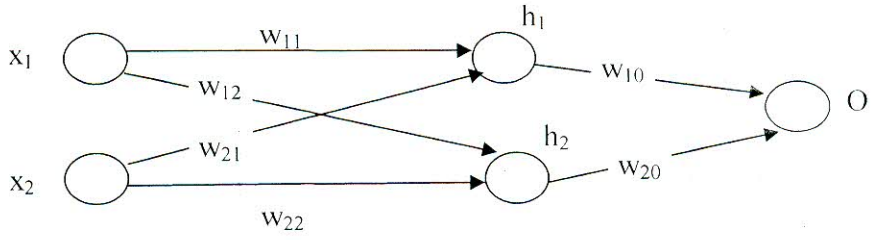
1. Explain linear discriminant analysis for classification when p = 1.
2. Show how we use the k nearest neighbor algorithm for regression.

Third question

1. Deduce the confidence interval for accuracy of a decision tree model.
2. Show the difference between supervised and unsupervised learning.

Fourth question

Given the following neural network consisted of input, hidden, and output layers:



Compute the modified weights if $x_1 = 0$, $x_2 = 1$, $w_{11} = w_{22} = w_{10} = w_{20} = 1$, $w_{12} = w_{21} = 0$, t (target)=1, η (learning rate) = 1

Examiners	Prof. Dr. ENTSAR EL-KHOULY	Dr. NEAMA SALAH YOUSSSEF

With my best wishes

	Tanta University		
	Faculty of Science – Department of Mathematics and Statistics		
	Examination for seniors (4th Level) Students of Statistics and Computer Science		
	Course Title: Queueing Theory		**Corse code: ST4202**
Date: Wednesday 10/6/2015	**Term: Second 2015**	**Total Assessment Marks: 100**	**Time Allowed: 3:00 Hours**

Answer the following questions: *(20 Marks for each question)*

Q1 - Workmen in a factory have to bring their work to a quality control inspector before the work can proceed to the final stage of production. There are six numbers of men and the arrival pattern in approximately random at an average rate of four per hour. The time to inspect a price of work has an exponential distribution with mean twenty minutes.

i) Find the average number of men in the system on the basis of one, two and three inspectors.

ii) What is the probability that the men do not lead the service?

Q2 – Construct a full differential - difference equations for the state – dependent truncated single – channel Markovian queue with reneging, reflecting barrier and catastrophes.

Q3 – Find the point estimation of the parameters for non - truncated single - channel Markovian system adding the concept of balking under steady - stat conditions.

Q4 - Derive the expected values waiting times for:

i) Unlimited single - channel Markovian queue with state-dependent service.

ii) Unlimited Markovian queue with unlimited service.

iii) Transient behavior of single - channel Markovian queue with no one allowed waiting.

Q5 - Using the differential - difference equations for the truncated multi – channel Markovian queue to derive the expected values waiting times. Then show that the probabilities and measures reduce to those given for the non - truncated multi – channel Markovian queue and the truncated single – channel Markovian queue.

With best of luck and success

Dr. K. A. M. Kotb *Dr. Abd Elmonem Anwar*

د. كلب عبدالمنعم انور

جامعة طنطا
كلية العلوم الفرقة : - الرابعة (شعبة أحصاء) دور يونيه ٢٠١٥
قسم الرياضيات المادة :- م. ت. جزئية+دوال خاصة الزمن:- ساعتات
لائحة جديدة MA(٤٢٢٦)

أجب عن خمسة من الأسئلة التالية:-

١) أ)عرف دالة جاما $F(x)$ وعين قيم $\Gamma(6)$ ، $\Gamma(\frac{1}{2})$ ، $\Gamma(\frac{5}{2})$

ب) أحسب قيمة التكامل المثلثي $C_0 = \int_0^{\frac{\pi}{2}} \sin^3 x \cos^5 x dx$

ج) عرف دوال بسل $I_3(x)$ ، $I_2(x)$ بطريقتين مع ذكر الرتبة والنوع لهما.

٢) أ) أحسب التكامل $C = \int x^{15} J_{12}(x) dx$

ب) عين مفكوك لجندر للدالة $F(x) = \begin{cases} 2x, & -1 \le x \le 0 \\ 0, & 0 \prec x \le 1 \end{cases}$ في الفترة $[-1,1]$

٣) أ) أذكر خاصية تعامد ومعيارية ك. ح لجندر $P_n(x)$ مع ذكر أمثله.

ب) أذكر خاصية تعامد ومعيارية ك. ح هبرمت $H_n(x)$ مع ذكر أمثله.

ج) أثبت تقارب الضرب اللا نهائي $I = \prod_{n=1}^{\infty} e^{6/(n+1)(n+2)}$ وعين قيمة.

(4) Solve the partial differential equation

$$Z_{xx} + xZ_{xy} - 6x^2 Z_{yy} = x^{-1} Z_x$$

---

(5) (*a*) Solve the partial differential equation

$$yZ_{xy} = 6Z_x$$

and find a particular solution for ; $Z(0,y) = e^{-y}$, $Z(x,2) = x^2 - 2$

(b) Solve the boundary-value problem

$$u_x = 16u_y \quad u(0,y) = 7e^{3y} + 8e^{5y}.$$

By using Separation of variables

---

(6) (a) Find the general solution of $(y-z)z_x + (x-y)z_y = (z-x)$

(b) Find the integral surface of equation $4yzz_x + z_y + 2y = 0$

which passes the curve $x + z = 2;$ $y^2 + y^2 = 1$

مع أطيب التمنيات بالنجاح أ.د سعيد أحمد أبو العلا

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF MATHEMATICS			
	EXAMINATION FOR SENIORS (FOURTH YEAR) STUDENTS OF STATISTICS			
	COURSE TITLE:	**STATISTICS SOFTWARE**		COURSE CODE: **ST4210**
DATE:	JUNE, 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

أجب عن الأسئلة التالية:

السؤال الاول: (i) لنفرض أن كمبيوتر ينتج أرقاما مختلفة ، ونريد معرفة هل انتاج الكمبيوتر للأرقام الزوجية أو الفردية عشوائيا أم لا فاذا بدأ الكمبيوتر بالعمل فأنتج الارقام التالية:

8	1	5	7	1	3	7	2	9	3	2	9	6	5	6	6	6	7	8	7
5	6	1	1	3	2	3	4	7	4	8	4	3	5	6	4	5	9	8	7

أكتب الخطوات اللازمة للاجابة على: هل انتاج الأرقام الفردية عشوائى أم لا عند $\alpha = 0.05$ ؟ (١٥ درجة)

(ii) (١٥ درجة) أكتب الخطوات اللازمة للحصول على النتائج التالية وماذا تستنتج من هذه النتائج ؟

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Weight	20	90.5000	26.20265	5.85909

One-Sample Test

	Test Value = 100					
	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Weight	-1.621	19	.121	-9.50000	-21.7632	2.7632

****

السؤال الثانى: (٣٠ درجة)

أكمل الجدول التالى ثم أكتب الخطوات اللازمة للحصول على النتائج التالية وماذا تستنتج من هذه النتائج ؟

ANOVA

Arabic

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	30.500	2	.....	.....	.062
Within Groups	.....	9	.....		
Total	66.250	11			

****

السؤال الثالث:

(i) لديك البيانات التالية: 5,3,2,3,2,1,5,5,4,4,2,5

أذكر خطوات الحصول على: مقاييس النزعة المركزية وتكوين الجدول التكرارى ورسم المدرج التكرارى. (١٥ درجة)

(ii) (١٥ درجة) يمثل الجدول التالى عدد الموظفين حسب النوع فى أحد الشركات من عام 2000 الى 2003

2003	2002	2001	2000	السنة النوع
360	300	240	150	الذكور
90	80	50	30	الاناث

ما هى خطوات ادخال هذه البيانات وخطوات تمثيلها بالخطين البيانيين ثم بالاعمدة المتراكمة. (١٥ درجة)

****

السؤال الرابع:

أكتب الخطوات اللازمة للحصول على النتائج التالية وماذا تستنتج من هذه النتائج ؟

(i) (١٥ درجة)

Univariate Analysis of Variance

Between-Subjects Factors

		Value Label	N
level	1.00	first	14
	2.00	second	11
	3.00	third	18
	4.00	fourth	15
gender	1.00	male	29
	2.00	female	29

Tests of Between-Subjects Effects

Dependent Variable: arabic

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1342418.189[a]	7	191774.027	1.302	.269
Intercept	836134.612	1	836134.612	5.677	.021
level	695669.314	3	231889.771	1.574	.207
gender	192599.562	1	192599.562	1.308	.258
level * gender	632386.194	3	210795.398	1.431	.245
Error	7364320.656	50	147286.413		
Total	9448019.000	58			
Corrected Total	8706738.845	57			

a. R Squared = .154 (Adjusted R Squared = .036)

(ii) (١٥ درجة)

Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.935[a]	.874	.862	6.41148

a. Predictors: (Constant), x

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2861.180	1	2861.180	69.603	.000[b]
	Residual	411.070	10	41.107		
	Total	3272.250	11			

a. Dependent Variable: y

b. Predictors: (Constant), x

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	23.783	6.671		3.565	.005
	x	.755	.090	.935	8.343	.000

a. Dependent Variable: y

****

السؤال الخامس: (i) أكتب الخطوات اللازمة للحصول على النتائج التالية وماذا تستنتج من هذه النتائج ؟ (١٥ درجة)

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Arabic	73.8500	20	14.58649	3.26164
	English	66.7000	20	18.39365	4.11294

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Arabic & English	20	.670	.001

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	90% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Arabic - English	7.15000	13.84605	3.09607	1.79648	12.50352	2.309	19	.032

(ii) (١٥ درجة)

تمثل البيانات التالية عدد الأشخاص الذين تناولوا العشاء فى مطعم ما على مدى 50 يوما:

20	12	16	19	24	6	10	1	15	23
8	30	25	7	10	8	16	24	22	8
12	10	5	14	27	20	21	16	18	12
16	23	20	4	17	27	19	16	8	6
9	7	12	14	19	22	20	16	14	15

أكتب الخطوات اللازمة للاجابة على: هل متغير عدد الأشخاص الذين تناولوا العشاء فى المطعم يتبع التوزيع الطبيعى عند $\alpha = 0.05$ ؟

****

EXAMINERS	DR. MEDHAT A. EL-DEMSESY	DR. HAMDY M. ABOU-GABAL

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF MATHEMATICS			
	EXAMINATION FOR SENIORS (FOURTH YEAR) STUDENTS OF STATISTICS			
1969	COURSE TITLE:	MULTIVARIATE STATISTICS		COURSE CODE: ST4206
DATE:	JUNE, 2015	TERM: SECOND	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

Answer the following questions:

1- (a) Let $(X_1, X_2, ..., X_n)$ be an n-variate random variable. Define the joint c.d.f. , the joint conditional p.m.f. $p_{X_1/X_2,...,X_n}(x_1/x_2, ..., x_n)$, covariance matrix Σ, and conditional correlation $\rho_{X_1X_2/X_3=x_3}$. (16 Marks)

(b) Let $(X_1, X_2, ..., X_n)$ be an n-variate normal random variable . Show that if the covariance of X_i *and* X_j is zero for $i \neq j$, that is $\text{cov}(X_i, X_j) = \sigma_{ij} = \begin{cases} \sigma_i^2 & , i = j \\ 0 & , i \neq j \end{cases}$, then $X_1, X_2, ..., X_n$ are independent. (20 Marks)

(c) Given $X_1, X_2, ..., X_n$ with joint p.d.f. $f_{X_1,X_2,...,X_n}(x_1, x_2, ..., x_n)$. Let $Y_k = aX_k + b$ for constants $a > 0$ *and* b. What is the joint p.d.f. $f_{Y_1Y_2,...,Y_n}(y_1, y_2, ..., y_n)$? (14 Marks)

****

2- Consider the following joint p.d.f. $f(x_1, x_2, x_3) = k(x_1 + x_2 + x_3)$, where $0 < x_1, x_2, x_3 < 1$.

a) Determine the constant k. (10 Marks)
b) Compute Σ. (30 Marks)
c) Find the regression equation of X_2 *on* X_1 *and* X_3. (15 Marks)

****

3- a) Consider the scenario in which you toss a fair die 12 times. What is the probability that each face value (1-6) will occur exactly twice? (10 Marks)

(b) Let X_1, X_2, *and* X_3 be independent standard normal random variables. Let $Y_1 = X_1 + X_2 + X_3$, $Y_2 = X_1 - X_2$, $Y_3 = X_2 - X_3$. Determine the joint p.d.f.of Y_1, Y_2, *and* Y_3. (35 Marks)

****

EXAMINERS	DR. ABD EL-MONEIM ANWER	DR. HANAN HAMDY SEEF EL-NASER

TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF MATHEMATICS

EXAMINATION FOR SENIORS STUDENTS (FOURTH YEAR) STUDENTS OF COMPUTER SCIENCE

COURSE TITLE: TIME SERIES			COURSE CODE: ST4204
DATE:23-5-2015	JON,...	TERM:SECOND	TOTAL ASSESSMENT MARKS:100	TIME ALLOWED: 2 HOURS

Answer the following questions(each question of 20 marks):

1- A- Define: 1- Irregular variation 2- Cyclic variation

B- Deduce the parameters estimates $\hat{a}$, $\hat{b}$ for the exponential trend model $y=ae^{bt}$.

2- For the following data calculate the quadratic model and the trend value of 1990 :

t	1980	1981	1982	1983	1984
y	12	10	11	13	9

3- A - Using the method of semi average to obtain the trend values for the following data by taking the average as the mean :

year	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
data	9.74	9.26	8.86	8.25	7.81	8.01	7.55	7.24	7.01	6.88	7.03

B -Consider the following data:

time	1990	1991	1992	1993	1994	1995	1996
sales	2	4	7	1	2	3	5

1-Obtain the forth order moving average. 2- Find the third order moving median.

4- For the following data calculate the seasonal index and the adjusted data:

season	1994	1995	1996
Summer	6.2	6.5	6.4
Winter	8.1	7.9	8.3
Autumn	8	8.2	7.9
Spring	7.2	7.7	7.5

5- Calculate the weighted index number for the following data :

item	1995		2000	
	price	quantity	price	quantity
A	2	20	3	21
B	18	3	36	2
C	3	18	4	23

EXAMINERS	PROF. DR./	DR/ ADEL EDRESS
	DR/	DR/

With my best wishes