Stockholms universitet

OBS! Läs noga igenom anvisningarna i tentamen, t.ex. hur du ska skriva svaren. Det är ditt ansvar som student att följa de anvisningar som ges.

NOTE! Read the examination instructions carefully, e.g. how to write the answers. It is your responsibility as a student to follow the given instructions.

Skriv din anonymiseringskod och dagens datum på allt material du lämnar in.
(*Enter your anonymization code and todays date on all submitted materials*)

Anonymiseringskod (*Anonymization code*)	311-0182-GJG		
Datum (*Date* YYYY-MM-DD)	2022-02-11	Plats nr. (*Seat No.*)	8

Kurs/Kurskod (*Course/Course code*)	STE 101
Kursmoment (*Course component*)	

Fylls i av tentamensvärd (*To be filled in by invigilator*)

Direkt i skrivning: (kryss)		Svarsblankett: (kryss)	X	Lösa svarsblad: (antal)	2
Lämnat in blankt: (kryss)		Dator: (kryss)			

Inlämningstid: 12:59 Signatur tentamensvärd: _____

Fylls i av lärare/examinator (*To be filled in by teacher/examinator*)

Betyg:	B	Poäng:	88

Signatur rättande lärare/examinator: _____

STOCKHOLM UNIVERSITY
Department of Statistics

Fall 2021 C-D

ANSWER FORM Exam – Basic Statistics for Economists
2022-02-11

Room: E 306

Anonymous code: 311-0182-GJG *(write clearly!)*

Mark your answers with a clear cross (X) in the corresponding boxes below.

NOTE! Only one cross per question. If more than one alternative has been marked, zero points will be awarded for that question.

NOTE! If, after checking your calculations properly, you are convinced that the correct answer is not included among the given alternatives, write your answer in the margin to the right and explain you reasoning on the back.

	A	B	C	D	E
1a	X				X
✓ 1b			X		
2a	X				X
✓ 2b			X		
✓ 2c		X			
✓ 3a		X			
✓ 3b			X		
✓ 3c		X			
✓ 4a			X		
✓ 4b				X	
✓ 5a	X				
✓ 5b		X			

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Datum: (Date YYYY-MM-DD)	2022-02-11	Kurs/Kurskod: (Course/Course code)	STE101	Sidnr.: (Page no.)
Anonymiseringskod (Anonymization code)	311-0182-GJG			1

Uppg.nr.: (Task no.) 6

Lärarens kommentar: (Teacher's note)

A

THIS IS AN X^2 TEST

HYPOTHESES

H0: RDD=60 GREEN=60 BLUE=60
YELLOW=60 BROWN=60
THE FIVE DIFFERENT COLORS ✓
ARE EQUALLY DISTRIBUTED

HA: THE COLORS ARE NOT ✓
EQUALLY DISTRIBUTED

TEST STATISTIC

X^2 TEST

$E_i = n \cdot p_i$

$$\sum \frac{(O-E)^2}{E}$$ ✓

CRITICAL VALUE: 9,488 ✓

Poäng: (Points)

Tentamensservice/SU/typ_a

Uppg.nr.: (*Task no.*) 6

Lärarens kommentar: (*Teacher's note*)

DECISION RULE

REJECT HO IF:

tOBSERVED VALUE > CRITICAL VALUE

tOBSERVED VALUE > 9,488 ✓

B

TEST VARIABLE 8,9667 ✓

C

NOT REJECT THE NULL-HYPOTHESES AT THE 5% LEVEL OF SIGNIFICANCE

8,9667 < 9,488

WE CAN NOT BASED ON THE 5% SIGNIFICANCE LEVEL REJECT THAT THE COLORS ARE EQUALLY DISTRIBUTED

D

TYPE-1 ERROR. WHEN WE REJECT A TRUE NULL HYPOTHESES.

EXAMPLE: THE STUDENT TAKES A SMALL SAMPLE WHICH GIVES A SKEWED RERRESENTATION OF THE DISTRIBUTION OF THE POPULATION.

Poäng: (*Points*) 20

Uppg.nr.: (Task no.) 7

Lärarens kommentar: (Teacher's note)

A 18,408 ≈ 18 BOTTLES SOLD ✓

GR 50,381 +- 2,063 • 20 + 9,287 • 1

B TWO SIDED TEST

CRITICAL VALUE

2,306 |tOBS| > 2,306 ✓

TEST VARIABLE

GR 1,1809 ✓

H0: COEFFICIENT PRICE • AD = 0 ✓

HA: COEFFICIENT PRICE • AD ≠ 0

DECISION RULE

REJECT H0 IF |tOBS| > 2,306 ✓

CONCLUSION

MODEL 3 IS (NOT) BETTER. ✓

WE CAN (NOT) BASED ON THE 5% LEVEL OF SIGNIFICANCE REJECT THAT B_3 (PRICE • AD) IS EQUAL TO 0.

1,1809 < 2,306

TEST STATISTIC $\frac{(b_j - B_j^*)}{S_{bj}}$ ✓

Poäng: (Points) 10

Uppg.nr.: (*Task no.*) 7

Lärarens kommentar: (*Teacher's note*)

C

$R^2 = \frac{SSR}{SST}$

MODEL 2

$\frac{SSR - 242,980}{SST - 503,667}$ ✓

$R^2 = 0,4824$ ✓

INTERPRETATION:

48,24% OF THE VARIABILITY IN THE DEPENDENT VARIABLE (BOTTLES SOLD IN A WEEK) CAN BE EXPLAINED BY THE EXPLATORY VARIABLES B_1 (PRICE) AND B_2 (AD)

D

HYPOTHESES

H0: $B_1 = 0$ $B_2 = 0$ $B_3 = 0$ ALL COEFFICIENTS ARE EQUAL TO 0. ✓

HA: AT LEAST ONE COEFFICIENT IS (NOT) EQUAL TO 0.

F = 2,5383

P-VALUE = 1 - 0,99446 = 0,00554

P-VALUE: LOWEST SIGNIFICANCE LEVEL WHERE WE CAN REJECT THE NULL HYPOTHESES. 0,05 > 0,00554. WE CAN REJECT THE NULL HYPOTHESES.

Poäng: (*Points*) 7.5