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| YMH 210 İngilizce İletişim Becerileri  YMT 214 Vocational English II |  | Prof. Dr. Asaf Varol  Fırat University, College of Technology |
|  | **Ödev No: 01**  Homework #01 |  |
| Öğrencinin numarası: | 16541055 | |
| Öğrencinin Adı Soyadı: | Ferhat KORKUTATA | |
| Öğrencinin dersi aldığı şube ve gece/gündüz | Gündüz – A Şubesi | |

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| **Soru/Question 1)**  Use your own words to explain the following questions.  1-1 What is sampling bias and sampling error?  1-2 How are they different?  1-3 How can each be avoided? |
| **Cevap/Answer 1)**  1-1 Sampling Bias : The sample does not represent the population due to the error in the sampling process. This distorts the results of the research or experiment, causing the results not to reflect the truth.  Sampling Error : In sampling, error can be defined as any difference between the average values ​​that were obtained through a study and the true average values ​​of the population being targeted.  1-2 Whereas error makes up all flaws in a study's results, bias refers only to error that is systematic in nature.  1-3 For Sampling Bias : One of the most effective methods that can be used by researchers to avoid sampling bias is simple random sampling, in which samples are chosen strictly by chance. This provides equal odds for every member of the population to be chosen as a participant in the study at hand.  For Sampling Error : Sampling errors can be reduced by the following methods: (1) by increasing the size of the sample (2) by stratification. Increasing the size of the sample: The sampling error can be reduced by increasing the sample size. If the sample size n is equal to the population size N, then the sampling error is zero. |

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| **Soru/Question 2)**  For each of the following confidence levels, determine the corresponding Z score.   |  |  |  |  | | --- | --- | --- | --- | | Confidence Level | Sampling Error (α) | Area Beyond Z | Z Score | | 95% | 0.05 | 0.0250 | ±1.96 | | 94% |  |  |  | | 97% |  |  |  | | 88% |  |  |  |   **Cevap/Answer 2)**   |  |  |  |  | | --- | --- | --- | --- | | Confidence Level | Sampling Error (α) | Area Beyond Z | Z Score | | 95% | 0.05 | 0.0250 | ±1.96 | | 94% | 0.06 | 0.0300 | ±0.53 | | 97% | 0.03 | 0.0150 | ±1.04 | | 88% | 0.12 | 0.0600 | ±1.65 |   !According to the standard normal probability table!  For %95 ; 1-0.0250=0.0750 => 1.90+0.06 = 1.96  ------------------------------------------------------------------------------------------------------------------------  For %94 ; 1-0.0300= 0.700 => 0.50 + 0.03 = 1.89  ------------------------------------------------------------------------------------------------------------------------  For %97 ; 1-0.0150= 0.850 => 1.00 + 0.04 = 2.17  ------------------------------------------------------------------------------------------------------------------------  For %88 ; 1-0.0600=0.0400=> -1.7 + 0.05 = -1.65 => 1.56 |

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| **Soru/Question 3)**  Construct the 95% confidence interval for each of the sample outcomes with appropriate formula.   |  |  |  | | --- | --- | --- | | a. | b. | c. | |
| **Cevap/Answer 3)**  a.  **Formula => CI =**  ± Z \*N => For %95 Z=1.96  **CI** = 12 ± 1.96 \*2.3 / = 12 ± 0.395 => [ 12.395 – 11.605 ]  ------------------------------------------------------------------------------------------------------------------------  b.  ± T\* S/N-1 => For %95 t= 2.02  **CI =** 105 ± 2.02 \* 10.5 / 225-1 = 105 ± 1.375 => [ 106.375 – 103.625 ]  ------------------------------------------------------------------------------------------------------------------------  c.  **Formula => CI =**  ± Z \* Pu(1-Pu)/N => For %95 Z=1.96  **CI =** 0.78 ± 1.96 \* (0.05(1-0.05)/300) =0.78±0.0565 =>[ 0.8365 – 0.7235 ] |

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| **Soru/Question 4)**  A researcher has gathered information from a random sample of 180 household. From the sample, the researcher found that an average 2.5 people resides in each house hold, with the standard deviation of 0.35. Answer the following sub-questions to construct confidence intervals to estimate the population mean. Use the 95% level.  A. Identify the following elements:  (1) Sample size (N) = ?  (2) Is it a big sample?  (3) Sample mean () = ?  (4) Is population standard deviation () known or unknown?  (5) Sample standard deviation (S) = ?  (6) Sampling error (α) = ?  (7) Corresponding Z score to the sampling error (α) = ?  B. Which formula would you use to solve the problem?  C. Compute and construct confidence intervals to estimate the population mean. Use the 95% level. |
| **Cevap/Answer 4)**  A. Identify the following elements:  (1) Sample size (N) = 180  (2) Is it a big sample? = 180>100 Yes, It’s big sample  (3) Sample mean () = 2.5  (4) Is population standard deviation () known or unknown? = Unknown  (5) Sample standard deviation (S) = 0.35  (6) Sampling error (α) = 0.05  (7) Corresponding Z score to the sampling error (α) = 1.96  B. Which formula would you use to solve the problem?  ± T \* S /N-1  C. Compute and construct confidence intervals to estimate the population mean. Use the 95% level.  2.5 ± 2.02 \* 0.35 / = 0.051 [ 2.551 – 2.449 ] |