UJI SEKUENSIAL *MEAN* DISTRIBUSI NORMAL DENGAN *VARIANS* DIKETAHUI

SKRIPSI

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SURABAYA
2008

Primita Miradani, 2008. **Uji Sekuensial *Mean* Distribusi Normal dengan *Varians* Diketahui**. Skripsi ini dibawah bimbingan Drs. Eko Tjahjono dan Toha Saifudin S.Si, M.Si, Departemen Matematika Fakultas Sains dan Teknologi Universitas Airlangga.

ABSTRAK

Uji sekuensial merupakan suatu metode statistika inferensi yang memiliki karakteristik utama, yaitu banyaknya pengamatan yang diperlukan pada suatu percobaan tidak ditetapkan sebelum percobaan. Keputusan untuk mengakhiri percobaan tergantung pada hasil pengamatan yang telah dilakukan.

Keputusan uji sekuensial *mean* distrbusi normal dengan *varians* diketahui pada taraf kesalahan α, β untuk $H_0: \mu = \mu_0$ lawan $H_1: \mu = \mu_1$ adalah:

1) Lanjutkan percobaan jika

$$\left(\frac{\sigma^2}{\mu_1-\mu_0}\log\frac{\beta}{1-\alpha}\right)+\left(\frac{m(\mu_1+\mu_0)}{2}\right) < \sum_{k=1}^{m} x_k < \left(\frac{\sigma^2}{\mu_1-\mu_0}\log\frac{1-\beta}{\alpha}\right)+\left(\frac{m(\mu_1+\mu_0)}{2}\right)$$

2) Tolak H_0 jika

$$\sum_{k=1}^{m} x_k \geq \left(\frac{\sigma^2}{\mu_1-\mu_0}\log\frac{1-\beta}{\alpha}\right)+\left(\frac{m(\mu_1+\mu_0)}{2}\right)$$

3) Terima H_0 jika

$$\sum_{k=1}^{m} x_k \leq \left(\frac{\sigma^2}{\mu_1-\mu_0}\log\frac{\beta}{1-\alpha}\right)+\left(\frac{m(\mu_1+\mu_0)}{2}\right)$$

Peluang proses sekuensial akan berakhir dengan penerimaan H_0 dapat dihitung dengan menggunakan "Fungsi Karakteristik Operasi (FKO)" yang memiliki bentuk umum:

$$L(\mu) \approx \frac{\left(\frac{1-\beta}{\alpha}\right)^{\frac{(\mu_1+\mu_0)-2\mu}{\mu_1-\mu_0}} - 1}{\left(\frac{1-\beta}{\alpha}\right)^{\frac{(\mu_1+\mu_0)-2\mu}{\mu_1-\mu_0}} - \left(\frac{\beta}{1-\alpha}\right)^{\frac{(\mu_1+\mu_0)-2\mu}{\mu_1-\mu_0}}}$$

Ekspektasi banyaknya sampel yang dibutuhkan pada percobaan dapat dihitung dengan menggunakan "Fungsi Rataan Ukuran Sampel (FRUS)" yang memiliki bentuk umum:

$$E_\mu(n) \approx 2\sigma^2 \frac{L(\mu)\log B + [1-L(\mu)]\log A}{\mu_0^2 - \mu_1^2 + 2(\mu_1-\mu_0)\mu}$$

Penerapan materi untuk suatu contoh kasus tentang 100 data pengepakan ekspor biji kopi robusta pada Kantor Pemasaran Bersama PT. Perkebunan Nusantara Cabang Surabaya ke *Hamburg Coffee*-Jerman Periode 1 November 2007. Berdasarkan simulasi pada data dengan 50 *running* uji sekuensial diperoleh 47 kali keputusan terima H_0, sehingga FKO $= \frac{47}{50} = 0.94$ dan diperoleh FRUS sebesar 6.08.

Kata Kunci : Distribusi Normal, Uji Sekuensial, Fungsi Karakteristik Operasi, Fungsi Rataan Ukuran Sampel.

Primita Miradani, 2008. **Mean's Sequential Test in Normal Distribution with Known Variance**. This script is under the guidence of Drs. Eko Tjahjono and Toha Saifudin S.Si, M.Si, Department of Mathematics, Faculty of Science and Technology, Airlangga University.

ABSTRACT

Sequential test is a statistical inference's method which has a main characteristic, it is the quantity of observations of experiments didn't fixed before the experiments started. The decision to end an experiment depends on the result of the observation before.

The decisions of mean's sequentials method in normal distribution with known variance at level α, β for $H_0:\mu=\mu_0$ versus $H_1:\mu=\mu_1$ are:

1) Continued the experiments if

$$\left(\frac{\sigma^2}{\mu_1-\mu_0}\log\frac{\beta}{1-\alpha}\right)+\left(\frac{m(\mu_1+\mu_0)}{2}\right)<\sum_{k=1}^{m}x_k<\left(\frac{\sigma^2}{\mu_1-\mu_0}\log\frac{1-\beta}{\alpha}\right)+\left(\frac{m(\mu_1+\mu_0)}{2}\right)$$

2) Refused the experiments if

$$\sum_{k=1}^{m}x_k\geq\left(\frac{\sigma^2}{\mu_1-\mu_0}\log\frac{1-\beta}{\alpha}\right)+\left(\frac{m(\mu_1+\mu_0)}{2}\right)$$

3) Accepted the experiments if

$$\sum_{k=1}^{m}x_k\leq\left(\frac{\sigma^2}{\mu_1-\mu_0}\log\frac{\beta}{1-\alpha}\right)+\left(\frac{m(\mu_1+\mu_0)}{2}\right)$$

The chance of sequential proccess with acceptance of H_0 can be formulated by using "The Operational Characteristic Function (FKO)" as:

$$L(\mu)\approx\frac{\left(\frac{1-\beta}{\alpha}\right)^{\frac{(\mu_1+\mu_0)-2\mu}{\mu_1-\mu_0}}-1}{\left(\frac{1-\beta}{\alpha}\right)^{\frac{(\mu_1+\mu_0)-2\mu}{\mu_1-\mu_0}}-\left(\frac{\beta}{1-\alpha}\right)^{\frac{(\mu_1+\mu_0)-2\mu}{\mu_1-\mu_0}}}$$

The expectation of the quantity of sample which is needed on an experiment can be formulated by using "The Sample Size's Mean Function" as:

$$E_\mu(n)\approx 2\sigma^2\frac{L(\mu)\log B+[1-L(\mu)]\log A}{\mu_0^2-\mu_1^2+2(\mu_1-\mu_0)\mu}$$

The theory of sequential test will be applied to 100 PT. Perkebunan Nusantara Cabang Surabaya's data of robusta coffee beans which exported to *Hamburg Coffee*-Germany by 1st, 2007. Based on data's simulation with 50 running of sequential test, obtained 47 times of acceptance H_0 results, makes FKO

$$=\frac{47}{50}=0.94 \text{ and FRUS }=\frac{\sum_{i=1}^{50}n_i}{50}=\frac{304}{50}=6.08.$$

Key Word : Normal distribution, Sequential test, The Operational Characteristic Function, The Sample Size's Mean Function.