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Socioeconomic Factors Affecting the Work Participation

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ABSTRACT
This study aims to analyze the influence of socio-economic factor variables on the work participation of the elderly population. The data used in this research is secondary data sourced from the Central Statistics Agency obtained from the National Labor Force Survey (SAKERNAS). This research uses Logistic Regression Analysis (Binary Logistics). The results of the study show that socio-economic factors (age, number of household members, education level, gender and income of household members) have a significant influence on the participation of the elderly population, meaning that every increase of 1 unit of social-economic factors can increase the participation of the elderly population.

***Keywords:* socioeconomic factors; participation of the elderly population; binary logistic regression**

INTRODUCTION

The elderly population in Indonesia has increased significantly every year. According to the Directorate General of Population and Civil Registration (Dukcapil), there were 30.16 million elderly people in Indonesia in 2021. Elderly residents are those aged 60 years and over. This group accounts for 11.01% of Indonesia's total population of 273.88 million people. If broken down again, as many as 11.3 million people (37.48%) elderly population aged 60-64 years. Then there are 7.77 million (25.77%) aged 65-69 years (Badan Pusat Statistik, 2021). After that, there are 5.1 million people (16.94%) aged 70-74 years, and 5.98 million (19.81%) aged over 75 years. When viewed from socioeconomic factors, the majority or 43.29% of the elderly population comes from households with the bottom 40% expenditure group. Then, the distribution is also mostly in the household group with 40% of the middle, which is 37.4%. Those in the top 20% are only 19.31%. There are still many elderly who are in low economic conditions need to be a concern because the elderly are not a productive age to work.

Socio-economic is the position or position of a person in a community group determined by the type of economic activity, education and income. In its discussion, social and economic are often the object of different discussions. Research Vilhelmson et al., (2022) it found that the older the elderly population, the more concentrated work participation was in those with high levels of well-being. This can happen because, in fact, at a younger age, the non-working elderly population consists mostly of less educated people and disabled people who are estimated to have low welfare. Relatively wealthier individuals are more likely to work because they have access to suitable and simple working conditions because they enjoy working more than less prosperous elderly.

The essence of work participation is activities carried out by residents aged 15 years and over which can be in the form of working / trying to earn income / looking for work Meanwhile, the definition of elderly residents is residents who are 60 years old and over. So, the work participation of the elderly population is an activity of residents aged 60 years and over which can be in the form of trying to help earn income/find work. The work participation of the elderly population is also influenced by gender and level of education possessed (Dang & Sukontamarn, 2019; Saputro et al.,

2023). Women with low levels of education have more difficulty in obtaining jobs when compared to men who have the same level of education. Chattopadhyay et al., (2022) Cepello (2021) and Yuying & Jing (2022) both concluded that the elderly with more male sex who remain in the workforce even though they have entered old age. In general, due to age, the elderly will experience various declines in conditions and abilities both physically and psychologically. However, on the other hand, the elderly are also required to meet the needs of daily life, such as the need for balanced nutritious food, regular health checks, treatment due to aging diseases and recreational needs. Therefore, the elderly also need to be utilized to increase independence in order to help themselves and their families so that they are no longer a burden on others. Based on Sakernas 2021 data, of the total elderly in Indonesia, 10.82 percent of the total Indonesian population is working.

The high percentage of the elderly who work basically not only reflects the ability of the elderly to keep working, but on the other hand can also be interpreted as the low level of welfare of the elderly, so they are forced to still have to work to make ends meet (Raab, 2020). This is due to the rapid increase in the number and proportion of the elderly population in Indonesia, apparently not followed by the same increase in social security efforts, so that many elderly people with all limitations of their physical condition continue to work. Acharya et al., (2022) states several reasons that affect the elderly to work. First, there are still many elderly who remain physically and mentally strong. Second, the plunge of the elderly into the job market due to economic pressure. Third, reason is based more on self-actualization motives or emotions. This statement is also supported by several research results that show that the involvement of the elderly is influenced by various socioeconomic factors. These socioeconomic factors include education, family income, status in the family, number of dependents, health (Phyo et al., 2022; Santhalingam et al., 2021; Santoso et al., 2022).

LITERATURE REVIEW

Elderly Population

Potential elderly are elderly residents who are included in the labor force. Elderly is mostly found in developing countries and countries that do not have social benefits for old age Huda (2020); Thaithatkul et al., (2022). Based on the results of the analysis, it is known that the variables of age, marriage status, health, household income, number of dependents and parental benefits simultaneously affect the work participation of elderly residents (Rahman & Permadi, 2020). Age, and household income, partially have a negative and significant effect on the work participation of the elderly population while health has a partial but not significant negative effect, and the number of dependents has a partial and significant positive effect on the work participation of the elderly population.

Work Participation of the Elderly Population

The essence of work participation is activities carried out by residents aged 15 years and over which can be in the form of trying to help earn income to find work Meanwhile, the definition of elderly residents is residents who are aged 60 years and over (Yurina & Misla, 2023). So, the work participation of the elderly population is an activity of residents aged 60 years and over which can be in the form of working/trying to earn income/find work.

Socioeconomic Factors

Socio-economic is the position or position of a person in a community group determined by the type of economic activity, education and income (Makalalag et al., 2023). In its discussion, social and economic are often the object of different discussions. Economic factors are factors related to finance, while non-economic factors are related to living conditions that are not related to finance. Economic factors such as poverty levels (fulfillment of clothing, food, and shelter).

Age

Age is the period of time since the existence of a person and can be measured using units of time viewed in chronological terms, normal individuals can see the same degree of anatomical and physiological development. Age is also the length of time lived or existed (since birth or held). In terms of age, the older you are, the more experienced you will be so that the better you can manage

your business (He et al., 2020). However, on the other hand, the older the physical ability decreases so that the more labor assistance is needed, both within the family and from outside the family.

Number of Household Members

Number of Household Members The number of all family members consisting of the head of his own family, his wife / husband and or with his children (children) and other people or adopted children who participate in the family who are not married, both those who live in the same house and those who do not live in the same house (Jones et al., 2023). A family is two or more individuals who join and are also related by blood, marriage, adoption to one household that interacts with each other in building and maintaining a culture. The family consists of husbands, wives and children, which is a social unit in society. The position of family members in the household has become an intermediary in community life.

Education Level

Education is one of the most important aspects for our country, Indonesia because it will affect the progress or retreat of Indonesia. But the reality now is that not all parties pay attention and contribute to Indonesian education. In terms of science, educational factors are goals, tools, educators and students and the environment Cicih & Agung (2022); Ju (2020). This means that education must meet these five aspects. The output will be different if the five aspects are not considered optimally.

Gender

Gender is the difference between women and men biologically from birth. Gender is an individual characteristic that is further also known to affect the working status of the elderly population. Gender It deals with the bodies of men and women, where men produce sperm, while women produce eggs and are biologically capable of menstruating, conceiving and breastfeeding (Pusparini, 2022). The biological differences and biological functions of men and women are not interchangeable between the two, and their functions remain with men and women in all races on earth.

Household Member Income

Household income Household income is the income received by the household concerned both from the income of the head of the household and the income of household members (Yanda et al., 2022). Household income can come from remuneration for factors of labor production (wages and salaries, profits, bonuses, etc.), remuneration of capital services (interest, profit sharing, etc.), and income derived from the provision of other parties (transfers)

RESEARCH METHODS

This research was conducted in Gorontao City with a period starting from December. The object of this study is economic factors that affect the involvement of the elderly population in the job market in Gorontalo City. This study used the Logistic Binary Regression method. The Logistic Binary Regression Method is data sourced from SUSENAS "raw data". To analyze the factors influencing the involvement of the elderly in the labor market, a binary logistic regression model with individual units of the elderly in the household is used. The use of the binary logistic regression model is due to the dependent variables used consisting of two categories, namely whether or not the elderly are involved in the job market (working). While the independent variables are the socioeconomic characteristics of individuals and households of the elderly.

Population and Sample

The number of samples in this study was 152 elderly residents in Gorontalo City according to the National Labor Force Survey (Sakernas). The data that suits the needs of this study is the data of the National Labor Force Survey (Sakernas) of Gorontalo Province in 2021 The author in making this study also collected data by collecting journals and articles that have been published. Data analysis is carried out quantitatively, namely by describing the influence of the independent variable on the dependent variable, and which independent variable has the most influence on the dependent variable (poverty), which is carried out using the next Binary Logistic Regression analysis from the

value of the coefficient obtained, described by discussing the results of research in accordance with relevant theories and literature.

Descriptive Statistical Analysis
Descriptive statistical analysis is an analysis used to analyze data by describing or describing the data that has been collected as it is without intending to make conclusions that are generally applicable (Aulia & Yulianti, 2019). The descriptive statistical analysis used in this study is the average value (mean), maximum, minimum, and standard deviation values to describe the variables of sales growth, leverage, operating capacity, and company size.

Binary Logistic Regression Analysis
Binary logistic regression is a data analysis method commonly used in finding a relationship between variable y or binary response (dichotomus) with variable x or categorical predictors (Elza Fitri et al., 2022). Nurdiansah & Khikmah, (2020) explaining that the binary logistic regression method is one of the methods used in describing the relationship between one or more independent variables whose independent variables are included in the category of discrete variables with two possibilities, namely success and failure. A successful event will usually be denoted with Y=1, while a failed event will be denoted with Y=0.

$$\text{Ln } p/((1-p)) = \beta\_0+\beta\_1 X\_1+\beta\_2 X\_2+\beta\_3 X\_3+\beta\_4 X\_4+\beta\_5 X\_5+\beta\_6 X\_6+\varepsilon$$

where:
Ln: Logaritma Natural
B0 + B11: Commonly known equations in OLS
While P Accent is a logistic probability

β0	:	Konstanta
β1	:	Age regression coefficient
X1	:	Business Hours
β2	:	Regression coefficient of number of household members
X2	:	Number of Household Members
β3	:	Education Level regression coefficient
X3	:	Education Level
β4	:	Sex regression coefficient
X4	:	Gender
β5	:	Regression coefficient of ART income
X5	:	ART Revenue

RESEARCH RESULTS AND DISCUSSION

Descriptive Statistical Analysis

Variables in the study. The variables studied were Age X1, Number of Household Members X2, Education Level X3, Gender X4 and Household Member Income X5 sebagai variabel independent and Participation of elderly workers as a dependent variable. The data results are depicted by showing values in the form of average value (mean), highest value (maximum), lowest value (minimum), and standard deviation. The results of data analysis are presented in a descriptive statistical table with a research sample (n = 152), as follows:

Table 1. Descrptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
X1	152	0	1	.86	.353
X2	152	0	1	.44	.498
X3	152	0	1	.47	.501
X4	152	0	1	.61	.490
X5	152	0	1	.57	.497
Y	152	0	1	.56	.498
Valid N (listwise)	152				

Source: Sakernas data processed 2023

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Based on the table above, it can be seen that the number of sample data used in this study was 152 samples from the 2022 KOR National Labor Force Survey (SAKERNAS). Table 1 describes the variables statistically and shows descriptive statistical results regarding the independent and dependent variables in this study.

Logistic Regression Analysis

This study will be tested using the SPSS (*Statistical Package for Social Science*) program, using a binary logistic regression analysis tool. This study uses logistic regression because the dependent variable Participation of elderly workers (Y) in the form of elderly workers is data that uses a nominal scale, namely dummy (1 and 0).

Model Conformity Test (Goodnes of fit)

Hosmer and Lemeshow test to see the fit or FIT of the model (Surjanovic & Loughin, 2023).
Hipotesis:
Ho: Model FIT (*p value* > 0,05)
H1: Model no FIT (*p value* < *0,05*)
where the value 0 does not work and the value 1 works.

Table 2. Model Conformity Test (Goodnes of fit)

Step	Chi-square	Df	Sig.
1	10,216	7	,177

Source: Susenas data processed 2023

From the table obtained values of sig.0.177 > 0.05 then H0 is accepted (FIT Model), meaning the Binary Logistic Regression model is feasible to be used for further analysis because there is no real difference between the predicted classification (predicted probabilities) and the observed classification (observed probabilities).

Overall Significance Test of the model (Omnibus Tests of Model)

A significant test of the whole model was carried out to determine the effect of the independent variable on the non-free variable together (overall) in the model presented in the following table 3;

Table 3. Overall Significance Test of the model (Omnibus Tests of Model)

		Chi-square	Df	Sig.
Step 1	Step	56,891	5	,000
	Block	56,891	5	,000
	Model	56,891	5	,000

Source: Susenas data processed 2023

From the table obtained sig value. 0.000 < 0.05, then H0 is rejected and Ha is accepted meaning that the independent variables of number of age, number of household members, education level, gender and income of household members have a positive effect on the participation of elderly workers.

Partial Test of Model Parameters

Testing of logistic regression coefficients was partially performed with the Wald test. Determine the sig level of 5% (α = 0.005) and the test criteria as follows.

1. If the *p-value* > 0.005, Ho is accepted and Ha is rejected, meaning that the independent variable has no effect on the dependent variable
2. If the *p-value* < 0.005, Ho is rejected and Ha is accepted, meaning that the independent variable has an effect on the dependent variable.

Table 4. Partial Test of Model Parameters

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1[a]	**X1(1)**	1,557	,605	6,626	1	,010	4,746
	X2(1)	1,022	,429	5,669	1	,017	2,778
	X3(1)	1,033	,423	5,954	1	,015	2,810
	X4(1)	1,123	,447	6,295	1	,012	3,073
	X5(1)	1,650	,442	13,958	1	,000	5,209
	Constant	-3,480	,729	22,786	1	,000	,031

Source: Susenas data processed 2023

Based on the test results above, the independent variable that has a significant effect on the dependent variable is an independent variable that has a significance value of the Wald test less than *p Value* < 0.05.

1. The significant value of the variable number of 60-69 years old, namely X1(1) of 0.010 < 0.05, then H0 is rejected and Ha is accepted, meaning that age has a significant effect on the participation of elderly population workers with a coefficient value of 1.557.≤
2. The significant value of the variable number of household members ≥4 people, namely X2(1) of 0.017 < 0.05, then H0 is rejected and Ha is accepted, meaning that the number of household members has a significant effect on the participation of elderly resident workers with a coefficient value of 1.022.
3. The significance value of the variable level of high school education is X3(1) of 0.015 < 0.05, then H0 is rejected and Ha is accepted, meaning that the level of education has a significant effect on the participation of elderly workers with a coefficient value of 1.033.≥
4. The significance value of the male sex variable, namely X4(1) of 0.012 > 0.05, then H0 is rejected and Ha is accepted, meaning that gender has a significant effect on the participation of elderly population workers with a coefficient value of 1.123.
5. The variable significance value of income of the elderly population ≤1,000,000, namely X5(1) of 0.000 > 0.05, then H0 is rejected and Ha is accepted, meaning that the income of household members has a significant effect on the participation of elderly resident workers with a coefficient value of 1.650.

Binary Logistic Regression Modeling and Odds Ratio

Odds ratio is used to facilitate the interpretation of binary logistic regression models, where it is known that the partial parameter siginfication test that significantly affects the dependent variable is the number of age, hours worked, employment, employment status and education level. So the binner logistic regression model of all independent variables is formed as follows:

$$\text{Ln} = \frac{\exp\left(-3{,}480 + 1{,}557X1(1) + 1{,}022X2(1) + 1{,}033X3(1) + 1{,}123X4(1) + 1{,}650X5(1)\right)}{1 + \exp\left(-3{,}480 + 1{,}557X1(1) + 1{,}022X2(1) + 1{,}033X3(1) + 1{,}123X4(1) + 1{,}650X5(1)\right)}$$

Information:
X1: Age
X2: Number of Household Members
X3: Education Level
X4: Gender
X5: ART Revenue

Furthermore, the value of the odds ratio is as follows:
The Odds Ratio value of the independent variable of economic factors is as follows:

a. The Odss ratio of the age independent variable X1 (1) with the elderly population category aged ≤60-69 years has a 4,746 times chance of job participation. This shows that the working elderly population ≤60-69 years has a tendency of 4,746 times job participation than the elderly population aged ≥70 years.

b. The odds ratio of the independent variable Number of Household Members X2(1) with the category of number of household members of senior residents ≥4 people has a 2,778 times chance of employment participation. This shows that the number of household members ≥4 people has 2,778 times the chance of employment participation than the number of household members of 1-2 people.
c. The odds ratio of the independent variable education level X3(1) with the category of elderly population with education level > high school has 2,810 times the chance of job participation than senior population with education level < junior high school. This shows that the elderly population with > level of education has a 2,810 times tendency in work participation than households with < level of education.
d. The odds ratio of the independent variable Gender X4(1) with the category of elderly population who are male has a chance of 3.073 times in job participation, which means that the male sex has a tendency of 3.073 times the participation of elderly resident workers than the elderly population who are female.
e. The odds ratio of the independent variable Income with the income category of the elderly population ≤1,000,000 is 5,209 times in job participation, this shows that the income of the elderly population ≤1,000,000 has a tendency in job participation rather than the income of the elderly population ≥1,000,000.

Accuracy of Classification

Classification accuracy calculates the value of classification accuracy between the actual value and the prediction value obtained from the model that has been formed, the calculation is obtained from the table classification table (Lelisho et al., 2022). From the results of the parameter use classification table, the overall percentage model value or overall percentage value is obtained where this result shows how much the percentage of influence of the independent variable on the dependent variable. Here is table 5 classification accuracy as follows:

Table 5. Classification Accuracy

Observed			Predicted		
			Elderly worker participation		
			Does not work	Work	Percentage Correct
Step 1	Elderly worker participation	Does not work	42	25	62,7
		Work	20	65	76,5
	Overall Percentage				70,4

Source: Susenas data processed 2023

Based on table 5 shows that the model's ability to predict the work and non-work of an elderly person is 70.4%. From the table above, the possibility of working elderly is 76.5% of the total sample of 152 data. Meanwhile, the possibility of the elderly not working is 62.7% of the total sample of 152 data.

DISCUSSION

Socioeconomic factors include variables (age, number of household members, education level, gender, household member income). Based on the partial test of the model variable, there is a significant relationship smaller than α=5% on the participation of elderly workers and the tendency of the odds ratio value which can be seen from the value of exp (β) to the participation of the elderly population. The following discusses the impact of each socioeconomic variable on the work participation of the elderly population.

From the results of the analysis of age variables, it has a positive and significant effect on the participation of elderly resident workers in Gorontalo City in 2022 These results can be interpreted that working households ≥60-69 years have a 5,764 times chance of having the tendency to have the

participation of elderly people than households working ≤70 years. In general, households that have a younger age will affect their work participation higher, in this case the opportunity for income or income will be greater, compared to the elderly population who have a number of older years and over lower work participation due to weak conditions and labor. These results align with research from Gusti Ayu Arini et al (2020) namely the participation of the elderly population in Denpasar Province with the results of processing, every increase in the age of workers carried out by the elderly population, the participation of workers is low 0.90 times smaller than before the increase in age. This condition occurs because as age increases, the opportunity to get income or income is getting smaller.

The Effect of The Variable Number of Household Members

From the results of the variable analysis of the number of household members has a positive and significant effect on the participation of elderly resident workers in Gorontalo City in 2022 This result can be interpreted that households that work 1-3 people have a 9,533 times chance of having the tendency to have the participation of elderly resident workers than households that work 4-6 people. In general, households that have a smaller number of household members of 1-3 people will affect their work participation higher, in this case the opportunity for income or income will be greater, compared to the elderly population who have a large number of household members 4-6 people, work participation is lower because more have the needs of household members such as children and wives.

The Effect of Variable Education Levels

From the results of the variable analysis, the number of household members has a positive and significant effect on household poverty in Gorontalo City in 2023 with an odds ratio of 2,620. These results can be interpreted that households with ≥ high school education level have a 2,620 times more likely to have senior resident worker participation than households with ≤ junior high school level. In general, households that have a high level of education will have a better life in the household, in this case have a permanent job so that they can afford it in terms of household economy. But this is in contrast to this study, where households that have a ≥high school education level tend to experience poverty. This can happen because households with ≥SMA education levels (SMA, D1, S1, S2, S3 and others) find it difficult to find work due to the lack of job opportunities, and many existing jobs are sometimes not in accordance with their profession. So many households with > education choose to be unemployed.

This problem causes poverty in households. Therefore, households with ≥SMA education levels (SMA, D1, S1, S2, S3 and others) cannot guarantee that these households are out of poverty. Study Astika Putra & Yuliarmi, (2022) Supporting the results of this study is that the lower the education level of the elderly population, the tendency of the elderly population to not have a job.

The Effect of Gender Variables

Based on the partial test results, reject the null hypothesis (H0) if the p-value is significant <0.05. The number of sexes X4 (1) obtained a significant value of 0.032 means that there is a significant influence on the participation of workers of the elderly population with an odds ratio or exp(B) value of 2.919 times, meaning that the male sex has a tendency to work participation of the elderly population 2.919 times than the number of female sexes. Based on data from the 2022 KOR National Labor Force Survey (SAKERNAS) in Gorontalo City, it shows that the sex percentage of the elderly population in Gorontalo City with a small female gender percentage classification is 47%, while the percentage of male sex is greater at 53%. From the available data, with the greater male sex it is known that the lower the sex, the tendency of the elderly population not to have a job. These results are in line with research conducted by Desanti & Ariusni (2021) which states that male sex variables have a significant influence. Thus it is known that the lower the sex of the elderly population, the tendency of the elderly population to not have jobs.

The Effect of Household Members' Income Variables

Based on the partial test results, reject the null hypothesis (H0) if the p-value is significant <0,05. The number of opinions of household members X5(1) obtained a significant value of 0.000 meaning that there was a significant influence on the participation of elderly resident workers with an odds ratio or exp(B) value of 0.057 times, meaning the amount of income ≥1.000.000 has a tendency for the employment participation of the elderly population to be 0.057 times the amount of income ≤1.000.000. Based on data from the 2022 KOR National Labor Force survey (SAKERNAS) in Gorontalo City, it shows that the percentage of elderly household members in Gorontalo City is classified as the percentage of income ≥1.000.000 smaller at 41%, while the percentage of income ≤1000.000 greater at 59%. From the existing data, with the amount of income of household members ≤1.000.000 It is better known that the lower the income, the tendency of the elderly population not to have worker participation. These results are in line with research conducted by Raab (2020). which states that the income variable ≤1.000.000 has a significant influence. Thus, it is known that the lower the income of the elderly population, the tendency of the elderly population to not have a job.

CONCLUSION

Socioeconomic factors include (age, number of household members, education level, gender, household member income).

1. The number of ages 60-69 years X1(1) obtained a significant value of 0.006 means that there is a significant influence on the participation of elderly population workers with an odds ratio or exp(B) value of 5.764 times the percentage of 60-69 years of age greater at 58%, while the number of ages >70 year with smaller category at 42%.
2. The number of household members, namely X2(2), obtained a significant value of 0.135, meaning that there is a significant influence on household poverty with an odds ratio or exp(B) value of 9.533 times, the classification of household members 1-3 is greater at 60%, while the number of household members 4-6 people has a percentage of 40%.
3. The level of education, namely X3(1), obtained a significant value of 0.022, meaning that there is a significant influence on household poverty with an odds ratio or exp(B) value of 2.620 times the percentage of education level ≥SMA smaller at 30%, while the percentage of education level ≤SMP greater at 70%.
4. The number of gender X4(1) obtained a significant value of 0.012 means that there is a significant influence on the participation of elderly resident workers with an odds ratio or exp(B) value of 3.045 times, the percentage of female sex is small, which is 47%, while the percentage of male sex is greater at 53%.
5. The number of opinions of household members X5(1) obtained a significant value of 0.000, meaning that there was a significant influence on the participation of elderly resident workers with an odds ratio or exp(B) value of 5.565 times with a percentage classification of income ≥1.000.000 lIt is smaller at 41%, while the percentage of income is below ≤1000.000 greater at 59%.

To make it easier for the people of Gorontalo City to get out of the name of not having a job kuhus in elderly households, special attention needs to be paid from the government in an effort to increase household income, in this case expanding employment opportunities, especially to people with low education or elderly residents.

1. The elderly population needs to reevaluate the importance of education in the world of work.
2. The elderly population needs to look for other business opportunities besides the agricultural sector, so that they can increase household income.

This study contributes to the impact of the influence of socioeconomic factors on the work participation of the elderly population, especially in Gorontalo City. The limitations in this study are in terms of the approach used, for that to maximize this research future studies can use new approach models such as the *Structural Equation Model* (SEM-PLS)..

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