



# Developing a Software Package for Forecasting Mobile Communications Network Subscribers in Nigeria

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## ABSTRACT

This research work, which was conducted in the last quarter of the year 2008, investigated the number of Subscribers and forecasted growth trend on three different GSM service providers in Nigeria from 2009 to 2013. The methodology adopted is a descriptive survey through collection of data from Nigeria Communication Commission (NCC) and the service providers. The data were analyzed using linear regression analysis and the outcome of the analysis was used to develop a software package for forecasting the likely future growth pattern on the network of the providers.

**Keywords:** *Subscribers, Forecast, Survey, Software, GSM*

## 1. INTRODUCTION

The quantum development in the telecommunication industry all over the world is very rapid as one innovation replaces another in quick succession. A major breakthrough is the wireless telephone system, which comes in either fixed wireless lines or the global system for mobile communication (GSM) (Wojade, 2005).

Telecommunications infrastructures have always been provided by the Federal Government of Nigeria. In the National Development plans (2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup>), capital allocation to the communications sector averaged 3.73 percent of the total capital allocation. Although, prior to the introduction of GSM in 2001 there were over fifty Private Telecommunications Operators (PTOs) offering different forms of telecommunications services in Nigeria.(Chukwudebe *et al.*, 2001; Maduka 2004; Akinbinu, 2001).

In Nigeria, GSM licences were granted to three services providers; MTN, ECONET (now Airtel) and NITEL plc in 2001 with GLOBACOM coming on board in 2003 (Ajiboye *et al.*, 2007) Forecasting is very important in service design and project management. Forecasting is simply the scientific name for guessing what the future will bring. It deals with the future of technological parameters, characteristics, or achievement (Ayres, 1969; Bowonder and Rohatgi, 1975). Forecasts are generally expressed in terms of quantitative probability. They are neither purely speculative nor purely predictive

(Bright, 1968; Pyke, 1971; Rohatgi and Bowonder, 1975). There are several standard techniques available for forecasting, and each technique has its own assumptions, benefits and pitfalls. Some of the techniques rely on examining past data to predict the future.

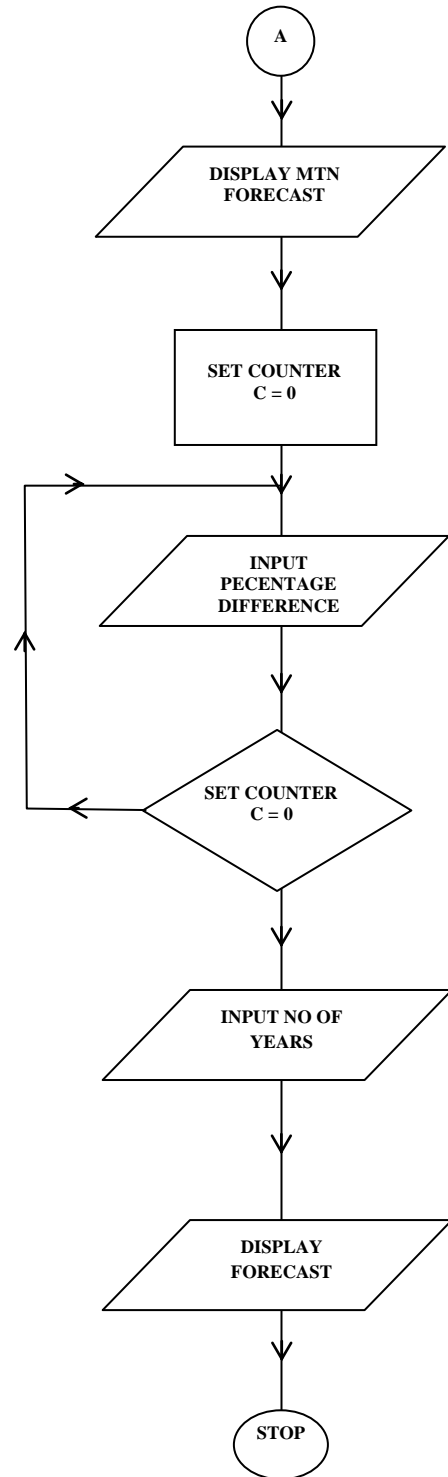
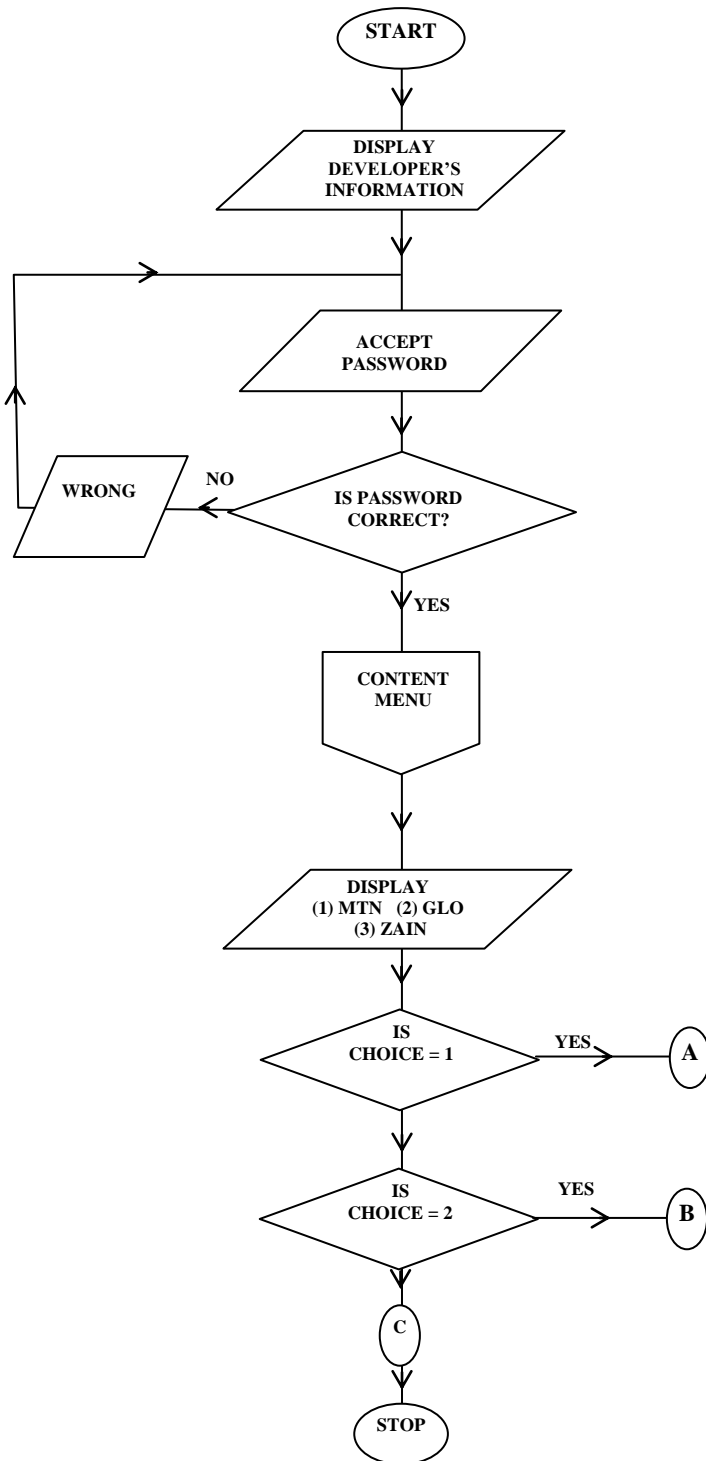
Regression analysis is a technique that can be applied to both time series data and causal data. Among its advantages are that it identifies the overall trend and does not have a lag problem. Furthermore, it can be used to project more than one period in advance. Regression analysis method is adopted in forecasting the GSM subscriber's growth pattern in this study.

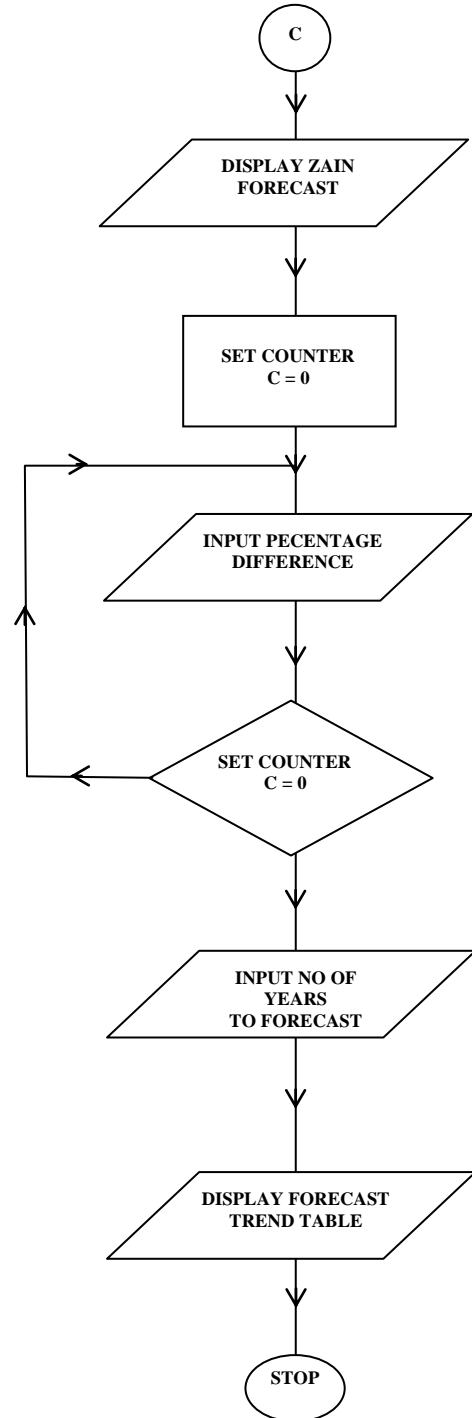
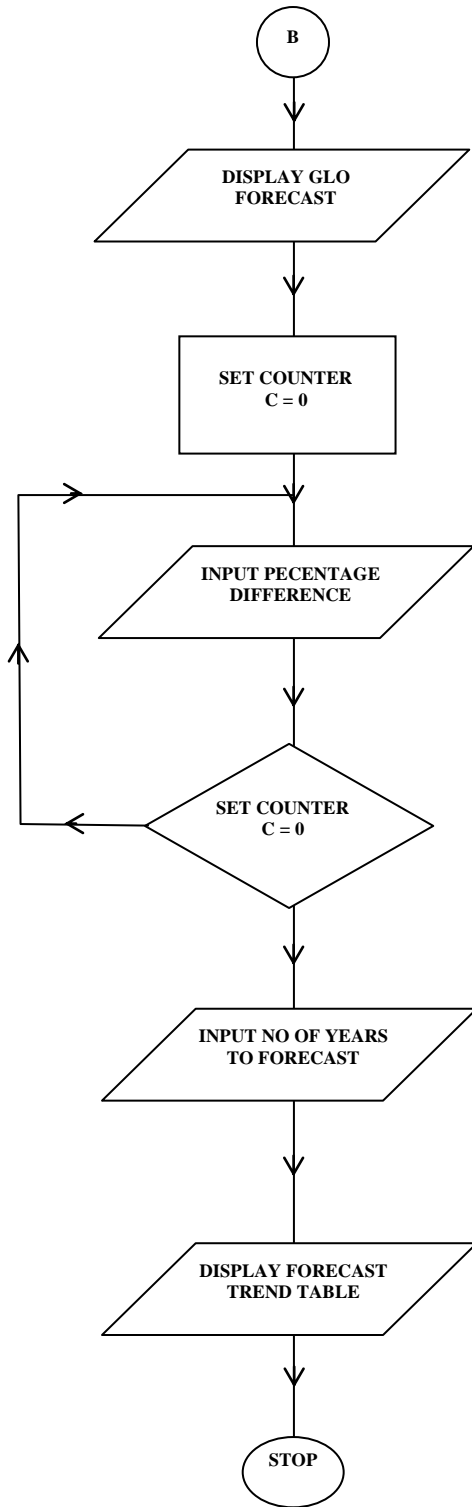
## 2. METHODOLOGY

The data covered August 2001 to 2008. Raw data were collected from: Nigeria Communication Commission (NCC) Regional office, Ibadan; MTN Nigeria Friendship Centre, Lagos; Zain Customer Care Centre, Ibadan and GLOBACOM Customer Care Centre, Ibadan. The data collected were analysed using simple linear regression. Based on the outcome of the analysis, Visual Basic programme (VB) was written to forecast the growth rate of subscribers on each of the GSM network providers. The visual basic programme was adopted because it is easier than other programs when writing code of higher graphics and it has more graphical user interface which makes it more versatile and adaptable.



### 3. PROGRAM FLOWCHART







#### 4. RESULT AND DISCUSSION

**Table 4.1: Number of Yearly Subscribers**

YEAR	2001	2002	2003	2004	2005	2006	2007	2008
MTN	98568	825000	165000	3300000	8342000	12281000	14986255	23080000
ZAIN	80630	87330	963472	2200000	3120000	9891010	12101000	17196482
GLO	-	-	400000	1900000	2780000	8456000	11681000	16004716
TOTAL	179198	912330	2440802	7400000	14242000	30628010	38760255	5628281198

(Source: NCC, MTN, GLOBACOM & ZAIN)

**Table 4.2: Annual Growth in Subscribers**

	2001	2002	2003	2004	2005	2006	2007
Total Subscriber	179198	912330	2440802	7400000	14242000	30628010	56282811
Differences		733122	1528472	4959198	6842000	16386010	8132245
Percentage(%)		409.1128	167.5405	203.1790	92.4594	115.0541	26.5517

(Source: NCC)

#### MTN NIGERIA SUBSCRIBER DATA

**Table 4.3: MTN Subscribers from 2001 – 2008**

2001	2002	DIFFERENCES	PERCENTAGE (%)
98568	825000	726432	736.986
2002	2003		
825000	1650000	825000	100
2003	2004		
1650000	3300000	1650000	100
2004	2005		
3300000	8342000	5042000	152.7879
2005	2006		
8342000	1228100	3939000	47.2189
2006	2007		
12281000	14986265	2700565	21.9898
2007	2008		
14986263	23080000	8093735	54.0076

(Source : MTN FRIENDSHIP Centre & www.mtn .com)

#### ZAIN NIGERIA SUBSCRIBER DATA

**Table 4.4 ZAIN Subscribers from 2001-2008**

2001	2002	DIFFERENCE	PERCENTAGE (%)
80630	87330	6700	8.309562



<b>2002</b>	<b>2003</b>		
87330	963472	6142	7.01248
<b>2003</b>	<b>2004</b>		
963472	2200000	2106528	218.6393
<b>2004</b>	<b>2005</b>		
2200000	3120000	1010000	45.9091
<b>2005</b>	<b>2006</b>		
3120000	9891010	6681000	214.135
<b>2006</b>	<b>2007</b>		
9891010	12101000	2210000	22.3435
<b>2007</b>	<b>2008</b>		
12101000	17196482	4967332	41.0489

(Zain Care Centre & [www.Zain.com](http://www.Zain.com))

**GLOBACOM NIGERIA SUBSCRIBER DATA**  
**Table 4.5 GLOBACOM Nigeria Subscribers (2003-2004)**

<b>2003</b>	<b>2004</b>	<b>DIFFERENCE</b>	<b>PER(%)</b>
400000	1900000	1500000	375
<b>2004</b>	<b>2005</b>		
1900000	2780000	880000	46.3158
<b>2005</b>	<b>2006</b>		
2780000	8456000	5676000	204.1727
<b>2006</b>	<b>2007</b>		
8546000	11681000	3255000	38.1386
<b>2007</b>	<b>2008</b>		
11681000	16004716	4323716	37.0149

(Source: [www.gloworld.com](http://www.gloworld.com))

Based on the tables above, a program was written and tested for the next five years. The results of the forecast are as tabulated below. The program output is as shown in the appendix.

**FORECAST RESULTS**  
**Table 4.6: Five years forecast outcome in Millions**

	2009	2010	2011	2012	2013
MTN	414.7269	334.1991	253.6713	173.1434	92.6156
ZAIN	66.3022	70.7442	75.1862	79.6282	84.0702
GLO	32.0905	57.0297	146.1499	235.2706	324.3903

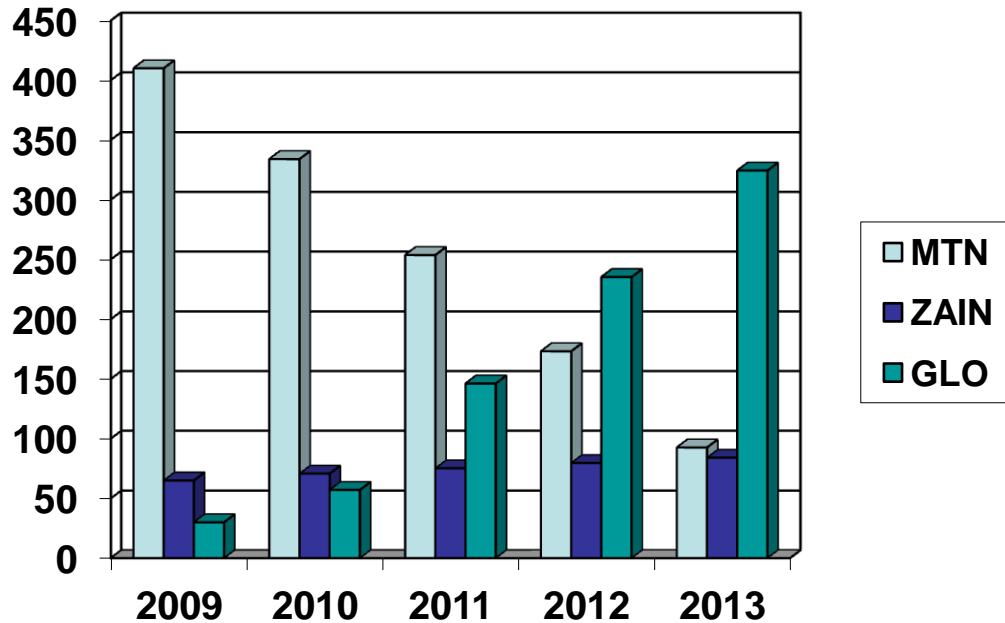


Figure 1: Forecasted Growth Rate for the Providers from 2009 to 2013

## 5. CONCLUSION

It was observed that the subscribers' growth rate differs annually among the services providers. The study deduced that MTN Nigeria will initially be taken lead in the subscribers' growth rate (year 2009) but will start declining in subsequent years under consideration (year 2010 to year 2013). Globacom exhibited the contrary as there is appreciation in the growth pattern from the year 2009 to the year 2013. Zain Nigeria had an arithmetical progression in growth rate of subscribers over the years under consideration (2009 - 2013). However the increment rate is quite low when compared to the increment rate of Zain Nigeria and the decrement rate of MTN Nigeria.

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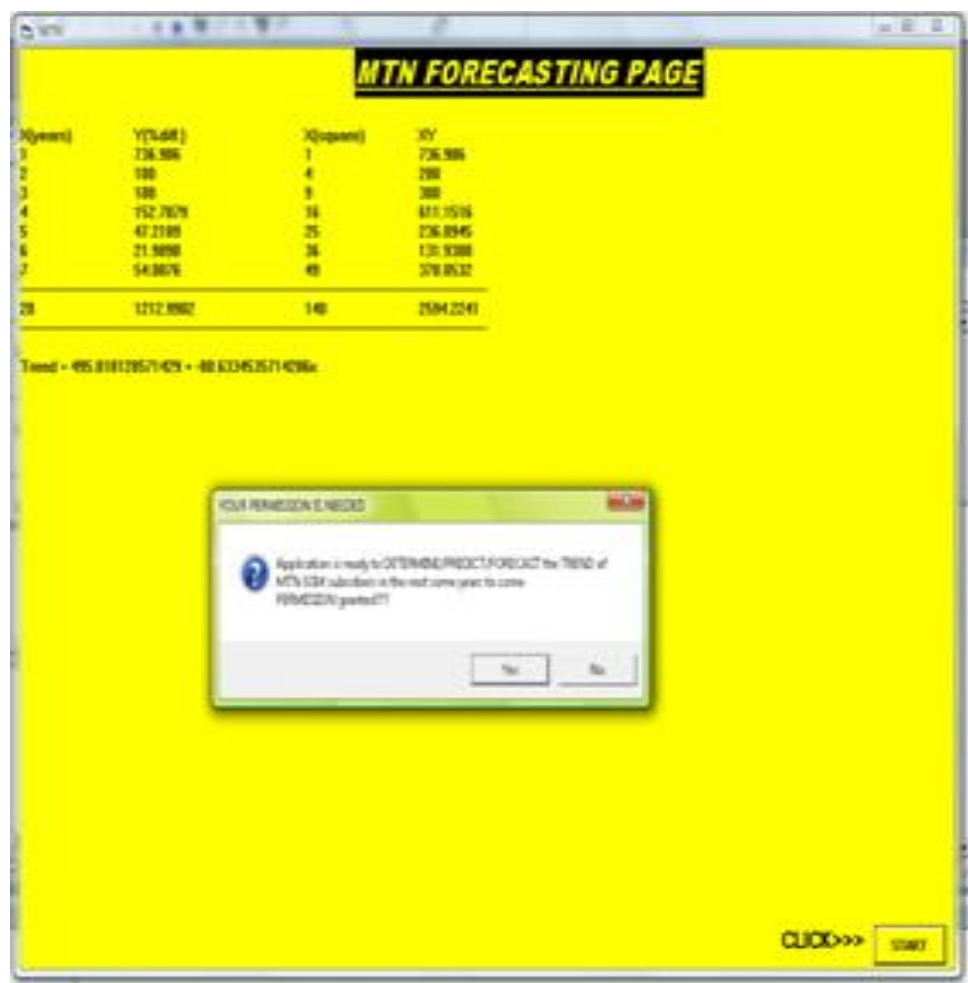


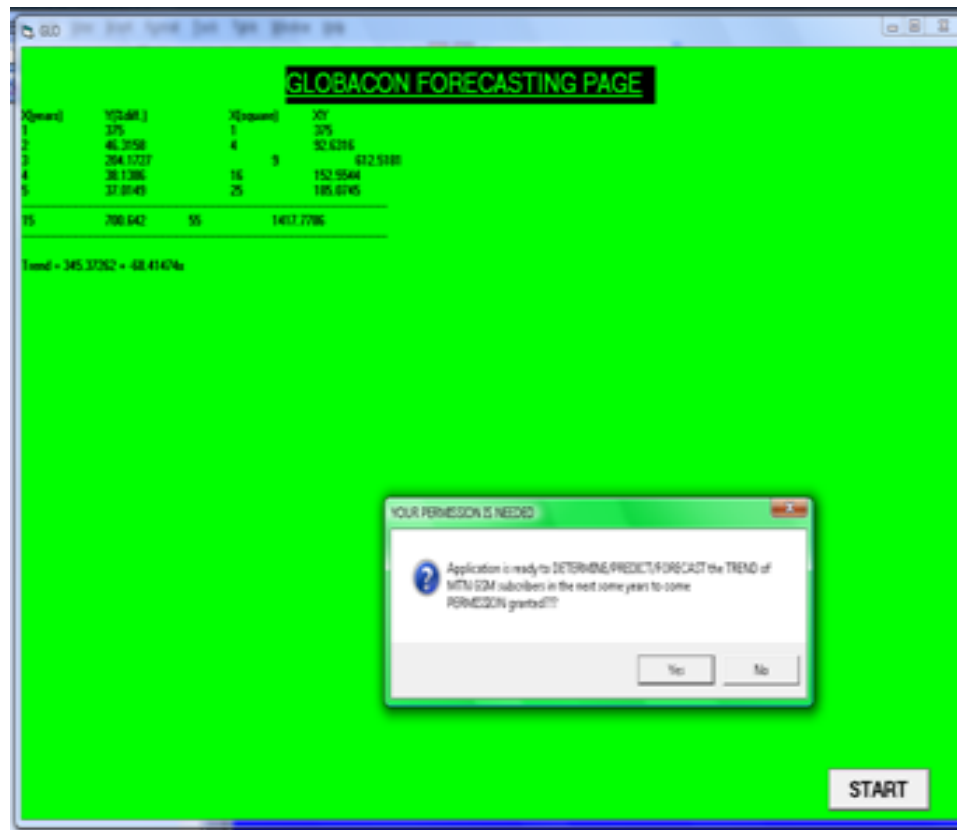
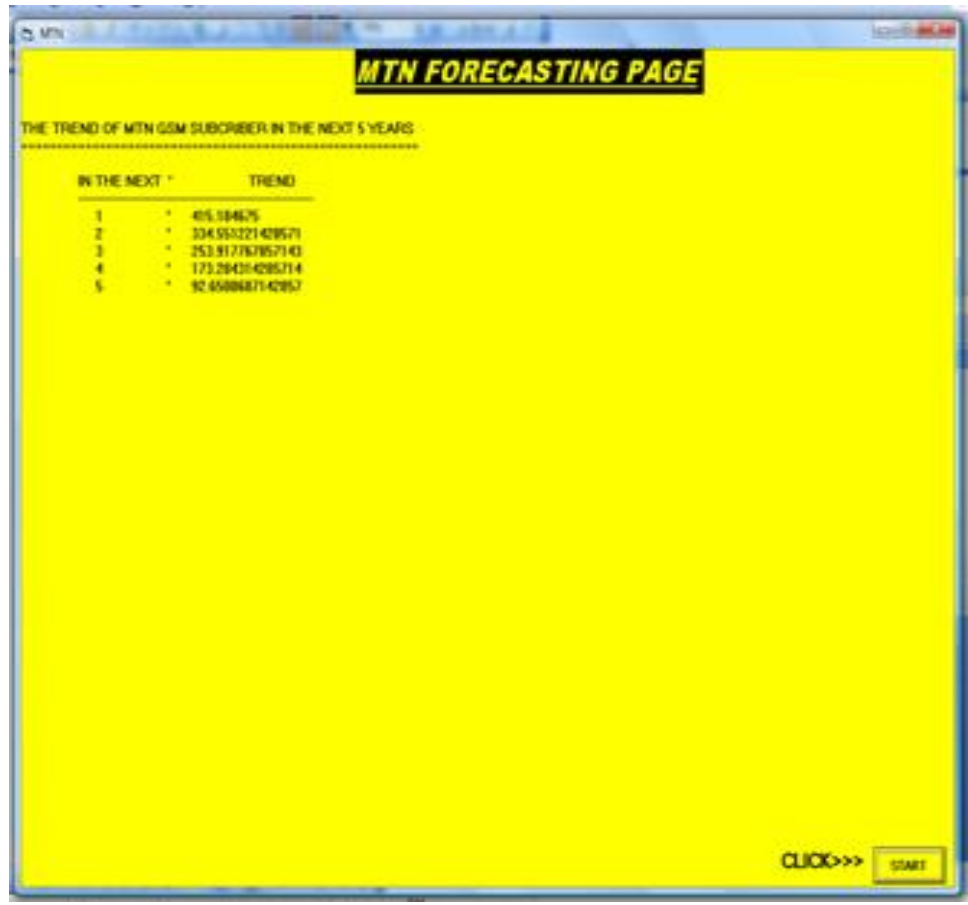
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## APPENDIX: PROGRAM OUTPUT

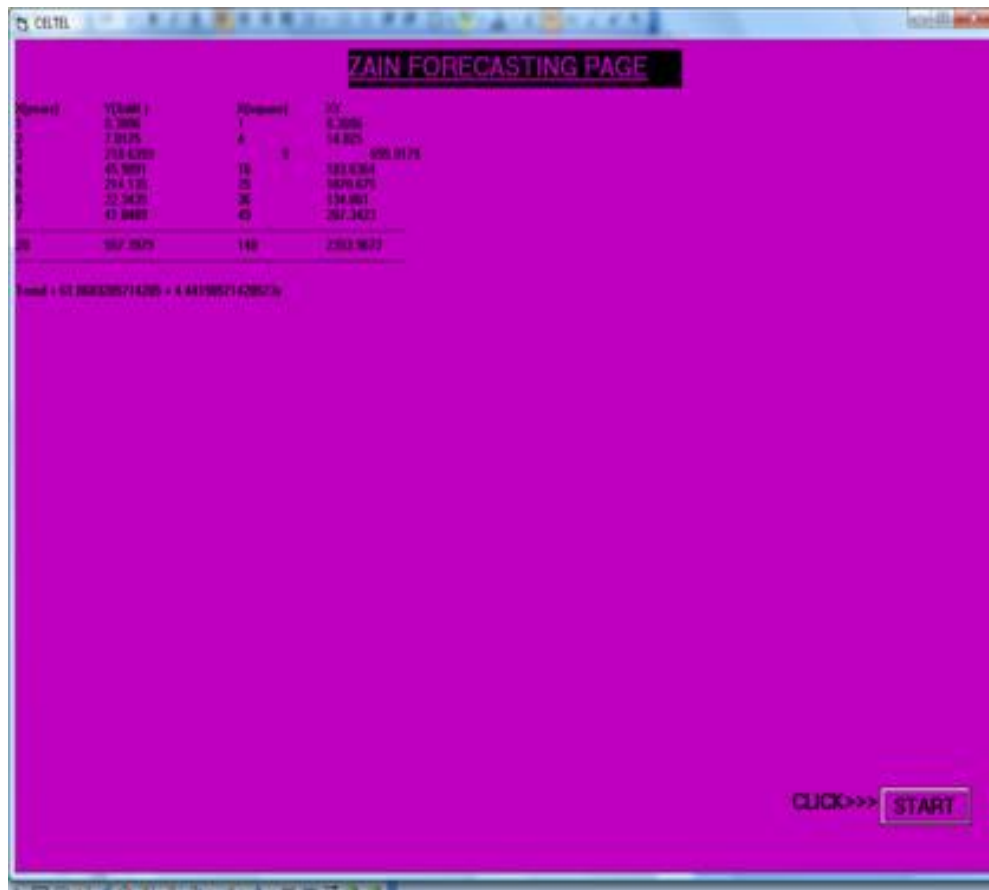
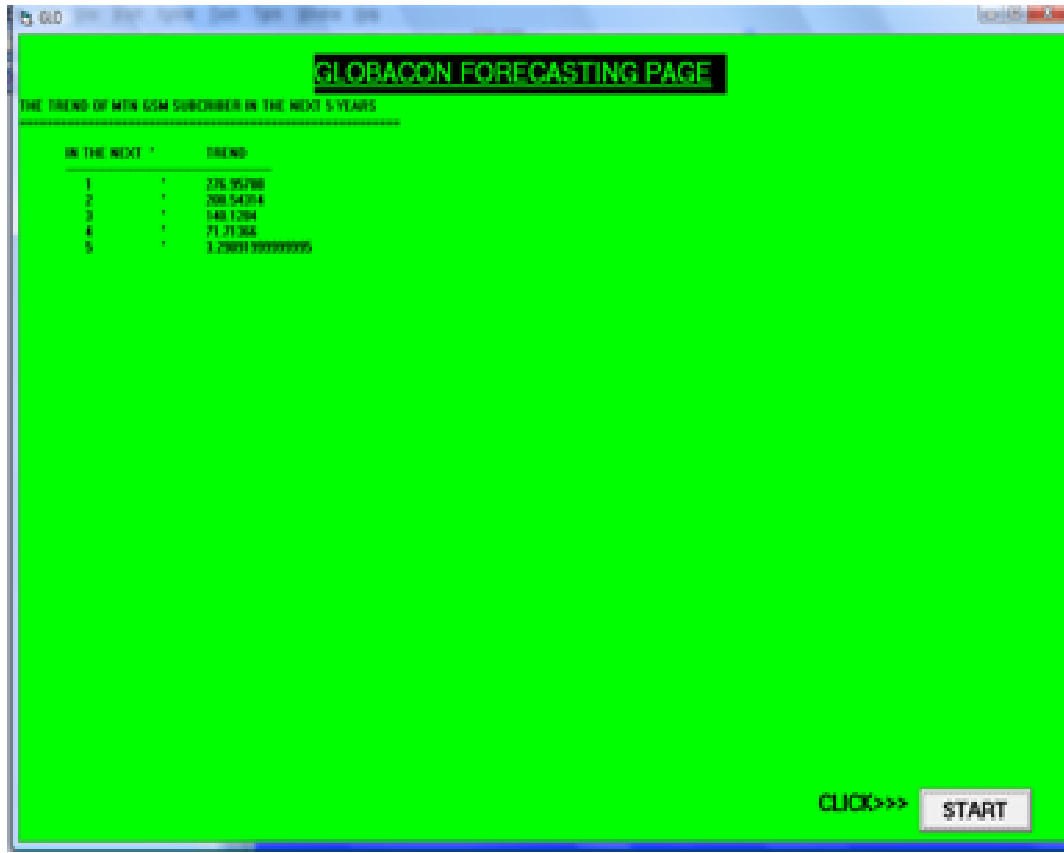








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