MULTIPLE REGRESSION

Input values: Date, Day, Volumes

Parameters:

Intercept

ParDay

ParWeek

ParMonth

ParDay Factor

ParWeek Factor

ParMonth Factor

|  |  |
| --- | --- |
|  |  |
| **MAPE** | IF(ISERROR(AVERAGE($(APE):$M$1048576)),"", AVERAGE($M$4:$M$1048576)) |
|  |
| **String Month** |  |
| VLOOKUP(C3,$AJ$2:$AK$14,2,0) |
| **Week factor** | VLOOKUP(String, Factors!$E:$I,4,0) |
| VLOOKUP(B4,Factors!$B:$G,6,0) |
| **Month Factor** | VLOOKUP(Month, Factors: (Y-Hat-MR),6,0) |
| VLOOKUP(C4,Factors!Month!D:I,6,0) |
| **Y-Mat-MR** | Intercept+( ParWeek\*Week)+(ParMonth\*Month)+( ParWeek factor\*Week Factor)+(ParMonth factor\*Month Factor) |
| =$S$4++($S$5\*B4)+($S$6\*C4)++($S$7\*E4)+($S$8\*F4) |
| **Error** | (Y-Mat-MR)-volumes |
| =H4-G4 |
| **APE** | IF(ISERROR(ABS(Error)/Volume),"",ABS(Error)/Volume) |
| IF(ISERROR(ABS(I4)/G4),"",ABS(I4)/G4) |

MAPE= =

**Week**==IF(ROUNDUP((DAY(Date)+WEEKDAY(DATE(YEAR(DATE),MONTH(DATE),0)))/7,0)=6,5,ROUNDUP((DAY(DATE)+WEEKDAY(DATE(YEAR(DATE),MONTH(DATE),0)))/7,0))

**String** =Week & Month; [=D4&C4]

**Day Factor**=VLOOKUP(Day,Factors!$B:$I,6,0) [=VLOOKUP(B4,Factors!$B:$I,6,0)]

**Week factor**=VLOOKUP(String,Factors!$E:$I,4,0) [=VLOOKUP(E4,Factors!$E:$I,4,0)]

**Month Factor** =VLOOKUP(month,Factors!D:I,6,0) [=VLOOKUP(D4,Factors!D:I,6,0)]

**Y-Mat-MR=** **=**Intercept+(Day\*ParDay)+(ParWeek\*Week)+(ParMonth\*Month)+(ParDay Factor\*Day Factor)+(ParWeek factor\*WeekFactor)+(ParMonth factor\*Month Factor)

[=$U$4+(B4\*$U$5)+($U$6\*C4)+($U$7\*D4)+($U$8\*F4)+($U$9\*G4)+($U$10\*H4)]

**Error**=(Y-Mat-MR)-volumes [=J4-I4]

**APE** =IF(ISERROR(ABS(Error)/Vol),"",ABS(Error)/Vol) [=IF(ISERROR(ABS(K4)/I4),"",ABS(K4)/I4)]

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Day** | **Week** | **Month** | **String** | **Day Factor** | **Week factor** | **Month Factor** | **Volumes** | **Y-Hat-MR** | **Error** | **Error^2** | **APE** | **String** | **Seasonal Index** | **Reseasonalized Forecast** |
| 3-Jan-12 | 3 | 2 | 1 | 12 | 1.26 | 0.82 | 1.25 | 452 | **441** | (11) | 127 | 2% |  |  |  |
| 4-Jan-12 | 4 | 2 | 1 | 12 | 1.11 | 0.82 | 1.25 | 396 | **397** | 1 | 1 | 0% |  |  |  |
| 5-Jan-12 | 5 | 2 | 1 | 12 | 0.95 | 0.82 | 1.25 | 342 | **355** | 13 | 172 | 4% |  |  |  |
| 6-Jan-12 | 6 | 2 | 1 | 12 | 0.98 | 0.82 | 1.25 | 351 | **360** | 9 | 76 | 2% |  |  |  |
| 9-Jan-12 | 9 | 3 | 1 | 13 | 1.08 | 0.98 | 1.25 | 387 | **397** | 10 | 92 | 2% |  |  |  |
| 10-Jan-12 | 10 | 3 | 1 | 13 | 1.09 | 0.98 | 1.25 | 391 | **398** | 7 | 43 | 2% |  |  |  |
| 11-Jan-12 | 11 | 3 | 1 | 13 | 1.08 | 0.98 | 1.25 | 388 | **393** | 5 | 28 | 1% |  |  |  |
| 12-Jan-12 | 12 | 3 | 1 | 13 | 1.03 | 0.98 | 1.25 | 369 | **377** | 8 | 66 | 2% |  |  |  |
| 13-Jan-12 | 13 | 3 | 1 | 13 | 0.86 | 0.98 | 1.25 | 307 | **329** | 22 | 489 | 7% |  |  |  |
| 16-Jan-12 | 16 | 4 | 1 | 14 | 0.20 | 0.86 | 1.25 | 70 | **160** | 90 | 8044 | 128% |  |  |  |
| 17-Jan-12 | 17 | 4 | 1 | 14 | 1.28 | 0.86 | 1.25 | 459 | **446** | (13) | 167 | 3% |  |  |  |
| 18-Jan-12 | 18 | 4 | 1 | 14 | 1.21 | 0.86 | 1.25 | 434 | **425** | (9) | 73 | 2% |  |  |  |
| 19-Jan-12 | 19 | 4 | 1 | 14 | 0.99 | 0.86 | 1.25 | 355 | **365** | 10 | 97 | 3% |  |  |  |
| 20-Jan-12 | 20 | 4 | 1 | 14 | 0.85 | 0.86 | 1.25 | 304 | **325** | 21 | 441 | 7% |  |  |  |
| 23-Jan-12 | 23 | 5 | 1 | 15 | 1.02 | 1.34 | 1.25 | 366 | **386** | 20 | 386 | 5% |  |  |  |
| 24-Jan-12 | 24 | 5 | 1 | 15 | 1.12 | 1.34 | 1.25 | 400 | **409** | 9 | 77 | 2% |  |  |  |
| 25-Jan-12 | 25 | 5 | 1 | 15 | 0.98 | 1.34 | 1.25 | 350 | **370** | 20 | 387 | 6% |  |  |  |
| 26-Jan-12 | 26 | 5 | 1 | 15 | 0.91 | 1.34 | 1.25 | 327 | **351** | 24 | 556 | 7% |  |  |  |
| 27-Jan-12 | 27 | 5 | 1 | 15 | 0.77 | 1.34 | 1.25 | 275 | **310** | 35 | 1224 | 13% |  |  |  |
| 30-Jan-12 | 30 | 5 | 1 | 15 | 1.12 | 1.34 | 1.25 | 400 | **397** | (3) | 12 | 1% |  |  |  |
| 31-Jan-12 | 31 | 5 | 1 | 15 | 1.12 | 1.34 | 1.25 | 402 | **396** | (6) | 36 | 2% |  |  |  |
| 1-Feb-12 | 1 | 1 | 2 | 21 | 1.09 | 0.73 | 1.15 | 360 | **359** | (1) | 2 | 0% |  |  |  |
| 2-Feb-12 | 2 | 1 | 2 | 21 | 1.10 | 0.73 | 1.15 | 361 | **357** | (4) | 13 | 1% |  |  |  |
| 3-Feb-12 | 3 | 1 | 2 | 21 | 1.26 | 0.73 | 1.15 | 288 | **400** | 112 | 12438 | 39% |  |  |  |
| 6-Feb-12 | 6 | 2 | 2 | 22 | 0.98 | 1.33 | 1.15 | 412 | **341** | (71) | 5041 | 17% |  |  |  |
| 7-Feb-12 | 7 | 2 | 2 | 22 | 1.18 | 1.33 | 1.15 | 388 | **391** | 3 | 12 | 1% |  |  |  |
| 8-Feb-12 | 8 | 2 | 2 | 22 | 1.15 | 1.33 | 1.15 | 378 | **381** | 3 | 11 | 1% |  |  |  |
| 9-Feb-12 | 9 | 2 | 2 | 22 | 1.08 | 1.33 | 1.15 | 342 | **362** | 20 | 383 | 6% |  |  |  |
| 10-Feb-12 | 10 | 2 | 2 | 22 | 1.09 | 1.33 | 1.15 | 317 | **362** | 45 | 2068 | 14% |  |  |  |
| 13-Feb-12 | 13 | 3 | 2 | 23 | 0.86 | 1.23 | 1.15 | 414 | **307** | (107) | 11484 | 26% |  |  |  |

|  |  |
| --- | --- |
| **Intercept** | **-218.11** |
| **Day** | **-2.04** |
| **Week** | **14.07** |
| **Month** | **-2.39** |
| **Day Factor** | **265.68** |
| **Week Factor** | **14.07** |
| **Month Factor** | **234.98** |

**Factors**

**Monthly Factors:**

|  |  |
| --- | --- |
| Average | =AVERAGEIF(Input Month : Volume, Month, Volume : Volume)  =AVERAGEIF($D:$F,Z3,$F:$F) |
| Total | =SUMIF(Input Month : Volume, Month, Volume : Volume)  =SUMIF($D:$F,Z3,$F:$F) |
| Factor | =Current Total/Total Average  =AB3/$AB$15 |

**Weekly Factors:**

|  |  |
| --- | --- |
| Total | =IF(SUMIF(String : Volume, Week, Volume : Volume)>0,  SUMIF(String : Volume, Week, Volume : Volume)," ")  =IF(SUMIF(E:F,AE3,$F:$F)>0,SUMIF(E:F,AE3,$F:$F),"") |
| Average | =AVERAGE(Current Total : Nth Total)  =AVERAGE(AF3:AF7) |
| Factor | =IF(ISERROR(Total/Average),0,Total/Average)  =IF(ISERROR(AF3/AG3),0,AF3/AG3) |

**Weekly Forecast:**

MULTIPLE REGRESSION

**Input values**: Date, Day, Volumes

**Parameters**: Intercept, Week, Week factor, Month, Month Factor

|  |  |
| --- | --- |
|  |  |
| **MAPE** |  |
| C4&B4 |
| **Week factor** | VLOOKUP(String, Factors!$E:$I,4,0) |
| VLOOKUP(B4,Factors!$B:$G,6,0) |
| **Month Factor** | VLOOKUP(Month, Factors: (Y-Hat-MR),6,0) |
| VLOOKUP(C4,Factors!Month!D:I,6,0) |
| **Y-Mat-MR** | Intercept+( ParWeek\*Week)+(ParMonth\*Month)+( ParWeek factor\*Week Factor)+(ParMonth factor\*Month Factor) |
| =$S$4++($S$5\*B4)+($S$6\*C4)++($S$7\*E4)+($S$8\*F4) |
| **Error** | (Y-Mat-MR)-volumes |
| =H4-G4 |
| **APE** | IF(ISERROR(ABS(Error)/Volume),"",ABS(Error)/Volume) |
| IF(ISERROR(ABS(I4)/G4),"",ABS(I4)/G4) |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Week** | **Month** | **String** | **Week factor** | **Month Factor** | **Volumes** | **Y-Hat-MR** | **Error** | **Error^2** | **APE** | **String** | **Seasonal Index** | **Reseasonalized Forecast** |
| 1-Jan-00 | 1 | 1 | 11 | 1.37 | 1.32 | 1926 | **1897** | (29) | 866 | 2% |  |  |  |
| 2-Jan-00 | 2 | 1 | 12 | 1.31 | 1.32 | 1842 | **1835** | (7) | 48 | 0% |  |  |  |
| 3-Jan-00 | 3 | 1 | 13 | 1.15 | 1.32 | 1622 | **1634** | 12 | 138 | 1% |  |  |  |
| 4-Jan-00 | 4 | 1 | 14 | 1.22 | 1.32 | 1718 | **1757** | 39 | 1539 | 2% |  |  |  |
| 5-Jan-00 | 5 | 1 | 15 | 1.31 | 1.32 | 2005 | **1911** | (94) | 8865 | 5% |  |  |  |
| 6-Jan-00 | 5 | 2 | 25 | 1.31 | 1.20 | 1682 | **1804** | 123 | 15049 | 7% |  |  |  |
| 7-Jan-00 | 6 | 2 | 26 | 1.30 | 1.20 | 1837 | **1823** | (14) | 206 | 1% |  |  |  |
| 8-Jan-00 | 7 | 2 | 27 | 1.21 | 1.20 | 1709 | **1716** | 7 | 48 | 0% |  |  |  |
| 9-Jan-00 | 8 | 2 | 28 | 0.94 | 1.20 | 1326 | **1347** | 21 | 446 | 2% |  |  |  |
| 10-Jan-00 | 9 | 2 | 29 | 1.13 | 1.20 | 1733 | **1645** | (88) | 7812 | 5% |  |  |  |
| 11-Jan-00 | 9 | 3 | 39 | 1.13 | 1.11 | 1450 | **1538** | 88 | 7710 | 6% |  |  |  |
| 12-Jan-00 | 10 | 3 | 310 | 1.17 | 1.11 | 1646 | **1618** | (28) | 759 | 2% |  |  |  |