MUKESH PATEL SCHOOL OF TECHNOLOGY MANAGEMENT AND ENGINEERING

Project Implementation

For

MOVIE RATING PREDICTION AND RECOMMENDER SYSTEM

April 2020

By-

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DECISION TREE CODE

```
/*---------------------------------------------------------
  The options statement below should be placed
  before the data step when submitting this code.
----------------------------------------------------------*/
options VALIDMEMNAME=EXTEND VALIDVARNAME=ANY;
   /*----------------------------------------
   Generated SAS Scoring Code
     Date             : 12Apr2020:09:26:16
     Locale           : en_US
     Model Type       : Decision Tree
     Interval variable: AGE
     Class variable   : RATING
     Class variable   : ACTION
     Class variable   : ADVENTURE
     Class variable   : ANIMATION
     Class variable   : CHILDREN'S
     Class variable   : COMEDY
     Class variable   : CRIME
     Class variable   : DOCUMENTARY
     Class variable   : DRAMA
     Class variable   : FANTASY
     Class variable   : FILM-NOIR
     Class variable   : HORROR
     Class variable   : MUSICAL
     Class variable   : MYSTERY
     Class variable   : ROMANCE
     Class variable   : SCI-FI
     Class variable   : THRILLER
     Class variable   : UNKNOWN
     Class variable   : WAR
     Class variable   : WESTERN
     Class variable   : OCCUPATION
     Class variable   : GENDER
     Response variable: RATING
     ----------------------------------------*/
   /*---------------------------------------------------------
   SAS Code Generated by Cloud Analytic Services for Decision Tree
     Date                  : 12 April 2020 13:26:16 UTC
     Number of Nodes       : 41
     Number of Tree Depth  : 6
     Number of Bins        : 20
     Number of Obs         : 100000
     ---------------------------------------------------------*/

   length _strfmt_ $13; drop _strfmt_;
   _strfmt_ = ' ';

   array _tlevname_3629_{5} $32 _temporary_ ( '                                1'
   '                              2'
   '                              3'
   '                              4'
   '                              5');

   array _dt_fi_3629_{5} _temporary_;

   _node_id_ =  0;
   _new_id_  = -1;
   nextnode_3629:
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if _node_id_ eq 0 then do;
      _strfmt_ = left(trim(put(DRAMA,$3.)));
      if _strfmt_ in ('no') then do;

      _new_id_ = 1;
      end;
      else if _strfmt_ in ('yes') then do;

      _new_id_ = 2;
      end;
      else do;
      _new_id_ = 1;
      end;
end;
else if _node_id_ eq 1 then do;
      _strfmt_ = left(trim(put(WAR,$3.)));
      if _strfmt_ in ('no') then do;

      _new_id_ = 3;
      end;
      else if _strfmt_ in ('yes') then do;

      _new_id_ = 4;
      end;
      else do;
      _new_id_ = 3;
      end;
end;
else if _node_id_ eq 2 then do;
      _strfmt_ = left(trim(put(OCCUPATION,$13.)));
      if _strfmt_ in ('administrator',
      'educator',
      'student',
      'other',
      'engineer',
      'programmer',
      'librarian') then do;

      _new_id_ = 5;
      end;
      else if _strfmt_ in ('retired',
      'entertainment',
      'healthcare',
      'none',
      'doctor',
      'artist',
      'writer',
      'executive',
      'technician',
      'homemaker',
      'salesman',
      'marketing',
      'scientist',
      'lawyer') then do;

      _new_id_ = 6;
      end;
      else do;
      _new_id_ = 5;
      end;
end;
else if _node_id_ eq 3 then do;
      _strfmt_ = left(trim(put('FILM-NOIR'n,$3.)));
      if _strfmt_ in ('no') then do;
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      _new_id_ = 7;
      end;
      else if _strfmt_ in ('yes') then do;

      _new_id_ = 8;
      end;
      else do;
      _new_id_ = 7;
      end;
end;
else if _node_id_ eq 4 then do;
      _strfmt_ = left(trim(put(ROMANCE,$3.)));
      if _strfmt_ in ('no') then do;

      _new_id_ = 9;
      end;
      else if _strfmt_ in ('yes') then do;

      _new_id_ = 10;
      end;
      else do;
      _new_id_ = 9;
      end;
end;
else if _node_id_ eq 5 then do;
      _strfmt_ = left(trim(put(HORROR,$3.)));
      if _strfmt_ in ('no') then do;

      _new_id_ = 11;
      end;
      else if _strfmt_ in ('yes') then do;

      _new_id_ = 12;
      end;
      else do;
      _new_id_ = 11;
      end;
end;
else if _node_id_ eq 6 then do;
      _numval_ = AGE;
      if missing(_numval_) then do;
         _numval_ = -1.7976931348623E308;
      end;
      if (_numval_ ge 26.8 and _numval_ lt 73) then do;

         _new_id_ = 13;
      end;
      else if (_numval_ ge 7 and _numval_ lt 26.8) then do;

         _new_id_ = 14;
      end;
      else if (_numval_ lt 7) then do;
         _new_id_ = 14;
      end;
      else if (_numval_ ge 73) then do;
         _new_id_ = 13;
      end;
      else do;
      _new_id_ = 13;
      end;
end;
else if _node_id_ eq 7 then do;
      _leaf_id_ = 7;
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```
      _new_id_ = -1;
      _dt_pred_lev_ = 3;
      _dt_pred_prob_ =     0.32194555968912;
      _dt_fi_3629_{1} =     0.07560131128218;
      _dt_fi_3629_{2} =     0.13383550038675;
      _dt_fi_3629_{3} =      0.2956646653652;
      _dt_fi_3629_{4} =     0.32194555968912;
      _dt_fi_3629_{5} =     0.17295296327673;
end;
else if _node_id_ eq 8 then do;
      _numval_ = AGE;
      if missing(_numval_) then do;
         _numval_ = -1.7976931348623E308;
      end;
      if (_numval_ ge 23.5 and _numval_ lt 73) then do;

         _new_id_ = 15;
      end;
      else if (_numval_ ge 7 and _numval_ lt 23.5) then do;

         _new_id_ = 16;
      end;
      else if (_numval_ lt 7) then do;
         _new_id_ = 16;
      end;
      else if (_numval_ ge 73) then do;
         _new_id_ = 15;
      end;
      else do;
      _new_id_ = 15;
      end;
end;
else if _node_id_ eq 9 then do;
      _strfmt_ = left(trim(put(ACTION,$3.)));
      if _strfmt_ in ('no') then do;

      _new_id_ = 17;
      end;
      else if _strfmt_ in ('yes') then do;

      _new_id_ = 18;
      end;
      else do;
      _new_id_ = 18;
      end;
end;
else if _node_id_ eq 10 then do;
      _strfmt_ = left(trim(put(ADVENTURE,$3.)));
      if _strfmt_ in ('no') then do;

      _new_id_ = 19;
      end;
      else if _strfmt_ in ('yes') then do;

      _new_id_ = 20;
      end;
      else do;
      _new_id_ = 20;
      end;
end;
else if _node_id_ eq 11 then do;
      _strfmt_ = left(trim(put(WAR,$3.)));
      if _strfmt_ in ('no') then do;
```

```
      _new_id_ = 21;
      end;
      else if _strfmt_ in ('yes') then do;

      _new_id_ = 22;
      end;
      else do;
      _new_id_ = 21;
      end;
end;
else if _node_id_ eq 12 then do;
      _leaf_id_ = 12;
      _new_id_ = -1;
      _dt_pred_lev_ = 2;
      _dt_pred_prob_ =     0.41780821917808;
      _dt_fi_3629_{1} =     0.07534246575342;
      _dt_fi_3629_{2} =     0.19520547945205;
      _dt_fi_3629_{3} =     0.41780821917808;
      _dt_fi_3629_{4} =     0.20890410958904;
      _dt_fi_3629_{5} =     0.10273972602739;
end;
else if _node_id_ eq 13 then do;
      _strfmt_ = left(trim(put(OCCUPATION,$13.)));
      if _strfmt_ in ('entertainment',
      'none',
      'doctor',
      'artist',
      'writer',
      'executive',
      'technician',
      'homemaker',
      'salesman',
      'marketing',
      'scientist',
      'lawyer') then do;

      _new_id_ = 23;
      end;
      else if _strfmt_ in ('retired',
      'healthcare') then do;

      _new_id_ = 24;
      end;
      else do;
      _new_id_ = 23;
      end;
end;
else if _node_id_ eq 14 then do;
      _strfmt_ = left(trim(put(OCCUPATION,$13.)));
      if _strfmt_ in ('entertainment',
      'none',
      'artist',
      'writer',
      'technician',
      'homemaker',
      'salesman',
      'marketing',
      'scientist',
      'lawyer') then do;

      _new_id_ = 25;
      end;
      else if _strfmt_ in ('healthcare',
      'executive') then do;
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```
      _new_id_ = 26;
      end;
      else do;
      _new_id_ = 25;
      end;
end;
else if _node_id_ eq 15 then do;
      _strfmt_ = left(trim(put(THRILLER,$3.)));
      if _strfmt_ in ('no') then do;

      _new_id_ = 27;
      end;
      else if _strfmt_ in ('yes') then do;

      _new_id_ = 28;
      end;
      else do;
      _new_id_ = 28;
      end;
end;
else if _node_id_ eq 16 then do;
      _strfmt_ = left(trim(put(OCCUPATION,$13.)));
      if _strfmt_ in ('entertainment',
      'administrator',
      'educator',
      'none',
      'student',
      'other',
      'executive',
      'engineer',
      'technician',
      'homemaker',
      'programmer',
      'scientist') then do;

      _new_id_ = 29;
      end;
      else if _strfmt_ in ('healthcare',
      'artist',
      'writer') then do;

      _new_id_ = 30;
      end;
      else do;
      _new_id_ = 29;
      end;
end;
else if _node_id_ eq 17 then do;
      _strfmt_ = left(trim(put(COMEDY,$3.)));
      if _strfmt_ in ('no') then do;

      _new_id_ = 31;
      end;
      else if _strfmt_ in ('yes') then do;

      _new_id_ = 32;
      end;
      else do;
      _new_id_ = 31;
      end;
end;
else if _node_id_ eq 18 then do;
      _strfmt_ = left(trim(put(COMEDY,$3.)));
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```
      if _strfmt_ in ('no') then do;

      _new_id_ = 33;
      end;
      else if _strfmt_ in ('yes') then do;

      _new_id_ = 34;
      end;
      else do;
      _new_id_ = 33;
      end;
end;
else if _node_id_ eq 19 then do;
      _leaf_id_ = 19;
      _new_id_ = -1;
      _dt_pred_lev_ = 3;
      _dt_pred_prob_ =     0.38821138211382;
      _dt_fi_3629_{1} =     0.04878048780487;
      _dt_fi_3629_{2} =     0.07723577235772;
      _dt_fi_3629_{3} =     0.22154471544715;
      _dt_fi_3629_{4} =     0.38821138211382;
      _dt_fi_3629_{5} =     0.26422764227642;
end;
else if _node_id_ eq 20 then do;
      _leaf_id_ = 20;
      _new_id_ = -1;
      _dt_pred_lev_ = 4;
      _dt_pred_prob_ =     0.44605475040257;
      _dt_fi_3629_{1} =     0.01368760064412;
      _dt_fi_3629_{2} =      0.0330112721417;
      _dt_fi_3629_{3} =     0.14492753623188;
      _dt_fi_3629_{4} =     0.36231884057971;
      _dt_fi_3629_{5} =     0.44605475040257;
end;
else if _node_id_ eq 21 then do;
      _leaf_id_ = 21;
      _new_id_ = -1;
      _dt_pred_lev_ = 3;
      _dt_pred_prob_ =      0.3759154460719;
      _dt_fi_3629_{1} =     0.03599367509986;
      _dt_fi_3629_{2} =     0.08917276964047;
      _dt_fi_3629_{3} =      0.2459637150466;
      _dt_fi_3629_{4} =      0.3759154460719;
      _dt_fi_3629_{5} =     0.25295439414114;
end;
else if _node_id_ eq 22 then do;
      _strfmt_ = left(trim(put(THRILLER,$3.)));
      if _strfmt_ in ('no') then do;

      _new_id_ = 35;
      end;
      else if _strfmt_ in ('yes') then do;

      _new_id_ = 36;
      end;
      else do;
      _new_id_ = 35;
      end;
end;
else if _node_id_ eq 23 then do;
      _leaf_id_ = 23;
      _new_id_ = -1;
      _dt_pred_lev_ = 3;
      _dt_pred_prob_ =     0.37358691315334;
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      _dt_fi_3629_{1} =     0.03870195504721;
      _dt_fi_3629_{2} =     0.09203351509509;
      _dt_fi_3629_{3} =     0.24471339273839;
      _dt_fi_3629_{4} =     0.37358691315334;
      _dt_fi_3629_{5} =     0.25096422396595;
end;
else if _node_id_ eq 24 then do;
      _strfmt_ = left(trim(put(GENDER,$1.)));
      if _strfmt_ in ('M') then do;

      _new_id_ = 37;
      end;
      else if _strfmt_ in ('F') then do;

      _new_id_ = 38;
      end;
      else do;
      _new_id_ = 37;
      end;
end;
else if _node_id_ eq 25 then do;
      _leaf_id_ = 25;
      _new_id_ = -1;
      _dt_pred_lev_ = 3;
      _dt_pred_prob_ =     0.32912007778317;
      _dt_fi_3629_{1} =     0.05250364608653;
      _dt_fi_3629_{2} =     0.11229946524064;
      _dt_fi_3629_{3} =     0.25765678172095;
      _dt_fi_3629_{4} =     0.32912007778317;
      _dt_fi_3629_{5} =     0.24842002916869;
end;
else if _node_id_ eq 26 then do;
      _strfmt_ = left(trim(put('SCI-FI'n,$3.)));
      if _strfmt_ in ('no') then do;

      _new_id_ = 39;
      end;
      else if _strfmt_ in ('yes') then do;

      _new_id_ = 40;
      end;
      else do;
      _new_id_ = 39;
      end;
end;
else if _node_id_ eq 27 then do;
      _leaf_id_ = 27;
      _new_id_ = -1;
      _dt_pred_lev_ = 4;
      _dt_pred_prob_ =     0.42395437262357;
      _dt_fi_3629_{1} =     0.00760456273764;
      _dt_fi_3629_{2} =     0.03041825095057;
      _dt_fi_3629_{3} =     0.15209125475285;
      _dt_fi_3629_{4} =     0.38593155893536;
      _dt_fi_3629_{5} =     0.42395437262357;
end;
else if _node_id_ eq 28 then do;
      _leaf_id_ = 28;
      _new_id_ = -1;
      _dt_pred_lev_ = 3;
      _dt_pred_prob_ =     0.39775561097256;
      _dt_fi_3629_{1} =     0.01246882793017;
      _dt_fi_3629_{2} =      0.0573566084788;
      _dt_fi_3629_{3} =     0.22568578553615;
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      _dt_fi_3629_{4} =     0.39775561097256;
      _dt_fi_3629_{5} =     0.30673316708229;
end;
else if _node_id_ eq 29 then do;
      _leaf_id_ = 29;
      _new_id_ = -1;
      _dt_pred_lev_ = 3;
      _dt_pred_prob_ =     0.38288288288288;
      _dt_fi_3629_{1} =     0.02252252252252;
      _dt_fi_3629_{2} =     0.04504504504504;
      _dt_fi_3629_{3} =     0.23423423423423;
      _dt_fi_3629_{4} =     0.38288288288288;
      _dt_fi_3629_{5} =     0.31531531531531;
end;
else if _node_id_ eq 30 then do;
      _leaf_id_ = 30;
      _new_id_ = -1;
      _dt_pred_lev_ = 0;
      _dt_pred_prob_ =     0.52380952380952;
      _dt_fi_3629_{1} =     0.52380952380952;
      _dt_fi_3629_{2} =     0.09523809523809;
      _dt_fi_3629_{3} =     0.14285714285714;
      _dt_fi_3629_{4} =     0.09523809523809;
      _dt_fi_3629_{5} =     0.14285714285714;
end;
else if _node_id_ eq 31 then do;
      _leaf_id_ = 31;
      _new_id_ = -1;
      _dt_pred_lev_ = 4;
      _dt_pred_prob_ =     0.42006802721088;
      _dt_fi_3629_{1} =     0.02210884353741;
      _dt_fi_3629_{2} =     0.05102040816326;
      _dt_fi_3629_{3} =     0.16666666666666;
      _dt_fi_3629_{4} =     0.34013605442176;
      _dt_fi_3629_{5} =     0.42006802721088;
end;
else if _node_id_ eq 32 then do;
      _leaf_id_ = 32;
      _new_id_ = -1;
      _dt_pred_lev_ = 3;
      _dt_pred_prob_ =      0.3596837944664;
      _dt_fi_3629_{1} =     0.09288537549407;
      _dt_fi_3629_{2} =     0.09881422924901;
      _dt_fi_3629_{3} =     0.23122529644268;
      _dt_fi_3629_{4} =      0.3596837944664;
      _dt_fi_3629_{5} =     0.21739130434782;
end;
else if _node_id_ eq 33 then do;
      _leaf_id_ = 33;
      _new_id_ = -1;
      _dt_pred_lev_ = 3;
      _dt_pred_prob_ =     0.36172161172161;
      _dt_fi_3629_{1} =     0.05494505494505;
      _dt_fi_3629_{2} =     0.13827838827838;
      _dt_fi_3629_{3} =      0.2554945054945;
      _dt_fi_3629_{4} =     0.36172161172161;
      _dt_fi_3629_{5} =     0.18956043956043;
end;
else if _node_id_ eq 34 then do;
      _leaf_id_ = 34;
      _new_id_ = -1;
      _dt_pred_lev_ = 2;
      _dt_pred_prob_ =     0.36392405063291;
      _dt_fi_3629_{1} =     0.15189873417721;
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      _dt_fi_3629_{2} =     0.22784810126582;
      _dt_fi_3629_{3} =     0.36392405063291;
      _dt_fi_3629_{4} =     0.18354430379746;
      _dt_fi_3629_{5} =     0.07278481012658;
end;
else if _node_id_ eq 35 then do;
      _leaf_id_ = 35;
      _new_id_ = -1;
      _dt_pred_lev_ = 3;
      _dt_pred_prob_ =     0.36457717327025;
      _dt_fi_3629_{1} =     0.02690715552927;
      _dt_fi_3629_{2} =     0.06002365464222;
      _dt_fi_3629_{3} =     0.19899467770549;
      _dt_fi_3629_{4} =     0.36457717327025;
      _dt_fi_3629_{5} =     0.34949733885274;
end;
else if _node_id_ eq 36 then do;
      _leaf_id_ = 36;
      _new_id_ = -1;
      _dt_pred_lev_ = 2;
      _dt_pred_prob_ =     0.38805970149253;
      _dt_fi_3629_{1} =     0.05223880597014;
      _dt_fi_3629_{2} =     0.12686567164179;
      _dt_fi_3629_{3} =     0.38805970149253;
      _dt_fi_3629_{4} =     0.35447761194029;
      _dt_fi_3629_{5} =     0.07835820895522;
end;
else if _node_id_ eq 37 then do;
      _leaf_id_ = 37;
      _new_id_ = -1;
      _dt_pred_lev_ = 3;
      _dt_pred_prob_ =     0.44884488448844;
      _dt_fi_3629_{1} =     0.02420242024202;
      _dt_fi_3629_{2} =      0.1023102310231;
      _dt_fi_3629_{3} =     0.28712871287128;
      _dt_fi_3629_{4} =     0.44884488448844;
      _dt_fi_3629_{5} =     0.13751375137513;
end;
else if _node_id_ eq 38 then do;
      _leaf_id_ = 38;
      _new_id_ = -1;
      _dt_pred_lev_ = 2;
      _dt_pred_prob_ =     0.45953002610966;
      _dt_fi_3629_{1} =     0.02480417754569;
      _dt_fi_3629_{2} =     0.15665796344647;
      _dt_fi_3629_{3} =     0.45953002610966;
      _dt_fi_3629_{4} =     0.27937336814621;
      _dt_fi_3629_{5} =     0.07963446475195;
end;
else if _node_id_ eq 39 then do;
      _leaf_id_ = 39;
      _new_id_ = -1;
      _dt_pred_lev_ = 0;
      _dt_pred_prob_ =     0.51869158878504;
      _dt_fi_3629_{1} =     0.51869158878504;
      _dt_fi_3629_{2} =     0.11370716510903;
      _dt_fi_3629_{3} =     0.12305295950155;
      _dt_fi_3629_{4} =     0.10280373831775;
      _dt_fi_3629_{5} =      0.1417445482866;
end;
else if _node_id_ eq 40 then do;
      _leaf_id_ = 40;
      _new_id_ = -1;
      _dt_pred_lev_ = 3;
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         _dt_pred_prob_ =     0.39285714285714;
         _dt_fi_3629_{1} =     0.03571428571428;
         _dt_fi_3629_{2} =     0.03571428571428;
         _dt_fi_3629_{3} =     0.17857142857142;
         _dt_fi_3629_{4} =     0.39285714285714;
         _dt_fi_3629_{5} =     0.35714285714285;
   end;
   if _new_id_ >= 0 then do;
       _node_id_ = _new_id_;
      goto nextnode_3629;
   end;

   I_RATING = _tlevname_3629_{_dt_pred_lev_+1};
   _i_ = 1;
   _dt_predp_ = _dt_fi_3629_{_i_};
   P_RATING1 = _dt_predp_;
   _i_+1;
   _dt_predp_ = _dt_fi_3629_{_i_};
   P_RATING2 = _dt_predp_;
   _i_+1;
   _dt_predp_ = _dt_fi_3629_{_i_};
   P_RATING3 = _dt_predp_;
   _i_+1;
   _dt_predp_ = _dt_fi_3629_{_i_};
   P_RATING4 = _dt_predp_;
   _i_+1;
   _dt_predp_ = _dt_fi_3629_{_i_};
   P_RATING5 = _dt_predp_;
   _i_+1;
   drop _dt_predp_;
   drop _i_;
   drop _dt_pred_lev_;
   drop _dt_pred_prob_;
   drop _numval_;
   drop _node_id_;
   drop _new_id_;
   /*-----------------------------------------*/
   drop 'I_RATING'n '_leaf_id_'n 'P_RATING1'n 'P_RATING2'n 'P_RATING3'n 'P_RATING4'n
'P_RATING5'n;
length 'I_RATING_3629_2'n $32;
      'I_RATING_3629_2'n='I_RATING'n;
'P_RATING1_3629_2'n='P_RATING1'n;
'P_RATING2_3629_2'n='P_RATING2'n;
'P_RATING3_3629_2'n='P_RATING3'n;
'P_RATING4_3629_2'n='P_RATING4'n;
'P_RATING5_3629_2'n='P_RATING5'n;
'_leaf_id__3629_2'n='_leaf_id_'n;
   /*-----------------------------------------*/
```

LOGISTIC REGRESSION CODE

```
/*-----------------------------------------------------------
  The options statement below should be placed
  before the data step when submitting this code.
```

```
------------------------------------------------------------*/
options VALIDMEMNAME=EXTEND VALIDVARNAME=ANY;
   /*----------------------------------------
   Generated SAS Scoring Code
     Date             : 12Apr2020:09:28:38
     Locale           : en_US
     Model Type       : Logistic Regression
     Class variable   : _va_d__E_RATING(RATING)
     Class variable   : ACTION
     Class variable   : ADVENTURE
     Class variable   : ANIMATION
     Class variable   : CHILDREN'S
     Class variable   : COMEDY
     Class variable   : CRIME
     Class variable   : DOCUMENTARY
     Class variable   : DRAMA
     Class variable   : FANTASY
     Class variable   : FILM-NOIR
     Class variable   : GENDER
     Class variable   : HORROR
     Class variable   : MUSICAL
     Class variable   : MYSTERY
     Class variable   : ROMANCE
     Class variable   : SCI-FI
     Class variable   : THRILLER
     Class variable   : UNKNOWN
     Class variable   : WAR
     Class variable   : WESTERN
     Response variable: _va_d__E_RATING(RATING)
     Distribution     : Binary
     Link Function    : Logit
     ----------------------------------------*/
/* Temporary Computed Columns */
if (('RATING'n = 5.0))then do;
'_va_d__E_RATING'n= 1.0;
end;
else do;
'_va_d__E_RATING'n= 0.0;
end;
;

/*----------------------------------------*/
   /*------------------------------------------------------------
     Generated SAS Scoring Code
     Date: 12 April 2020 09:28:38
     ------------------------------------------------------------*/

   /*------------------------------------------------------------
   Defining temporary arrays and variables
     ------------------------------------------------------------*/
   drop _badval_ _linp_ _temp_ _i_ _j_;
   _badval_ = 0;
   _linp_   = 0;
   _temp_   = 0;
   _i_      = 0;
   _j_      = 0;
   drop MACLOGBIG;
   MACLOGBIG= 7.0978271289338392e+02;

   array _xrow_6850_0_{37} _temporary_;
   array _beta_6850_0_{37} _temporary_ (    0.86259800639916
            0.1692184538145
                           0
          -0.15634811137558
```

```
                        0
         -0.5385587930682
                        0
          0.36848288245024
                        0
          0.12674489436633
                        0
         -0.20455966133041
                        0
         -0.51677082628767
                        0
         -0.33772311272979
                        0
          0.41081618107591
                        0
         -0.59347460486319
                        0
          0.16067093710548
                        0
          0.12234647176636
                        0
         -0.13370810868264
                        0
         -0.13924421050187
                        0
         -0.14642476557121
                        0
         -0.19285653771382
                        0
         -0.50225277464582
                        0
         -0.18653909808621
                        0);

length _WAR_ $3; drop _WAR_;
_WAR_ = left(trim(put(WAR,$3.)));
length _WESTERN_ $3; drop _WESTERN_;
_WESTERN_ = left(trim(put(WESTERN,$3.)));
length _ROMANCE_ $3; drop _ROMANCE_;
_ROMANCE_ = left(trim(put(ROMANCE,$3.)));
length _MUSICAL_ $3; drop _MUSICAL_;
_MUSICAL_ = left(trim(put(MUSICAL,$3.)));
length _DRAMA_ $3; drop _DRAMA_;
_DRAMA_ = left(trim(put(DRAMA,$3.)));
length '_CHILDREN''S_'n $3; drop '_CHILDREN''S_'n;
'_CHILDREN''S_'n = left(trim(put('CHILDREN''S'n,$3.)));
length '_SCI-FI_'n $3; drop '_SCI-FI_'n;
'_SCI-FI_'n = left(trim(put('SCI-FI'n,$3.)));
length _DOCUMENTARY_ $3; drop _DOCUMENTARY_;
_DOCUMENTARY_ = left(trim(put(DOCUMENTARY,$3.)));
length _COMEDY_ $3; drop _COMEDY_;
_COMEDY_ = left(trim(put(COMEDY,$3.)));
length _GENDER_ $1; drop _GENDER_;
_GENDER_ = left(trim(put(GENDER,$1.)));
length _ADVENTURE_ $3; drop _ADVENTURE_;
_ADVENTURE_ = left(trim(put(ADVENTURE,$3.)));
length _ANIMATION_ $3; drop _ANIMATION_;
_ANIMATION_ = left(trim(put(ANIMATION,$3.)));
length _HORROR_ $3; drop _HORROR_;
_HORROR_ = left(trim(put(HORROR,$3.)));
length _FANTASY_ $3; drop _FANTASY_;
_FANTASY_ = left(trim(put(FANTASY,$3.)));
length _ACTION_ $3; drop _ACTION_;
_ACTION_ = left(trim(put(ACTION,$3.)));
```

```
length _CRIME_ $3; drop _CRIME_;
_CRIME_ = left(trim(put(CRIME,$3.)));
length _MYSTERY_ $3; drop _MYSTERY_;
_MYSTERY_ = left(trim(put(MYSTERY,$3.)));
length '_FILM-NOIR_'n $3; drop '_FILM-NOIR_'n;
'_FILM-NOIR_'n = left(trim(put('FILM-NOIR'n,$3.)));
do _i_=1 to 37; _xrow_6850_0_{_i_} = 0; end;

_xrow_6850_0_[1] = 1;

_temp_ = 1;
select (_ACTION_);
   when ('no') _xrow_6850_0_[2] = _temp_;
   when ('yes') _xrow_6850_0_[3] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;

_temp_ = 1;
select (_ADVENTURE_);
   when ('no') _xrow_6850_0_[4] = _temp_;
   when ('yes') _xrow_6850_0_[5] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;

_temp_ = 1;
select (_ANIMATION_);
   when ('no') _xrow_6850_0_[6] = _temp_;
   when ('yes') _xrow_6850_0_[7] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;

_temp_ = 1;
select ('_CHILDREN''S_'n);
   when ('no') _xrow_6850_0_[8] = _temp_;
   when ('yes') _xrow_6850_0_[9] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;

_temp_ = 1;
select (_COMEDY_);
   when ('no') _xrow_6850_0_[10] = _temp_;
   when ('yes') _xrow_6850_0_[11] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;

_temp_ = 1;
select (_CRIME_);
   when ('no') _xrow_6850_0_[12] = _temp_;
   when ('yes') _xrow_6850_0_[13] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;

_temp_ = 1;
select (_DOCUMENTARY_);
   when ('no') _xrow_6850_0_[14] = _temp_;
   when ('yes') _xrow_6850_0_[15] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;

_temp_ = 1;
select (_DRAMA_);
   when ('no') _xrow_6850_0_[16] = _temp_;
   when ('yes') _xrow_6850_0_[17] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
```

```
end;

_temp_ = 1;
select (_FANTASY_);
   when ('no') _xrow_6850_0_[18] = _temp_;
   when ('yes') _xrow_6850_0_[19] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;

_temp_ = 1;
select ('_FILM-NOIR_'n);
   when ('no') _xrow_6850_0_[20] = _temp_;
   when ('yes') _xrow_6850_0_[21] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;

_temp_ = 1;
select (_GENDER_);
   when ('F') _xrow_6850_0_[22] = _temp_;
   when ('M') _xrow_6850_0_[23] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;

_temp_ = 1;
select (_HORROR_);
   when ('no') _xrow_6850_0_[24] = _temp_;
   when ('yes') _xrow_6850_0_[25] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;

_temp_ = 1;
select (_MUSICAL_);
   when ('no') _xrow_6850_0_[26] = _temp_;
   when ('yes') _xrow_6850_0_[27] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;

_temp_ = 1;
select (_MYSTERY_);
   when ('no') _xrow_6850_0_[28] = _temp_;
   when ('yes') _xrow_6850_0_[29] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;

_temp_ = 1;
select (_ROMANCE_);
   when ('no') _xrow_6850_0_[30] = _temp_;
   when ('yes') _xrow_6850_0_[31] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;

_temp_ = 1;
select ('_SCI-FI_'n);
   when ('no') _xrow_6850_0_[32] = _temp_;
   when ('yes') _xrow_6850_0_[33] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;

_temp_ = 1;
select (_WAR_);
   when ('no') _xrow_6850_0_[34] = _temp_;
   when ('yes') _xrow_6850_0_[35] = _temp_;
   otherwise do; _badval_ = 1; goto skip_6850_0; end;
end;
```

```
   _temp_ = 1;
   select (_WESTERN_);
      when ('no') _xrow_6850_0_[36] = _temp_;
      when ('yes') _xrow_6850_0_[37] = _temp_;
      otherwise do; _badval_ = 1; goto skip_6850_0; end;
   end;

   do _i_=1 to 37;
      _linp_ + _xrow_6850_0_{_i_} * _beta_6850_0_{_i_};
   end;

   skip_6850_0:
   length I__va_d__E_RATING $1;
   label I__va_d__E_RATING = 'Into: _va_d__E_RATING';
   array _levels_6850_{2} $ 1 _TEMPORARY_ ('1'
   ,'0'
   );
   label P__va_d__E_RATING1 = 'Predicted: _va_d__E_RATING=1';
   if (_badval_ eq 0) and not missing(_linp_) then do;
      if (_linp_ > 0) then do;
         P__va_d__E_RATING1 = 1 / (1+exp(-_linp_));
      end; else do;
         P__va_d__E_RATING1 = exp(_linp_) / (1+exp(_linp_));
      end;
      P__va_d__E_RATING0 = 1 - P__va_d__E_RATING1;
      if P__va_d__E_RATING1 >= 0.5                  then do;
         I__va_d__E_RATING = _levels_6850_{1};
      end; else do;
         I__va_d__E_RATING = _levels_6850_{2};
      end;
   end; else do;
      _linp_ = .;
      P__va_d__E_RATING1 = .;
      P__va_d__E_RATING0 = .;
      I__va_d__E_RATING = ' ';
   end;
   /*-----------------------------------------*/
   drop '_va_d__E_RATING'n 'I__va_d__E_RATING'n 'P__va_d__E_RATING1'n
'P__va_d__E_RATING0'n;
length 'I__va_d__E_RATING_6850'n $32;
     'I__va_d__E_RATING_6850'n='I__va_d__E_RATING'n;
'P__va_d__E_RATING1_6850'n='P__va_d__E_RATING1'n;
'P__va_d__E_RATING0_6850'n='P__va_d__E_RATING0'n;
   /*-----------------------------------------*/
```