Subject: Legendre Polynomials
Posted by ganga on Thu, 29 Dec 1994 23:27:08 GMT
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Hello,

Does anyone know where I might find IDL code for calculating Legendre
Polynomials?

Thanks,

Ken

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Subject: Re: Legendre Polynomials
Posted by thompson on Thu, 29 Dec 1994 23:58:13 GMT
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ganga@physics23 (Ken Ganga) writes:

> Does anyone know where I might find IDL code for calculating Legendre
> Polynomials?

I wrote the following routine some years ago. I can't guarantee that it works,
or that it's even what you want. It's been a long time since I used it.

Sorry that it's undocumented. I've learned better since then. The technique
may be based on Abromowitz and Stegun--I tended to get that sort of thing from
there in those days.

Bill Thompson

```
 ================================================================
==================
 FUNCTION LEGENDRE,X,L,M
;
 IF N_PARAMS(0) LT 2 THEN BEGIN
  PRINT,'*** LEGENDRE must be called with 2-3 parameters:'
  PRINT,'               X, L  [, M ]'
```

```
  RETURN,X
 END ELSE IF N_PARAMS(0) EQ 2 THEN M = 0
;
 IF M LT 0 THEN BEGIN
  PRINT,'*** M must not be less than 0, routine LEGENDRE.'
  RETURN,X
 END ELSE IF M GT L THEN BEGIN
  PRINT,'*** M must not be greater than L, routine LEGENDRE.'
  RETURN,X
 END ELSE BEGIN
  S = SIZE(X)
  IF S(0) EQ 0 THEN TEST = ABS(X) ELSE TEST = MAX(ABS(X))
  IF TEST GT 1 THEN BEGIN
   PRINT,'*** X must be in the range -1 to 1, routine LEGENDRE.'
   RETURN,X
  ENDIF
 ENDELSE
;
 PMM = 0.*X + 1.
 IF M GT 0 THEN BEGIN
  SOMX2 = SQRT( (1. - X) * (1. + X) )
  FACT = 1.
  FOR I = 1,M DO BEGIN
   PMM = -PMM*FACT*SOMX2
   FACT = FACT + 2.
  ENDFOR
 ENDIF
;
 IF L EQ M THEN PLGNDR = PMM ELSE BEGIN
  PMMP1 = X * (2*M + 1) * PMM
  IF L EQ M+1 THEN PLGNDR = PMMP1 ELSE BEGIN
   FOR LL = M+2,L DO BEGIN
    PLL = (X*(2*LL-1)*PMMP1 - (LL+M-1)*PMM) / (LL-M)
    PMM = PMMP1
    PMMP1 = PLL
   ENDFOR
   PLGNDR = PLL
  ENDELSE
 ENDELSE
;
 RETURN,PLGNDR
 END
```