```
1:
2: ****************************************
3: ./exercise1/internal1.f90
4:
5: PROGRAM internal1
6: ! **** Example of a Program with an internal subroutine
7:
8:   IMPLICIT NONE
9:
10:   REAL :: a,b,c
11:
12:   CALL calc
13:   PRINT '("Answer = ",f10.4)',c
14:
15: CONTAINS
16:
17:   SUBROUTINE calc
18:     PRINT*,"Enter number one"
19:     READ*,a
20:     PRINT*,"Enter number two"
21:     READ*,b
22:     c=SQRT(a**2+b**2)
23:   END SUBROUTINE calc
24:
25: END PROGRAM internal1
26: ****************************************
27:
28:
29: ****************************************
30: ./exercise6/assume.f90
31:
32: PROGRAM assume
33: ! *** Example Program to demonstrate assumed shape arrays
34:
35:   IMPLICIT NONE
36:
37:   INTEGER :: i,j
38:   INTEGER, PARAMETER :: m=5,n=6
39:   REAL, DIMENSION(m,n) :: array
40:   REAL :: ans
41:
42:   DO i=1,m ! *** Assign the array elements a value
43:     DO j=1,n
44:       array(i,j)=i+j
45:     ENDDO
46:   ENDDO
47:
48:   ans=sumarr(array,m,n)
49:
50:   PRINT '("Summation of all elements = ",f10.4)',ans
51:
52: CONTAINS
53:
54:   FUNCTION sumarr(aa,k,p)
55:
56:     REAL, INTENT(IN), DIMENSION(:,:) :: aa ! *** Dummy variable
57:     INTEGER, INTENT(IN) :: k,p             ! *** Dummy variables
58:     REAL :: sumarr
59:
60:     sumarr=0  ! *** Set initially to be zero
61:     DO i=1,k
62:       DO j=1,p
63:         sumarr=sumarr+aa(i,j)
64:       ENDDO
65:     ENDDO
66:
67:   END FUNCTION sumarr
```



```
68:
69: END PROGRAM assume
70: ****************************************
71:
72:
73: ****************************************
74: ./exercise3/internal3.f90
75:
76: PROGRAM internal3
77: ! **
78: ! ** Demonstrate some aspects of scope
79: ! **
80:
81:   IMPLICIT NONE
82:
83:   REAL :: a,b,c ! *** Declare Local a,b,c to main program unit
84:
85:   PRINT*,"Enter number one"
86:   READ*,a
87:   PRINT*,"Enter number two"
88:   READ*,b
89:
90:   CALL calc(a,b,c)
91:
92:   PRINT '(/,"IN MAIN PROGRAM","  a =",f5.2,"  b =",f5.2,"  c=",f5.2)',a,b,c
93:
94: CONTAINS
95:
96:   SUBROUTINE calc(d,e,f)
97:
98:     REAL :: d,e,f ! *** Dummy variables
99:     REAL :: a,b,c ! *** Declare a,b,c local to subroutine
100:
101:     f=SQRT(d**2+e**2)
102:     a=d/2 ; b=e/2 ; c=f/2
103:     PRINT '(/,"IN SUBROUTINE  ","  a =",f5.2,"  b =",f5.2,"  c=",f5.2)',a,b,c
104:
105:   END SUBROUTINE calc
106:
107: END PROGRAM internal3
108: ****************************************
109:
110:
111: ****************************************
112: ./exercise2/internal2.f90
113:
114: PROGRAM internal2
115: ! **** Example of a Program with an internal subroutine
116:
117:   IMPLICIT NONE
118:
119:   REAL :: a,b,c
120:
121:   CALL calc(a,b,c)
122:   PRINT '("Answer = ",f10.4)',c
123:
124: CONTAINS
125:
126:   SUBROUTINE calc(a,b,c)
127:     REAL :: a,b,c !*** Dummy variable declaration
128:
129:     PRINT*,"Enter number one"
130:     READ*,a
131:     PRINT*,"Enter number two"
132:     READ*,b
133:     c=SQRT(a**2+b**2)
134:   END SUBROUTINE calc
```

```
135:
136: END PROGRAM internal2
137: ****************************************
138:
139:
140: ****************************************
141: ./exercise5/internal5.f90
142:
143: PROGRAM internal5
144: ! *** Program to demonstrate a function
145:   IMPLICIT NONE
146:
147:   REAL :: a,b,c ! *** Declare a,b,c
148:
149:   PRINT*,"Enter number one"
150:   READ*,a
151:   PRINT*,"Enter number two"
152:   READ*,b
153:
154:   c=calc(a,b)
155:
156:   PRINT '("Answer = ",f10.4)',c
157:
158: CONTAINS
159:
160:   FUNCTION calc(d,e)
161:
162:     REAL :: d,e   ! *** Dummy variables
163:     REAL :: calc  ! *** Local Variables
164:
165:     calc=SQRT(d**2+e**2)
166:
167:   END FUNCTION calc
168:
169: END PROGRAM internal5
170: ****************************************
171:
172:
173: ****************************************
174: ./exercise4/internal4.f90
175:
176: PROGRAM internal4
177:
178:   IMPLICIT NONE
179:
180:   REAL :: a,b,c ! *** Declare a,b,c=0
181:
182:   PRINT*,"Enter number one"
183:   READ*,a
184:   PRINT*,"Enter number two"
185:   READ*,b
186:
187:   CALL calc(a,b,c)
188:
189:   PRINT '(/,"IN MAIN PROGRAM","  a =",f5.2,"  b =",f5.2,"  c=",f5.2)',a,b,c
190:
191: CONTAINS
192:
193:   SUBROUTINE calc(d,e,f)
194:
195:     REAL :: d,e,f ! *** Dummy variables
196:
197:     f=SQRT(d**2+e**2)
198:     PRINT '(/,"[1] IN SUBROUTINE "," a =",f5.2," b =",f5.2," c=",f5.2)',a,b,c
199:     a=d/2 ; b=e/2 ; c=f/2
200:     PRINT '(/,"[2] IN SUBROUTINE "," a =",f5.2," b =",f5.2," c=",f5.2)',a,b,c
201:
```



```
202:   END SUBROUTINE calc
203:
204: END PROGRAM internal4
205: ****************************************
206:
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