

## Problem 1

*rigidframe()*

### Rigid Frame Program

#### Coordinates

X-Axis	Y-Axis	Z-Axis
20	20	0
70	20	0
20	70	0
70	70	0
70	120	0
120	120	0

70

*Done*

[]

rigidframe
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---

Define **rigidframe()**=

Prgm

```
heading_str:="Rigid Frame Program"
```

Disp heading\_str

3

Disp " \_\_\_\_\_ "

Disp "	Coordinates"
--------	--------------

Disp "	X-Axis	Y-Axis	Z-Axis"
--------	--------	--------	---------

For  $c, 1, \dim(n\_num), 1$

```
Disp "      ",string(n_x[c]),"      ",string(n_y[c]),"      ",string(n_z[c])
```

EndFor

$$\text{augment}(\text{list} \blacktriangleright \text{mat}(n\_x, 1), \text{list} \blacktriangleright \text{mat}(n\_x, 1)) \rightarrow a$$
Disp  $a[2,2]$ 

EndPrgm

	A	mat_n...	B	matna...	C	density	D	young...	E	shear...	F	G
1		1	ST_1020...		0.283	29000000	10000000					
2		2	ST_4140...		0.283	29000000	11000000					
3		3	AL_2024...		0.1	10500000	4000000					
4		4	S_Steel		0.28	30000000	10000000					
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												

	A n_num	B n_x	C n_y	D n_z	E nr_xt	F nr_xr	G nr_yt
1	1	20	20	0	1	—	—
2	2	70	20	0	1	1	1
3	3	20	70	0	1	1	1
4	4	70	70	0	1	1	1
5	5	70	120	0	1	1	1
6	6	120	120	0	1	1	1
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							



	A m_num	B m_begin	C m_end	D m_mat	E m_area	F m_iy	G m_iz
1	1	3	1				
2	2	1	2				
3	3	2	4				
4	4	3	4				
5	5	3	2				
6	6	3	5				
7	7	4	5				
8	8	5	6				
9	9	4	6				
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							



```
str_center
```

```
Define LibPriv str_center(fieldwidth,strvar)=
```

```
Func
```

```
Local ls,lb,le,str,strb,stre,counter
```

```
str:= ""
```

```
strb:= ""
```

```
stre:= ""
```

```
ls:=dim(strvar)
```

```
lb:=int( $\frac{\text{fieldwidth}-\text{ls}}{2}$ )
```

```
le:=fieldwidth-lb-ls
```

```
[]
```

```
For counter,1,lb
```

```
  strb:=strb&" "
```

```
EndFor
```

```
[]
```

```
For counter,1,le
```

```
  stre:=stre&" "
```

```
EndFor
```

```
[]
```

```
str:=strb&strvar&stre
```

```
EndFunc
```



```
* str_fill
```

```
Define LibPriv str_fill(strvar,numchars)=
```

```
Func
```

```
  Local center, string
```

```
  string:= ""
```

```
  []
```

```
  For countcr,1,numchars
```

```
    string:=string&strvar
```

```
  EndFor
```

```
EndFunc
```

```
str_right
```

```
Define LibPriv str_right(fieldwidth, strvar, spcright)=
```

```
Func
```

```
Local ls, lb, le, str, strb, stre, counter
```

```
str:= ""
```

```
strb:= ""
```

```
stre:= ""
```

```
ls:=dim(strvar)
```

```
le:=spcright
```

```
lb:=fieldwidth-ls-le
```

```
[]
```

```
For counter, 1, lb
```

```
    strb:=strb&" "
```

```
EndFor
```

```
[]
```

```
For counter, 1, le
```

```
    stre:=stre&" "
```

```
EndFor
```

```
[]
```

```
str:=strb&strvar&stre
```

```
EndFunc
```

```
str_left
```

```
Define LibPriv str_left(fieldwidth, strvar, spcleft)=
```

```
Func
```

```
Local ls, lb, le, str, strb, stre, counter
```

```
str:= ""
```

```
strb:= ""
```

```
stre:= ""
```

```
ls:=dim(strvar)
```

```
lb:=spcleft
```

```
le:=fieldwidth-ls-lb
```

```
[]
```

```
For counter, 1, lb
```

```
  strb:=strb&" "
```

```
EndFor
```

```
[]
```

```
For counter, 1, le
```

```
  stre:=stre&" "
```

```
EndFor
```

```
[]
```

```
str:=strb&strvar&stre
```

```
EndFunc
```