In [9]:
```
# bhattarairaaju@gmail.com
#Task1: l1=[1,2] and l2=[3,4]. Create list l3 combining l2 and l2.
l1=[1,2]
l2=[3,4]
l3=l1+l2
print ('l3=',(l3))
```

```
l3= [1, 2, 3, 4]
```

In [11]:
```
#Task2: Use for loop to add l1 and l2.
l1=[1,2,3]
l2=[2,4,6]
l3=[]
for i in range(3):
    l3.append(l1[i]+l2[i]) #[] shoud be used !
print ('l3=', (l3))
```

```
l3= [3, 6, 9]
```

In [22]:
```
#Task3:  y=sin(x). Create a for loop where x variesfrom 0 to 360 and store y in c
#Hint: sin function has to be called using numpy.

import numpy as np
Y=[]
for x in range(0,360,15):
    y=np.sin(x*np.pi/180)
    Y.append(y)
print (Y)
```

```
[0.0, 0.25881904510252074, 0.49999999999999994, 0.7071067811865475, 0.866025403
7844386, 0.9659258262890683, 1.0, 0.9659258262890683, 0.8660254037844387, 0.707
1067811865476, 0.49999999999999994, 0.258819045102521, 1.2246467991473532e-16,
-0.25881904510252035, -0.5000000000000001, -0.7071067811865475, -0.866025403784
4384, -0.9659258262890683, -1.0, -0.9659258262890682, -0.8660254037844386, -0.7
071067811865477, -0.5000000000000004, -0.2588190451025207]
```

In [11]:
```
#Task4: Use for loop that will take this list [10, 45, 78, 59, 89, 99] as input c
m=[10, 45, 78, 59, 89, 99]
for m in m:
    if m<=50:
        print('F : Failed')
    elif m<=60:
        print('B- : Satisfactory')
    elif m<=70:
        print('B : Average')
    elif m<=80:
        print('B+ : Good')
    elif m<=90:
        print('A- : Excellent')
    else:
        print('A : Outstanding')
```

```
F : Failed
F : Failed
B+ : Good
B- : Satisfactory
A- : Excellent
A : Outstanding
```

In [224]:
```
#Task5: Create a for loop to go through the given angles to determine:
#    (i) Range of projectile fired from 5m height with speed of 30m/s (Save ans a
#   (ii) List [angle, maximum height reached]. Savethis as a dictionary{angle:hei
#  (iii) Create a plot of angle vs range.
#   (iv) create a plot of angle vs height.
#   Angles: [5, 10, 15, 20, 25, 30, 35, 40, 45]

import numpy as np
H=[]
R=[]
A1=[]
R1=[]
H1=[]
g=9.8 # m/s2
h=5 # m
v=30 # m/s
A=[5, 10, 15, 20, 25, 30, 35, 40, 45]
print('Angle','%16s'%'Range','%30s'%'Maximum Height')
for A in A:
    a=A*(np.pi)/180
    R=(v**2)*(1+(np.sqrt(1+2*g*h/(v*(np.sin(a)))**2)))*(np.sin(2*a))/(2*g)
    H=h+(v**2)*(np.sin(2*a))/(2*g)
    print('%2d'%A,'%25s'%R,'%25s'%H)
    A1.append(A)
    R1.append(R)
    H1.append(H)
```

```
Angle            Range                Maximum Height
 5         39.19815462563064        12.973640811236596
10        49.429217687428284        20.705006581280706
15         60.16096474170641        27.959183673469383
20         70.52939825601906        34.515757587647215
25         79.80350318773606        40.175510143218375
30         87.41254124399988        44.766472622754826
35         92.92949815465575        48.149150954454974
40         96.05222680383099        50.220764168927914
45         96.59064905279646         50.91836734693877
```

In [222]:
```
import matplotlib.pyplot as plt
%matplotlib inline
Angle=np.array(A1)
Range=np.array(R1)
Height=np.array(H1)
plt.plot(Angle,Height,color='blue',marker='*',linewidth=2, markersize=15, label='
plt.plot(Angle,Range,color='red',marker='*',linewidth=2, markersize=15, label='Ra
plt.title('Range and Maximum Height of a projectile', size=16)
plt.ylabel('Distance (m)', size=15)
plt.xlabel('Projection Angle (degree)', size=15)
plt.legend(loc=2)
```

Out[222]: <matplotlib.legend.Legend at 0xba600b0>