MISF Method:

Set K=3, β=1

F={sepal length, sepal width, petal length, petal width}, S={}

MI	sepal length	sepal width	petal length	petal width
class	0.4	0.9	1.3	1.15

Pick petal length

F={sepal length, sepal width, petal width}, **S={ petal length }**

Mutual Information	sepal length	sepal width	petal length	petal width
sepal length	0			
sepal width	0.25	0		
petal length	0.16	0.5	0	
petal width	0.4	0.3	0.25	0

Sepal length: I(C, sepal length) – I(sepal length, petal length) = 0.4 – 0.16 = 0.24

Sepal width: I(C, sepal width) – I(sepal width, petal length) = 0.9 – 0.4 = 0.5

Petal width: I(C, petal width) – I(petal width, petal length) = 1.15 – 0.25 = 0.9

Pick petal width

F={sepal length, sepal width}, **S={ petal length, petal width }**

Sepal length: I(C, sepal length) – (I(sepal length, petal length) + I(sepal length, petal width) = 0.4 – (0.16+0.4) = -0.16

Sepal width: I(C, sepal width) – (I(sepal width, petal length) + I(sepal width, petal width)) = 0.9 – (0.4 + 0.3) = 0.2

Pick sepal width

F={sepal length}, **S={ petal length, petal width, sepal width }**

Relief Method:

In this method, one of the object is randomly selected. The near hit was calculated from the same class where random pick belongs. The near miss was calculated from the remaining two classes and then the weight was updated using the formula. The near hit and miss were selected using the distance between two coordinates formula and compared which object is closer to the random pick compared to other objects.

	sepal length	sepal width	petal length	petal width		
	A1	A2	A3	A4		
1	5.4	3.4	1.7	0.2	Iris-setosa	**near hit**
2	5.4	3.4	1.5	0.4	Iris-setosa	**random pick1**
3	5.4	3	4.5	1.5	Iris-versicolor	**near miss**
	3.6	2.4	5.9	2.4	**RANGE**	

$$W_1 = 0 - \left(\frac{5.4-5.4}{3.6}\right)^2 + \left(\frac{5.4-5.4}{3.6}\right)^2 = 0$$

$$W_2 = 0 - \left(\frac{3.4-3.4}{2.4}\right)^2 + \left(\frac{3.4-3}{2.4}\right)^2 = 0.02778$$

$$W_3 = 0 - \left(\frac{1.5-1.7}{5.9}\right)^2 + \left(\frac{1.5-4.5}{5.9}\right)^2 = 0.2574$$

$$W_4 = 0 - \left(\frac{0.4-0.2}{2.4}\right)^2 + \left(\frac{0.4-1.5}{2.4}\right)^2 = 0.2031$$

The following table obtained after we randomly pick second object and doing same calculations.

	sepal length	sepal width	petal leng	petal width		
	x	y	z	a		
1	5.7	2.8	4.5	1.3	Iris-versicolor	**near hit**
2	5.7	2.6	3.5	1	Iris-versicolor	**random pick1**
3	5.7	2.5	5	2	Iris-virginica	**near miss**

	3.6	2.4	5.9	2.4	RANGE	

	w1	w2	w3	w4
	0	0.022569	0.293307	0.361111111
average	0	0.011285	0.146653	0.180555556

Result : If we select our threshold value to be 0.1, then petal length and petal width can be considered as best predictive attributes.