

# Annexes

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## Annexe 1 : proc means

### Species=setosa

Variable	Libellé	N	Moyenne	Ecart-type	Minimum	Maximum
SepalLength	SepalLength	50	5.0060000	0.3524897	4.3000000	5.8000000
SepalWidth	SepalWidth	50	3.4280000	0.3790644	2.3000000	4.4000000
PetalLength	PetalLength	50	1.4620000	0.1736640	1.0000000	1.9000000
PetalWidth	PetalWidth	50	0.2460000	0.1053856	0.1000000	0.6000000

### Species=versicolor

Variable	Libellé	N	Moyenne	Ecart-type	Minimum	Maximum
SepalLength	SepalLength	50	5.9360000	0.5161711	4.9000000	7.0000000
SepalWidth	SepalWidth	50	2.7700000	0.3137983	2.0000000	3.4000000
PetalLength	PetalLength	50	4.2600000	0.4699110	3.0000000	5.1000000
PetalWidth	PetalWidth	50	1.3260000	0.1977527	1.0000000	1.8000000

### Species=virginica

Variable	Libellé	N	Moyenne	Ecart-type	Minimum	Maximum
SepalLength	SepalLength	50	6.5880000	0.6358796	4.9000000	7.9000000
SepalWidth	SepalWidth	50	2.9740000	0.3224966	2.2000000	3.8000000
PetalLength	PetalLength	50	5.5520000	0.5518947	4.5000000	6.9000000
PetalWidth	PetalWidth	50	2.0260000	0.2746501	1.4000000	2.5000000

## Annexe 2

### The CANDISC Procedure

<b>Total Sample Size</b>	150	<b>DF Total</b>	149
<b>Variables</b>	4	<b>DF Within Classes</b>	147
<b>Classes</b>	3	<b>DF Between Classes</b>	2

<b>Number of Observations Read</b>	150
<b>Number of Observations Used</b>	150

### Class Level Information

<b>Species</b>	<b>Variable Name</b>	<b>Frequency</b>	<b>Weight</b>	<b>Proportion</b>
<b>setosa</b>	setosa	50	50.0000	0.333333
<b>versicolor</b>	versicolor	50	50.0000	0.333333
<b>virginica</b>	virginica	50	50.0000	0.333333

## Annexe 3 : distances de Mahalanobis entre espèces et statistiques associées

Squared Distance to Species			
From Species	setosa	versicolor	virginica
setosa	0	89.86419	179.38471
versicolor	89.86419	0	17.20107
virginica	179.38471	17.20107	0

F Statistics, NDF=4, DDF=144 for Squared Distance to Species			
From Species	setosa	versicolor	virginica
setosa	0	550.18889	1098
versicolor	550.18889	0	105.31265
virginica	1098	105.31265	0

Prob > Mahalanobis Distance for Squared Distance to Species			
From Species	setosa	versicolor	virginica
setosa	1.0000	<.0001	<.0001
versicolor	<.0001	1.0000	<.0001
virginica	<.0001	<.0001	1.0000

## Annexe 4 : Analyse de la variance

Univariate Test Statistics								
F Statistics, Num DF=2, Den DF=147								
Variable	Label	Total Standard Deviation	Pooled Standard Deviation	Between Standard Deviation	R-Square	R-Square / (1-RSq)	Valeur F	Pr > F
SepalLength	SepalLength	0.8281	0.5148	0.7951	0.6187	1.6226	119.26	<.0001
SepalWidth	SepalWidth	0.4359	0.3397	0.3368	0.4008	0.6688	49.16	<.0001
PetalLength	PetalLength	1.7653	0.4303	2.0907	0.9414	16.0566	1180.16	<.0001
PetalWidth	PetalWidth	0.7622	0.2047	0.8967	0.9289	13.0613	960.01	<.0001

Average R-Square	
Unweighted	0.7224358
Weighted by Variance	0.8689444

Statistiques multivariées et Approximations F					
S=2 M=0.5 N=71					
Statistique	Valeur	Valeur F	DDL Num.	DDL Res.	Pr > F
Wilks' Lambda	0.02343863	199.15	8	288	<.0001
Pillai's Trace	1.19189883	53.47	8	290	<.0001
Hotelling-Lawley Trace	32.47732024	582.20	8	203.4	<.0001
Roy's Greatest Root	32.19192920	1166.96	4	145	<.0001
NOTE: la statistique F pour la plus grande racine de Roy est une borne supérieure.					
NOTE: la statistique F pour Lambda de Wilks est exacte.					

# Annexe 5 : analyse discriminante

Can1 et Can2 sont les deux premiers vecteurs propres de  $W^{-1}B$

Corrélations avec les variables originales :

Total Canonical Structure			
Variable	Label	Can1	Can2
SepalLength	SepalLength	0.791888	0.217593
SepalWidth	SepalWidth	-0.530759	0.757989
PetalLength	PetalLength	0.984951	0.046037
PetalWidth	PetalWidth	0.972812	0.222902

Between Canonical Structure			
Variable	Label	Can1	Can2
SepalLength	SepalLength	0.991468	0.130348
SepalWidth	SepalWidth	-0.825658	0.564171
PetalLength	PetalLength	0.999750	0.022358
PetalWidth	PetalWidth	0.994044	0.108977

Pooled Within Canonical Structure			
Variable	Label	Can1	Can2
SepalLength	SepalLength	0.222596	0.310812
SepalWidth	SepalWidth	-0.119012	0.863681
PetalLength	PetalLength	0.706065	0.167701
PetalWidth	PetalWidth	0.633178	0.737242

## Composants des vecteurs propres

Total-Sample Standardized Canonical Coefficients			
Variable	Label	Can1	Can2
SepalLength	SepalLength	-0.686779533	0.019958173
SepalWidth	SepalWidth	-0.668825075	0.943441829
PetalLength	PetalLength	3.885795047	-1.645118866
PetalWidth	PetalWidth	2.142238715	2.164135931

Pooled Within-Class Standardized Canonical Coefficients			
Variable	Label	Can1	Can2
SepalLength	SepalLength	-0.4269548486	0.0124075316
SepalWidth	SepalWidth	-0.5212416758	0.7352613085
PetalLength	PetalLength	0.9472572487	-0.4010378190
PetalWidth	PetalWidth	0.5751607719	0.5810398645

Raw Canonical Coefficients			
Variable	Label	Can1	Can2
SepalLength	SepalLength	-0.829377642	0.024102149
SepalWidth	SepalWidth	-1.534473068	2.164521235
PetalLength	PetalLength	2.201211656	-0.931921210
PetalWidth	PetalWidth	2.810460309	2.839187853

Class Means on Canonical Variables		
Species	Can1	Can2
setosa	-7.607599927	0.215133017
versicolor	1.825049490	-0.727899622
virginica	5.782550437	0.512766605

	Corrélation canonique	Corrélation canonique ajustée	Erreur type approchée	Corrélation canonique au carré	Valeurs propres de $\text{Inv}(E^{YH}) = \text{CanRsqr}/(1-\text{CanRsqr})$				Test de $H_0$ : les corrélations canoniques de la ligne en cours et suivantes sont égales à zéro				
					Valeur propre	Différence	Proportion	Cumulé	Rapport de vraisemblance	Valeur de F approchée	DDL Num.	DDL Res.	Pr > F
1	0.984821	0.984508	0.002468	0.969872	32.1919	31.9065	0.9912	0.9912	0.02343863	199.15	8	288	<.0001
2	0.471197	0.461445	0.063734	0.222027	0.2854		0.0088	1.0000	0.77797337	13.79	3	145	<.0001