

HW1_Yufei_Wang

R Markdown

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```
##Section A
##Q1
library(tidyverse)
```

```
## — Attaching packages —
— tidyverse 1.2.1 —
```

```
## ✓ ggplot2 3.2.1      ✓ purrr 0.3.2
## ✓ tibble 2.1.3       ✓ dplyr 0.8.3
## ✓ tidyr 1.0.0        ✓ stringr 1.4.0
## ✓ readr 1.3.1        ✓ forcats 0.4.0
```

```
## — Conflicts —
— tidyverse_conflicts() —
## ✖ dplyr::filter() masks stats::filter()
## ✖ dplyr::lag() masks stats::lag()
```

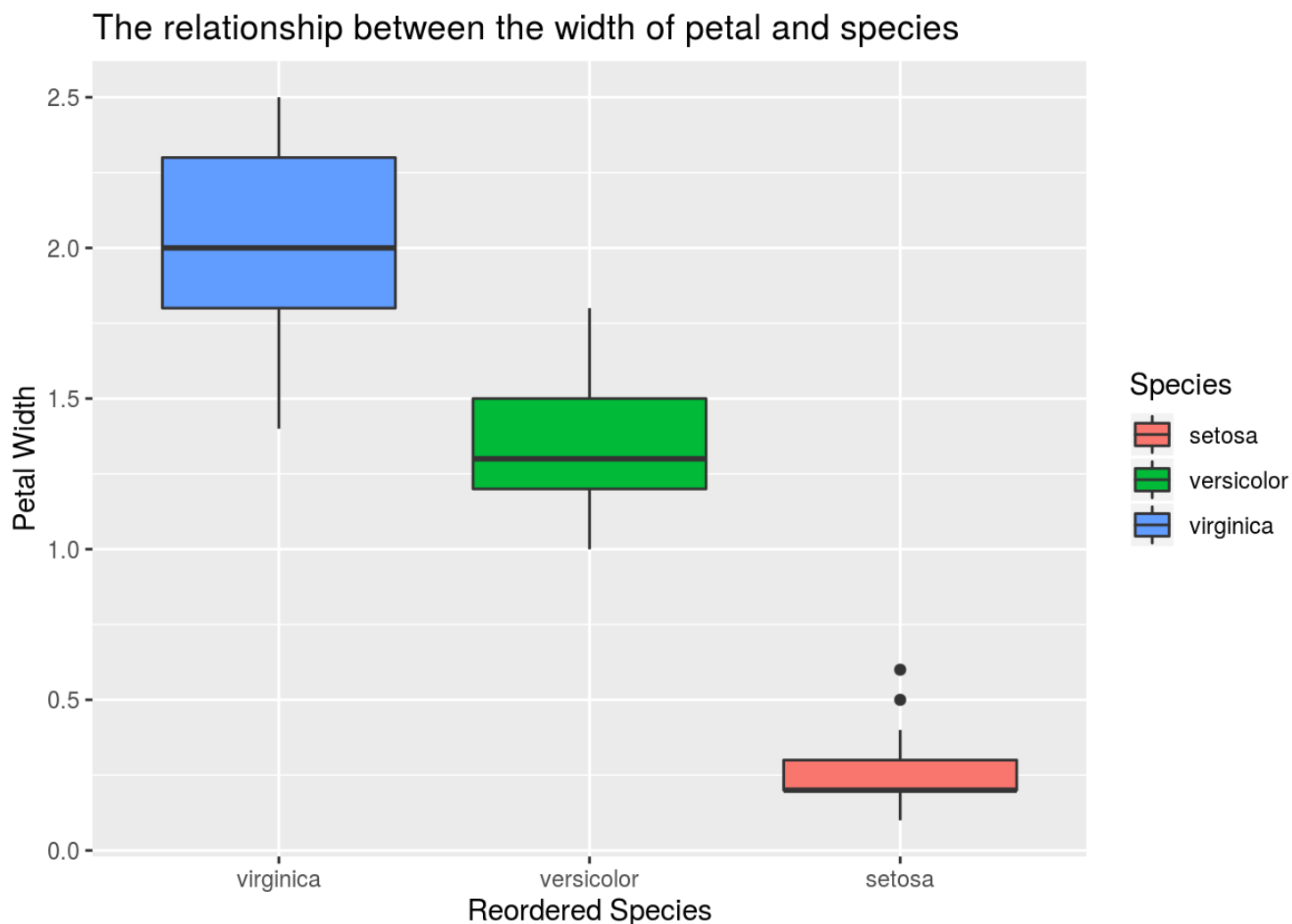
```
library(dplyr)
```

```
iris$Species2<-factor(iris$Species,levels=levels(iris$Species)[c(3,2,1)])
```

```
p1 <- ggplot(data=iris,aes(x=iris$Species2,y=iris$Petal.Width,fill=Species))+geom_boxplot()
```

```
p1<- p1+xlab("Reordered Species")+ylab("Petal Width")+ggtitle("The relationship between the width of petal and species")
```

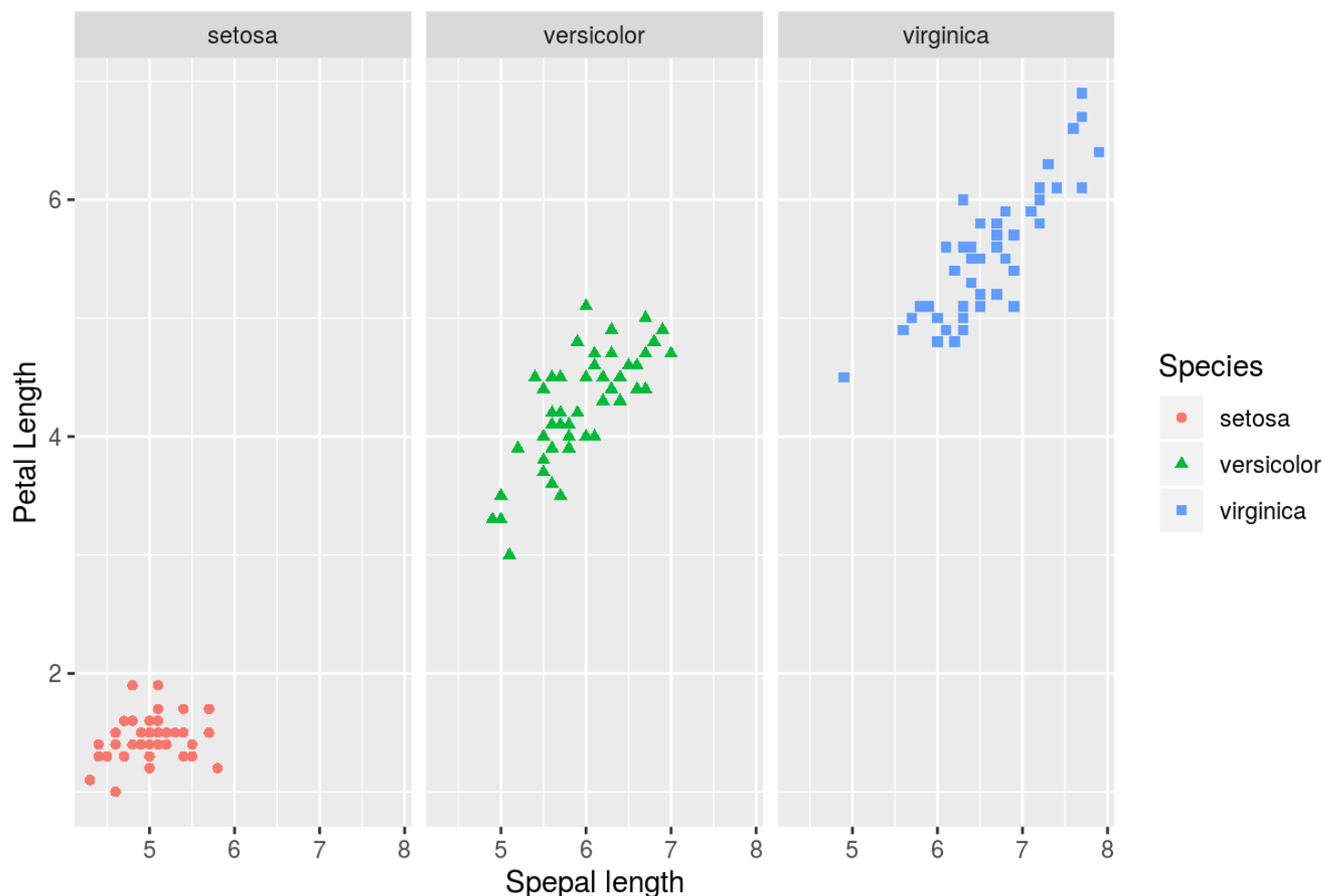
```
p1
```



#Answer: The median sepal length of virginica is 2.0, the median sepal length of versicolor is around 1.28, and the median sepal length of setosa is around 0.23 with outliers. Therefore, from the boxplot, the sepal length seems to decrease from virginica to versicolor to setosa.

```
##Q2
p2 <- ggplot(data=iris)
p2 <- p2+geom_point(mapping=aes(x=iris$Sepal.Length,y=iris$Petal.Length,shape=Species,color=Species))
p2<- p2+facet_grid(.~iris$Species)+xlab("Sepal length")+ylab("Petal Length")+ggtitle("The relationship between the length of Sepal versus the length of Petal ")
p2
```

The relationship between the length of Sepal versus the length of Petal

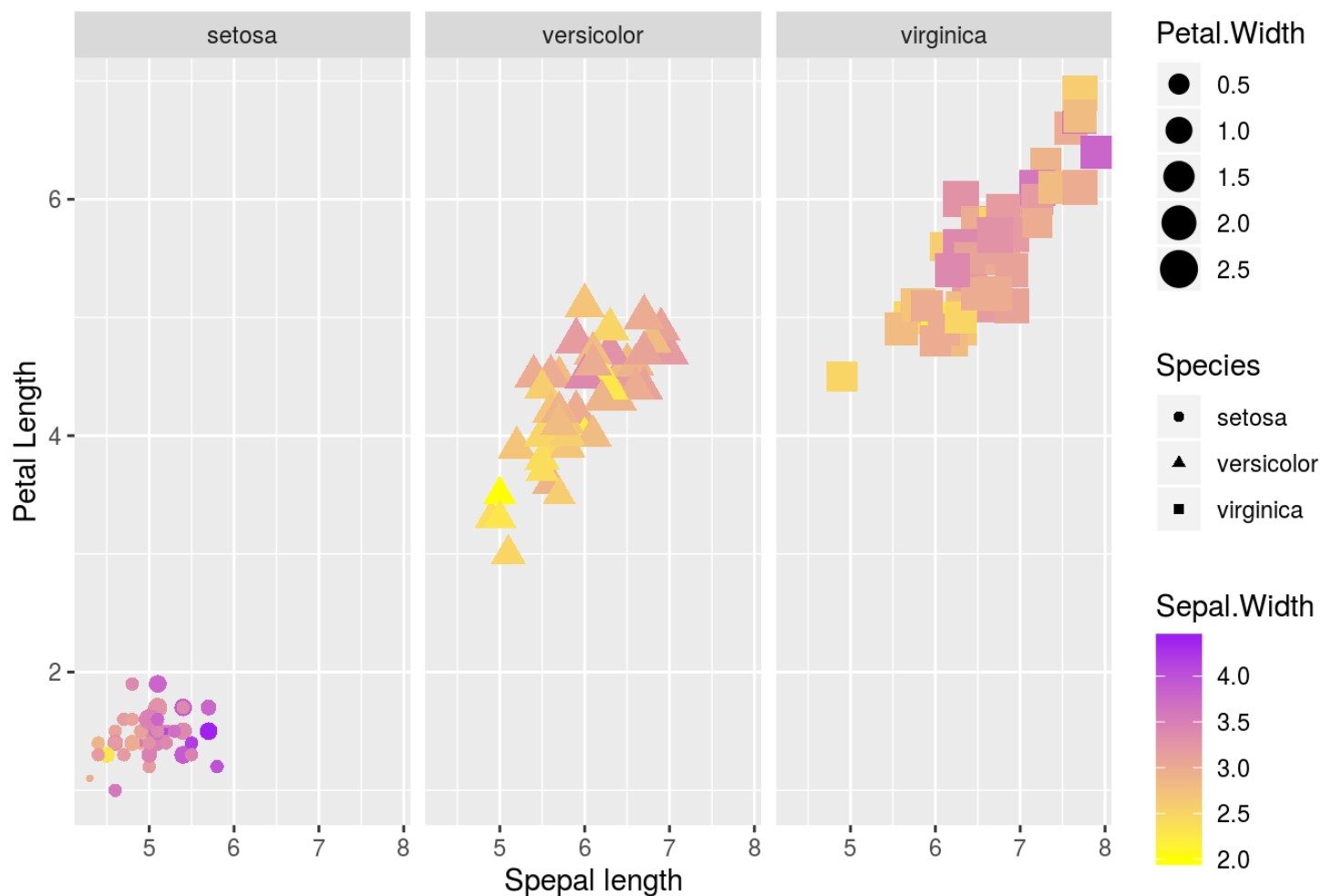


#Answer: For species setosa, there is no relationship between the length of Sepal versus the length of Petal. For species versicolor, there is a positive relationship that the length of Petal increases when the length of Sepal increases. For species virginica, there is a positive relationship that the length of Petal increases when the length of Sepal increases. Overall, there is a positive relationship between the length of Sepal and the length of Petal.

##Q3

```
p3 <- ggplot(data=iris)
p3 <- p3+geom_point(mapping=aes(x=iris$Sepal.Length,y=iris$Petal.Length,shape=Species,color=Sepal.Width,size=Petal.Width))+scale_color_gradient(low="yellow",high="purple")
p3<- p3+facet_wrap(~Species)+xlab("Sepal length")+ylab("Petal Length")+ggtitle("The relationship between four variables")
p3
```

The relationship between four variables



#Answer:For species setosa, there is no relationship between the length of Sepal and the length of Petal.The color showed that Sepal width ranged from 2.0 to 4.0, and the average Petal width ranged from 1 to 1.5.For species versicolor, there is a positive relationship that the length of Petal increases when the length of Sepal increases. The color showed that Sepal width ranged from 2 to 3.2, and the average Petal width ranged from 1 to 1.5.For species virginica,there is a positive relationship that the length of Petal increases when the length of Sepal increases.The color showed that Sepal width ranged from 2 to 3.7, and the average Petal width ranged from 1 to 1.5.Overall ,there is the positive relationship between the length of Sepal and the length of Petal, and the sepal width and Petal width have no relationships with the length of Sepal and the length of Petal, which showed as clusters in the plot.

##Section B

##Q1

#create the new dataframe

```
mpg1 <-data.frame("manufacturer"=mpg$manufacturer, "model"=mpg$model
, "trans"=mpg$trans,"drv"=mpg$drv,"hwy"=mpg$hwy,"class"=mpg$class)
colnames(mpg1)
```

```
## [1] "manufacturer" "model"          "trans"          "drv"
## [5] "hwy"           "class"
```

#use the R basic function to rename columns
names(mpg1)

```
## [1] "manufacturer" "model"          "trans"          "drv"
## [5] "hwy"           "class"
```

```
names(mpg1)[names(mpg1) == "drv"] <- "driveType"
names(mpg1)[names(mpg1) == "hwy"] <- "hwyMPG"
names(mpg1)[names(mpg1) == "trans"] <- "TransmissionType"
mpg1
```

##	manufacturer	model	TransmissionType	driveType
e hwyMPG				
## 1	audi	a4	auto(l5)	
f 29				
## 2	audi	a4	manual(m5)	
f 29				
## 3	audi	a4	manual(m6)	
f 31				
## 4	audi	a4	auto(av)	
f 30				
## 5	audi	a4	auto(l5)	
f 26				
## 6	audi	a4	manual(m5)	
f 26				
## 7	audi	a4	auto(av)	
f 27				
## 8	audi	a4 quattro	manual(m5)	
4 26				
## 9	audi	a4 quattro	auto(l5)	
4 25				
## 10	audi	a4 quattro	manual(m6)	
4 28				
## 11	audi	a4 quattro	auto(s6)	
4 27				
## 12	audi	a4 quattro	auto(l5)	
4 25				
## 13	audi	a4 quattro	manual(m5)	
4 25				
## 14	audi	a4 quattro	auto(s6)	
4 25				
## 15	audi	a4 quattro	manual(m6)	
4 25				
## 16	audi	a6 quattro	auto(l5)	
4 24				
## 17	audi	a6 quattro	auto(s6)	
4 25				
## 18	audi	a6 quattro	auto(s6)	
4 23				
## 19	chevrolet	c1500 suburban 2wd	auto(l4)	
r 20				
## 20	chevrolet	c1500 suburban 2wd	auto(l4)	

r	15				
##	21	chevrolet	c1500 suburban 2wd		auto(14)
r	20				
##	22	chevrolet	c1500 suburban 2wd		auto(14)
r	17				
##	23	chevrolet	c1500 suburban 2wd		auto(14)
r	17				
##	24	chevrolet	corvette		manual(m6)
r	26				
##	25	chevrolet	corvette		auto(14)
r	23				
##	26	chevrolet	corvette		manual(m6)
r	26				
##	27	chevrolet	corvette		auto(s6)
r	25				
##	28	chevrolet	corvette		manual(m6)
r	24				
##	29	chevrolet	k1500 tahoe 4wd		auto(14)
4	19				
##	30	chevrolet	k1500 tahoe 4wd		auto(14)
4	14				
##	31	chevrolet	k1500 tahoe 4wd		auto(14)
4	15				
##	32	chevrolet	k1500 tahoe 4wd		auto(14)
4	17				
##	33	chevrolet	malibu		auto(14)
f	27				
##	34	chevrolet	malibu		auto(14)
f	30				
##	35	chevrolet	malibu		auto(14)
f	26				
##	36	chevrolet	malibu		auto(14)
f	29				
##	37	chevrolet	malibu		auto(s6)
f	26				
##	38	dodge	caravan 2wd		auto(13)
f	24				
##	39	dodge	caravan 2wd		auto(14)
f	24				
##	40	dodge	caravan 2wd		auto(14)
f	22				
##	41	dodge	caravan 2wd		auto(14)

f	22			
##	42	dodge	caravan 2wd	auto(14)
f	24			
##	43	dodge	caravan 2wd	auto(14)
f	24			
##	44	dodge	caravan 2wd	auto(14)
f	17			
##	45	dodge	caravan 2wd	auto(14)
f	22			
##	46	dodge	caravan 2wd	auto(14)
f	21			
##	47	dodge	caravan 2wd	auto(16)
f	23			
##	48	dodge	caravan 2wd	auto(16)
f	23			
##	49	dodge	dakota pickup 4wd	manual(m6)
4	19			
##	50	dodge	dakota pickup 4wd	auto(14)
4	18			
##	51	dodge	dakota pickup 4wd	auto(14)
4	17			
##	52	dodge	dakota pickup 4wd	manual(m5)
4	17			
##	53	dodge	dakota pickup 4wd	auto(15)
4	19			
##	54	dodge	dakota pickup 4wd	auto(15)
4	19			
##	55	dodge	dakota pickup 4wd	auto(15)
4	12			
##	56	dodge	dakota pickup 4wd	manual(m5)
4	17			
##	57	dodge	dakota pickup 4wd	auto(14)
4	15			
##	58	dodge	durango 4wd	auto(14)
4	17			
##	59	dodge	durango 4wd	auto(15)
4	17			
##	60	dodge	durango 4wd	auto(15)
4	12			
##	61	dodge	durango 4wd	auto(15)
4	17			
##	62	dodge	durango 4wd	auto(14)

4	16				
##	63	dodge		durango 4wd	auto(15)
4	18				
##	64	dodge		durango 4wd	auto(14)
4	15				
##	65	dodge	ram 1500 pickup	4wd	manual(m6)
4	16				
##	66	dodge	ram 1500 pickup	4wd	auto(15)
4	12				
##	67	dodge	ram 1500 pickup	4wd	auto(15)
4	17				
##	68	dodge	ram 1500 pickup	4wd	auto(15)
4	17				
##	69	dodge	ram 1500 pickup	4wd	manual(m6)
4	16				
##	70	dodge	ram 1500 pickup	4wd	manual(m6)
4	12				
##	71	dodge	ram 1500 pickup	4wd	auto(14)
4	15				
##	72	dodge	ram 1500 pickup	4wd	manual(m5)
4	16				
##	73	dodge	ram 1500 pickup	4wd	auto(15)
4	17				
##	74	dodge	ram 1500 pickup	4wd	auto(14)
4	15				
##	75	ford	expedition	2wd	auto(14)
r	17				
##	76	ford	expedition	2wd	auto(14)
r	17				
##	77	ford	expedition	2wd	auto(16)
r	18				
##	78	ford	explorer	4wd	auto(15)
4	17				
##	79	ford	explorer	4wd	manual(m5)
4	19				
##	80	ford	explorer	4wd	auto(15)
4	17				
##	81	ford	explorer	4wd	auto(15)
4	19				
##	82	ford	explorer	4wd	auto(16)
4	19				
##	83	ford	explorer	4wd	auto(14)

4	17				
##	84		ford	f150 pickup 4wd	auto(14)
4	17				
##	85		ford	f150 pickup 4wd	manual(m5)
4	17				
##	86		ford	f150 pickup 4wd	manual(m5)
4	16				
##	87		ford	f150 pickup 4wd	auto(14)
4	16				
##	88		ford	f150 pickup 4wd	auto(14)
4	17				
##	89		ford	f150 pickup 4wd	auto(14)
4	15				
##	90		ford	f150 pickup 4wd	auto(14)
4	17				
##	91		ford	mustang	manual(m5)
r	26				
##	92		ford	mustang	auto(14)
r	25				
##	93		ford	mustang	manual(m5)
r	26				
##	94		ford	mustang	auto(15)
r	24				
##	95		ford	mustang	auto(14)
r	21				
##	96		ford	mustang	manual(m5)
r	22				
##	97		ford	mustang	manual(m5)
r	23				
##	98		ford	mustang	auto(15)
r	22				
##	99		ford	mustang	manual(m6)
r	20				
##	100		honda	civic	manual(m5)
f	33				
##	101		honda	civic	auto(14)
f	32				
##	102		honda	civic	manual(m5)
f	32				
##	103		honda	civic	manual(m5)
f	29				
##	104		honda	civic	auto(14)

f	32			
##	105	honda	civic	manual(m5)
f	34			
##	106	honda	civic	auto(15)
f	36			
##	107	honda	civic	auto(15)
f	36			
##	108	honda	civic	manual(m6)
f	29			
##	109	hyundai	sonata	auto(14)
f	26			
##	110	hyundai	sonata	manual(m5)
f	27			
##	111	hyundai	sonata	auto(14)
f	30			
##	112	hyundai	sonata	manual(m5)
f	31			
##	113	hyundai	sonata	auto(14)
f	26			
##	114	hyundai	sonata	manual(m5)
f	26			
##	115	hyundai	sonata	auto(15)
f	28			
##	116	hyundai	tiburon	auto(14)
f	26			
##	117	hyundai	tiburon	manual(m5)
f	29			
##	118	hyundai	tiburon	manual(m5)
f	28			
##	119	hyundai	tiburon	auto(14)
f	27			
##	120	hyundai	tiburon	auto(14)
f	24			
##	121	hyundai	tiburon	manual(m6)
f	24			
##	122	hyundai	tiburon	manual(m5)
f	24			
##	123	jeep	grand cherokee 4wd	auto(15)
4	22			
##	124	jeep	grand cherokee 4wd	auto(15)
4	19			
##	125	jeep	grand cherokee 4wd	auto(14)

4	20			
##	126	jeep	grand cherokee 4wd	auto(14)
4	17			
##	127	jeep	grand cherokee 4wd	auto(15)
4	12			
##	128	jeep	grand cherokee 4wd	auto(15)
4	19			
##	129	jeep	grand cherokee 4wd	auto(15)
4	18			
##	130	jeep	grand cherokee 4wd	auto(15)
4	14			
##	131	land rover	range rover	auto(14)
4	15			
##	132	land rover	range rover	auto(s6)
4	18			
##	133	land rover	range rover	auto(s6)
4	18			
##	134	land rover	range rover	auto(14)
4	15			
##	135	lincoln	navigator 2wd	auto(14)
r	17			
##	136	lincoln	navigator 2wd	auto(14)
r	16			
##	137	lincoln	navigator 2wd	auto(16)
r	18			
##	138	mercury	mountaineer 4wd	auto(15)
4	17			
##	139	mercury	mountaineer 4wd	auto(15)
4	19			
##	140	mercury	mountaineer 4wd	auto(16)
4	19			
##	141	mercury	mountaineer 4wd	auto(14)
4	17			
##	142	nissan	altima	manual(m5)
f	29			
##	143	nissan	altima	auto(14)
f	27			
##	144	nissan	altima	auto(av)
f	31			
##	145	nissan	altima	manual(m6)
f	32			
##	146	nissan	altima	manual(m6)

f	27			
##	147	nissan	altima	auto(av)
f	26			
##	148	nissan	maxima	auto(l4)
f	26			
##	149	nissan	maxima	manual(m5)
f	25			
##	150	nissan	maxima	auto(av)
f	25			
##	151	nissan	pathfinder 4wd	auto(l4)
4	17			
##	152	nissan	pathfinder 4wd	manual(m5)
4	17			
##	153	nissan	pathfinder 4wd	auto(l5)
4	20			
##	154	nissan	pathfinder 4wd	auto(s5)
4	18			
##	155	pontiac	grand prix	auto(l4)
f	26			
##	156	pontiac	grand prix	auto(l4)
f	26			
##	157	pontiac	grand prix	auto(l4)
f	27			
##	158	pontiac	grand prix	auto(l4)
f	28			
##	159	pontiac	grand prix	auto(s4)
f	25			
##	160	subaru	forester awd	manual(m5)
4	25			
##	161	subaru	forester awd	auto(l4)
4	24			
##	162	subaru	forester awd	manual(m5)
4	27			
##	163	subaru	forester awd	manual(m5)
4	25			
##	164	subaru	forester awd	auto(l4)
4	26			
##	165	subaru	forester awd	auto(l4)
4	23			
##	166	subaru	impreza awd	auto(l4)
4	26			
##	167	subaru	impreza awd	manual(m5)

4	26			
##	168	subaru	impreza awd	manual(m5)
4	26			
##	169	subaru	impreza awd	auto(l4)
4	26			
##	170	subaru	impreza awd	auto(s4)
4	25			
##	171	subaru	impreza awd	auto(s4)
4	27			
##	172	subaru	impreza awd	manual(m5)
4	25			
##	173	subaru	impreza awd	manual(m5)
4	27			
##	174	toyota	4runner 4wd	manual(m5)
4	20			
##	175	toyota	4runner 4wd	auto(l4)
4	20			
##	176	toyota	4runner 4wd	auto(l4)
4	19			
##	177	toyota	4runner 4wd	manual(m5)
4	17			
##	178	toyota	4runner 4wd	auto(l5)
4	20			
##	179	toyota	4runner 4wd	auto(l5)
4	17			
##	180	toyota	camry	manual(m5)
f	29			
##	181	toyota	camry	auto(l4)
f	27			
##	182	toyota	camry	manual(m5)
f	31			
##	183	toyota	camry	auto(l5)
f	31			
##	184	toyota	camry	auto(l4)
f	26			
##	185	toyota	camry	manual(m5)
f	26			
##	186	toyota	camry	auto(s6)
f	28			
##	187	toyota	camry solara	auto(l4)
f	27			
##	188	toyota	camry solara	manual(m5)

f	29			
##	189	toyota	camry solara	manual(m5)
f	31			
##	190	toyota	camry solara	auto(s5)
f	31			
##	191	toyota	camry solara	auto(14)
f	26			
##	192	toyota	camry solara	manual(m5)
f	26			
##	193	toyota	camry solara	auto(s5)
f	27			
##	194	toyota	corolla	auto(13)
f	30			
##	195	toyota	corolla	auto(14)
f	33			
##	196	toyota	corolla	manual(m5)
f	35			
##	197	toyota	corolla	manual(m5)
f	37			
##	198	toyota	corolla	auto(14)
f	35			
##	199	toyota land cruiser wagon 4wd		auto(14)
4	15			
##	200	toyota land cruiser wagon 4wd		auto(s6)
4	18			
##	201	toyota	toyota tacoma 4wd	manual(m5)
4	20			
##	202	toyota	toyota tacoma 4wd	auto(14)
4	20			
##	203	toyota	toyota tacoma 4wd	manual(m5)
4	22			
##	204	toyota	toyota tacoma 4wd	manual(m5)
4	17			
##	205	toyota	toyota tacoma 4wd	auto(14)
4	19			
##	206	toyota	toyota tacoma 4wd	manual(m6)
4	18			
##	207	toyota	toyota tacoma 4wd	auto(15)
4	20			
##	208	volkswagen	gti	manual(m5)
f	29			
##	209	volkswagen	gti	auto(14)

f	26			
##	210	volkswagen	gti	manual(m6)
f	29			
##	211	volkswagen	gti	auto(s6)
f	29			
##	212	volkswagen	gti	manual(m5)
f	24			
##	213	volkswagen	jetta	manual(m5)
f	44			
##	214	volkswagen	jetta	manual(m5)
f	29			
##	215	volkswagen	jetta	auto(14)
f	26			
##	216	volkswagen	jetta	auto(s6)
f	29			
##	217	volkswagen	jetta	manual(m6)
f	29			
##	218	volkswagen	jetta	auto(s6)
f	29			
##	219	volkswagen	jetta	manual(m5)
f	29			
##	220	volkswagen	jetta	auto(14)
f	23			
##	221	volkswagen	jetta	manual(m5)
f	24			
##	222	volkswagen	new beetle	manual(m5)
f	44			
##	223	volkswagen	new beetle	auto(14)
f	41			
##	224	volkswagen	new beetle	manual(m5)
f	29			
##	225	volkswagen	new beetle	auto(14)
f	26			
##	226	volkswagen	new beetle	manual(m5)
f	28			
##	227	volkswagen	new beetle	auto(s6)
f	29			
##	228	volkswagen	passat	manual(m5)
f	29			
##	229	volkswagen	passat	auto(15)
f	29			
##	230	volkswagen	passat	auto(s6)

f	28			
##	231	volkswagen	passat	manual(m6)
f	29			
##	232	volkswagen	passat	auto(15)
f	26			
##	233	volkswagen	passat	manual(m5)
f	26			
##	234	volkswagen	passat	auto(s6)
f	26			
##		class		
##	1	compact		
##	2	compact		
##	3	compact		
##	4	compact		
##	5	compact		
##	6	compact		
##	7	compact		
##	8	compact		
##	9	compact		
##	10	compact		
##	11	compact		
##	12	compact		
##	13	compact		
##	14	compact		
##	15	compact		
##	16	midsize		
##	17	midsize		
##	18	midsize		
##	19	suv		
##	20	suv		
##	21	suv		
##	22	suv		
##	23	suv		
##	24	2seater		
##	25	2seater		
##	26	2seater		
##	27	2seater		
##	28	2seater		
##	29	suv		
##	30	suv		
##	31	suv		
##	32	suv		

##	33	midsize
##	34	midsize
##	35	midsize
##	36	midsize
##	37	midsize
##	38	minivan
##	39	minivan
##	40	minivan
##	41	minivan
##	42	minivan
##	43	minivan
##	44	minivan
##	45	minivan
##	46	minivan
##	47	minivan
##	48	minivan
##	49	pickup
##	50	pickup
##	51	pickup
##	52	pickup
##	53	pickup
##	54	pickup
##	55	pickup
##	56	pickup
##	57	pickup
##	58	suv
##	59	suv
##	60	suv
##	61	suv
##	62	suv
##	63	suv
##	64	suv
##	65	pickup
##	66	pickup
##	67	pickup
##	68	pickup
##	69	pickup
##	70	pickup
##	71	pickup
##	72	pickup
##	73	pickup
##	74	pickup

##	75	suv
##	76	suv
##	77	suv
##	78	suv
##	79	suv
##	80	suv
##	81	suv
##	82	suv
##	83	suv
##	84	pickup
##	85	pickup
##	86	pickup
##	87	pickup
##	88	pickup
##	89	pickup
##	90	pickup
##	91	subcompact
##	92	subcompact
##	93	subcompact
##	94	subcompact
##	95	subcompact
##	96	subcompact
##	97	subcompact
##	98	subcompact
##	99	subcompact
##	100	subcompact
##	101	subcompact
##	102	subcompact
##	103	subcompact
##	104	subcompact
##	105	subcompact
##	106	subcompact
##	107	subcompact
##	108	subcompact
##	109	midsize
##	110	midsize
##	111	midsize
##	112	midsize
##	113	midsize
##	114	midsize
##	115	midsize
##	116	subcompact

##	117	subcompact
##	118	subcompact
##	119	subcompact
##	120	subcompact
##	121	subcompact
##	122	subcompact
##	123	suv
##	124	suv
##	125	suv
##	126	suv
##	127	suv
##	128	suv
##	129	suv
##	130	suv
##	131	suv
##	132	suv
##	133	suv
##	134	suv
##	135	suv
##	136	suv
##	137	suv
##	138	suv
##	139	suv
##	140	suv
##	141	suv
##	142	compact
##	143	compact
##	144	midsize
##	145	midsize
##	146	midsize
##	147	midsize
##	148	midsize
##	149	midsize
##	150	midsize
##	151	suv
##	152	suv
##	153	suv
##	154	suv
##	155	midsize
##	156	midsize
##	157	midsize
##	158	midsize

##	159	midsize
##	160	suv
##	161	suv
##	162	suv
##	163	suv
##	164	suv
##	165	suv
##	166	subcompact
##	167	subcompact
##	168	subcompact
##	169	subcompact
##	170	compact
##	171	compact
##	172	compact
##	173	compact
##	174	suv
##	175	suv
##	176	suv
##	177	suv
##	178	suv
##	179	suv
##	180	midsize
##	181	midsize
##	182	midsize
##	183	midsize
##	184	midsize
##	185	midsize
##	186	midsize
##	187	compact
##	188	compact
##	189	compact
##	190	compact
##	191	compact
##	192	compact
##	193	compact
##	194	compact
##	195	compact
##	196	compact
##	197	compact
##	198	compact
##	199	suv
##	200	suv

##	201	pickup
##	202	pickup
##	203	pickup
##	204	pickup
##	205	pickup
##	206	pickup
##	207	pickup
##	208	compact
##	209	compact
##	210	compact
##	211	compact
##	212	compact
##	213	compact
##	214	compact
##	215	compact
##	216	compact
##	217	compact
##	218	compact
##	219	compact
##	220	compact
##	221	compact
##	222	subcompact
##	223	subcompact
##	224	subcompact
##	225	subcompact
##	226	subcompact
##	227	subcompact
##	228	midsize
##	229	midsize
##	230	midsize
##	231	midsize
##	232	midsize
##	233	midsize
##	234	midsize

##Q2

##Create the new datafram

```
mpg2 <- mpg1[mpg1$manufacturer %in% c("ford","honda","jeep","hyundai",  
  "nissan","toyota"),]  
result1 <- mpg2[mpg2$class=="suv" & mpg2$hwyMPG>"18" & mpg2$driveType=="4",]  
suv <- list(result1)  
suv[[1]]
```

##	manufacturer	model	TransmissionType	driveType	hw
## 79	ford	explorer 4wd	manual(m5)		4
## 81	ford	explorer 4wd	auto(15)		4
## 82	ford	explorer 4wd	auto(16)		4
## 123	jeep grand cherokee	4wd	auto(15)		4
## 124	jeep grand cherokee	4wd	auto(15)		4
## 125	jeep grand cherokee	4wd	auto(14)		4
## 128	jeep grand cherokee	4wd	auto(15)		4
## 153	nissan	pathfinder 4wd	auto(15)		4
## 174	toyota	4runner 4wd	manual(m5)		4
## 175	toyota	4runner 4wd	auto(14)		4
## 176	toyota	4runner 4wd	auto(14)		4
## 178	toyota	4runner 4wd	auto(15)		4
##	class				
## 79	suv				
## 81	suv				
## 82	suv				
## 123	suv				
## 124	suv				
## 125	suv				
## 128	suv				
## 153	suv				
## 174	suv				
## 175	suv				
## 176	suv				
## 178	suv				


```
names(suv) <- "suv18"
```

```
##Q3
```

```
##create the function
```

```
applyFun_11 <- function(df,col_name,f,...){  
  m<-as.vector(df[[col_name]])  
  n <- f(m,...)  
  cat(as.character(substitute(f)),"of",as.character(substitute(col_n  
ame)), "is",deparse(n))  
}
```

```
##outputs
```

```
applyFun_11(mpg,"hwy", mean)
```

```
## mean of hwy is 23.4401709401709
```

```
applyFun_11(mpg,"hwy", length)
```

```
## length of hwy is 234L
```

```
applyFun_11(mpg,"hwy",quantile, probs=(1:3/4))
```

```
## quantile of hwy is c("25%" = 18, "50%" = 24, "75%" = 27)
```

```
applyFun_11(suv[[1]],"hwyMPG",quantile,probs=(1:3/4))
```

```
## quantile of hwyMPG is c("25%" = 19, "50%" = 19.5, "75%" = 20)
```

```
...
```