

Exploratory Data Analysis

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- Importing Data
 - From Text Files
 - Excel Spreadsheets
 - Statistical Packages
 - Databases
- Cleaning Data
 - Selecting Variables
 - Selecting Observations
 - Creating/Recoding variables
 - Summarizing Data
 - Using Pipes
 - Missing Data

Importing Data

R can import data from almost any source, including text files, excel spreadsheets, statistical packages, and database management systems.

From Text Files

```
library(readr)

# import data from a comma delimited file
Salaries = read_csv("~/Dropbox/Priya-PhD- Documents/Courses/Data Analysis and Visualization-Fall
2019/Datasets/Salaries.csv")

# import data from a tab delimited file
Salaries = read_tsv("~/Dropbox/Priya-PhD- Documents/Courses/Data Analysis and Visualization-Fall
2019/Datasets/Salaries.txt")
```

These function assume that the first line of data contains the variable names, values are separated by commas or tabs respectively, and that missing data are represented by blanks.

Excel Spreadsheets

```
library(readxl)

# import data from an Excel workbook
Salaries = read_excel("~/Dropbox/Priya-PhD- Documents/Courses/Data Analysis and Visualization-Fall
2019/Datasets/Academic Salaries Data/salaries.xlsx",
  sheet = 1)
```

Since workbooks can have more than one worksheet, you can specify the one you want with the `sheet` option. The default is `sheet = 1`.

Statistical Packages

```
library(haven)

# import data from Stata
Salaries = read_dta("~/Dropbox/Priya-PhD- Documents/Courses/Data Analysis and Visualization-Fall
2019/Datasets/Academic Salaries Data/salaries.dta")

# import data from SPSS
Salaries = read_sav("~/Dropbox/Priya-PhD- Documents/Courses/Data Analysis and Visualization-Fall
2019/Datasets/Academic Salaries Data/salaries.sav")

# import data from SAS
Salaries = read_sas("~/Dropbox/Priya-PhD- Documents/Courses/Data Analysis and Visualization-Fall
2019/Datasets/Academic Salaries Data/salaries.sas7bdat")
```

Databases

Importing data from a database requires additional steps. Depending on the database containing the data, the following packages can help: RODBC, RMySQL, ROracle, RPostgreSQL, RSQLite, and RMongo. In the newest versions of RStudio, you can use the Connections pane to quickly access the data stored in database management systems.

Cleaning Data

The processes of cleaning your data can be the most time-consuming part of any data analysis. The most important steps are considered below.

In this section we will use the starwars dataset from the dplyr package. The dataset provides descriptions of 87 characters from the Starwars universe on 13 variables.

Selecting Variables

The select function allows you to limit your dataset to specified variables (columns).

```
library(dplyr)

# keep the variables name, height, and gender
newdata = select(starwars, name, height, gender)
newdata

# keep the variables name and all variables between mass and species
# inclusive
newdata = select(starwars, name, mass:species)
newdata

# keep all variables except birth_year and gender
newdata = select(starwars, -birth_year, -gender)
newdata
```

name	height	gender
Luke Skywalker	172	male
C-3PO	167	NA
R2-D2	96	NA
Darth Vader	202	male
Leia Organa	150	female
Owen Lars	178	male
Beru Whitesun lars	165	female
R5-D4	97	NA
Biggs Darklighter	183	male
Obi-Wan Kenobi	182	male
Anakin Skywalker	188	male
Wilhuff Tarkin	180	male
Chewbacca	228	male
Han Solo	180	male
Greedo	173	male
Jabba Desilijic Tiure	175	hermaphrodite
Wedge Antilles	170	male
Jek Tono Porkins	180	male
Yoda	66	male
Palpatine	170	male
Boba Fett	183	male
IG-88	200	none
Bossk	190	male
Lando Calrissian	177	male
Lobot	175	male
Ackbar	180	male
Mon Mothma	150	female

name	height	gender
Arvel Crynyd	NA	male
Wicket Systri Warrick	88	male
Nien Nunb	160	male
Qui-Gon Jinn	193	male
Nute Gunray	191	male
Finis Valorum	170	male
Jar Jar Binks	196	male
Roos Tarpals	224	male
Rugor Nass	206	male
Ric Olié	183	male
Watto	137	male
Sebulba	112	male
Quarsh Panaka	183	male
Shmi Skywalker	163	female
Darth Maul	175	male
Bib Fortuna	180	male
Ayla Secura	178	female
Dud Bolt	94	male
Gasgano	122	male
Ben Quadinaros	163	male
Mace Windu	188	male
Ki-Adi-Mundi	198	male
Kit Fisto	196	male
Eeth Koth	171	male
Adi Gallia	184	female
Saesee Tiin	188	male
Yarael Poof	264	male
Plo Koon	188	male
Mas Amedda	196	male
Gregar Typho	185	male
Cordé	157	female
Cliegg Lars	183	male
Poggle the Lesser	183	male
Luminara Unduli	170	female
Barriss Offee	166	female
Dormé	165	female
Dooku	193	male
Bail Prestor Organa	191	male
Jango Fett	183	male
Zam Wesell	168	female
Dexter Jettster	198	male
Lama Su	229	male
Taun We	213	female
Jocasta Nu	167	female
Ratts Tyerell	79	male
R4-P17	96	female
Wat Tambor	193	male
San Hill	191	male
Shaak Ti	178	female

name	height	gender
Grievous	216	male
Tarfful	234	male
Raymus Antilles	188	male
Sly Moore	178	female
Tion Medon	206	male
Finn	NA	male
Rey	NA	female
Poe Dameron	NA	male
BB8	NA	none
Captain Phasma	NA	female
Padmé Amidala	165	female

name	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species
Luke Skywalker	77.0	blond	fair	blue	19.0	male	Tatooine	Human
C-3PO	75.0	NA	gold	yellow	112.0	NA	Tatooine	Droid
R2-D2	32.0	NA	white, blue	red	33.0	NA	Naboo	Droid
Darth Vader	136.0	none	white	yellow	41.9	male	Tatooine	Human
Leia Organa	49.0	brown	light	brown	19.0	female	Alderaan	Human
Owen Lars	120.0	brown, grey	light	blue	52.0	male	Tatooine	Human
Beru Whitesun lars	75.0	brown	light	blue	47.0	female	Tatooine	Human
R5-D4	32.0	NA	white, red	red	NA	NA	Tatooine	Droid
Biggs Darklighter	84.0	black	light	brown	24.0	male	Tatooine	Human
Obi-Wan Kenobi	77.0	auburn, white	fair	blue-gray	57.0	male	Stewjon	Human
Anakin Skywalker	84.0	blond	fair	blue	41.9	male	Tatooine	Human
Wilhuff Tarkin	NA	auburn, grey	fair	blue	64.0	male	Eriadu	Human
Chewbacca	112.0	brown	unknown	blue	200.0	male	Kashyyyk	Wookiee
Han Solo	80.0	brown	fair	brown	29.0	male	Corellia	Human
Greedo	74.0	NA	green	black	44.0	male	Rodia	Rodian
Jabba Desilijic Tiure	1358.0	NA	green-tan, brown	orange	600.0	hermaphrodite	Nal Hutta	Hutt
Wedge Antilles	77.0	brown	fair	hazel	21.0	male	Corellia	Human
Jek Tono Porkins	110.0	brown	fair	blue	NA	male	Bestine IV	Human
Yoda	17.0	white	green	brown	896.0	male	NA	Yoda's species
Palpatine	75.0	grey	pale	yellow	82.0	male	Naboo	Human
Boba Fett	78.2	black	fair	brown	31.5	male	Kamino	Human
IG-88	140.0	none	metal	red	15.0	none	NA	Droid
Bossk	113.0	none	green	red	53.0	male	Trandosha	Trandoshan
Lando Calrissian	79.0	black	dark	brown	31.0	male	Socorro	Human
Lobot	79.0	none	light	blue	37.0	male	Bespin	Human

name	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species
Ackbar	83.0	none	brown mottle	orange	41.0	male	Mon Cala	Mon Calamari
Mon Mothma	NA	auburn	fair	blue	48.0	female	Chandrilra	Human
Arvel Crynyd	NA	brown	fair	brown	NA	male	NA	Human
Wicket Systri Warrick	20.0	brown	brown	brown	8.0	male	Endor	Ewok
Nien Nunb	68.0	none	grey	black	NA	male	Sullust	Sullustan
Qui-Gon Jinn	89.0	brown	fair	blue	92.0	male	NA	Human
Nute Gunray	90.0	none	mottled green	red	NA	male	Cato Neimoidia	Neimodian
Finis Valorum	NA	blond	fair	blue	91.0	male	Coruscant	Human
Jar Jar Binks	66.0	none	orange	orange	52.0	male	Naboo	Gungan
Roos Tarpals	82.0	none	grey	orange	NA	male	Naboo	Gungan
Rugor Nass	NA	none	green	orange	NA	male	Naboo	Gungan
Ric Olié	NA	brown	fair	blue	NA	male	Naboo	NA
Watto	NA	black	blue, grey	yellow	NA	male	Toydaria	Toydarian
Sebulba	40.0	none	grey, red	orange	NA	male	Malastare	Dug
Quarsh Panaka	NA	black	dark	brown	62.0	male	Naboo	NA
Shmi Skywalker	NA	black	fair	brown	72.0	female	Tatooine	Human
Darth Maul	80.0	none	red	yellow	54.0	male	Dathomir	Zabrak
Bib Fortuna	NA	none	pale	pink	NA	male	Ryloth	Twilek
Ayla Secura	55.0	none	blue	hazel	48.0	female	Ryloth	Twilek
Dud Bolt	45.0	none	blue, grey	yellow	NA	male	Vulpter	Vulptereen
Gasgano	NA	none	white, blue	black	NA	male	Troiken	Xexto
Ben Quadinaros	65.0	none	grey, green, yellow	orange	NA	male	Tund	Toong
Mace Windu	84.0	none	dark	brown	72.0	male	Haruun Kal	Human
Ki-Adi-Mundi	82.0	white	pale	yellow	92.0	male	Cerea	Cerean
Kit Fisto	87.0	none	green	black	NA	male	Glee Anselm	Nautolan
Eeth Koth	NA	black	brown	brown	NA	male	Iridonia	Zabrak
Adi Gallia	50.0	none	dark	blue	NA	female	Coruscant	Tholothian
Saesee Tiin	NA	none	pale	orange	NA	male	Iktotch	Iktotchi
Yarael Poof	NA	none	white	yellow	NA	male	Quermia	Quermian
Plo Koon	80.0	none	orange	black	22.0	male	Dorin	Kel Dor
Mas Amedda	NA	none	blue	blue	NA	male	Champala	Chagrian
Gregar Typho	85.0	black	dark	brown	NA	male	Naboo	Human
Cordé	NA	brown	light	brown	NA	female	Naboo	Human
Cliegg Lars	NA	brown	fair	blue	82.0	male	Tatooine	Human
Poggle the Lesser	80.0	none	green	yellow	NA	male	Geonosis	Geonosian
Luminara Unduli	56.2	black	yellow	blue	58.0	female	Mirial	Mirialan

name	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species
Barriss Offee	50.0	black	yellow	blue	40.0	female	Mirial	Mirialan
Dormé	NA	brown	light	brown	NA	female	Naboo	Human
Dooku	80.0	white	fair	brown	102.0	male	Serenno	Human
Bail Prestor Organa	NA	black	tan	brown	67.0	male	Alderaan	Human
Jango Fett	79.0	black	tan	brown	66.0	male	Concord Dawn	Human
Zam Wesell	55.0	blonde	fair, green, yellow	yellow	NA	female	Zolan	Clawdite
Dexter Jettster	102.0	none	brown	yellow	NA	male	Ojom	Besalisk
Lama Su	88.0	none	grey	black	NA	male	Kamino	Kaminoan
Taun We	NA	none	grey	black	NA	female	Kamino	Kaminoan
Jocasta Nu	NA	white	fair	blue	NA	female	Coruscant	Human
Ratts Tyerell	15.0	none	grey, blue	unknown	NA	male	Aleen Minor	Aleena
R4-P17	NA	none	silver, red	red, blue	NA	female	NA	NA
Wat Tambor	48.0	none	green, grey	unknown	NA	male	Skako	Skakoan
San Hill	NA	none	grey	gold	NA	male	Muunilinst	Muun
Shaak Ti	57.0	none	red, blue, white	black	NA	female	Shili	Togruta
Grievous	159.0	none	brown, white	green, yellow	NA	male	Kalee	Kaleesh
Tarfful	136.0	brown	brown	blue	NA	male	Kashyyyk	Wookiee
Raymus Antilles	79.0	brown	light	brown	NA	male	Alderaan	Human
Sly Moore	48.0	none	pale	white	NA	female	Umbara	NA
Tion Medon	80.0	none	grey	black	NA	male	Utapau	Pau'an
Finn	NA	black	dark	dark	NA	male	NA	Human
Rey	NA	brown	light	hazel	NA	female	NA	Human
Poe Dameron	NA	brown	light	brown	NA	male	NA	Human
BB8	NA	none	none	black	NA	none	NA	Droid
Captain Phasma	NA	unknown	unknown	unknown	NA	female	NA	NA
Padmé Amidala	45.0	brown	light	brown	46.0	female	Naboo	Human

name	height	mass	hair_color	skin_color	eye_color	homeworld	species	films	vehicles	starships
Luke Skywalker	172	77.0	blond	fair	blue	Tatooine	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	c("Snowspeeder", "Imperial Speeder Bike")	c("X-wing", "Imperial shuttle")

name	height	mass	hair_color	skin_color	eye_color	homeworld	species	films	vehicles	starships
C-3PO	167	75.0	NA	gold	yellow	Tatooine	Droid	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope")	character(0)	character(0)
R2-D2	96	32.0	NA	white, blue	red	Naboo	Droid	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	character(0)	character(0)
Darth Vader	202	136.0	none	white	yellow	Tatooine	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope")	character(0)	TIE Advanced x1
Leia Organa	150	49.0	brown	light	brown	Alderaan	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	Imperial Speeder Bike	character(0)
Owen Lars	178	120.0	brown, grey	light	blue	Tatooine	Human	c("Attack of the Clones", "Revenge of the Sith", "A New Hope")	character(0)	character(0)
Beru Whitesun lars	165	75.0	brown	light	blue	Tatooine	Human	c("Attack of the Clones", "Revenge of the Sith", "A New Hope")	character(0)	character(0)

name	height	mass	hair_color	skin_color	eye_color	homeworld	species	films	vehicles	starships
R5-D4	97	32.0	NA	white, red	red	Tatooine	Droid	A New Hope	character(0)	character(0)
Biggs Darklighter	183	84.0	black	light	brown	Tatooine	Human	A New Hope	character(0)	X-wing
Obi-Wan Kenobi	182	77.0	auburn, white	fair	blue-gray	Stewjon	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope")	Tribubble bongo	c("Jedi starfighter", "Trade Federation cruiser", "Naboo star skiff", "Jedi Interceptor", "Belbullab-22 starfighter")
Anakin Skywalker	188	84.0	blond	fair	blue	Tatooine	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	c("Zephyr-G swoop bike", "XJ-6 airspeeder")	c("Trade Federation cruiser", "Jedi Interceptor", "Naboo fighter")
Wilhuff Tarkin	180	NA	auburn, grey	fair	blue	Eriadu	Human	c("Revenge of the Sith", "A New Hope")	character(0)	character(0)
Chewbacca	228	112.0	brown	unknown	blue	Kashyyyk	Wookiee	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	AT-ST	c("Millennium Falcon", "Imperial shuttle")
Han Solo	180	80.0	brown	fair	brown	Corellia	Human	c("Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	character(0)	c("Millennium Falcon", "Imperial shuttle")
Greedo	173	74.0	NA	green	black	Rodia	Rodian	A New Hope	character(0)	character(0)
Jabba Desilijic Tiure	175	1358.0	NA	green-tan, brown	orange	Nal Hutta	Hutt	c("The Phantom Menace", "Return of the Jedi", "A New Hope")	character(0)	character(0)

name	height	mass	hair_color	skin_color	eye_color	homeworld	species	films	vehicles	starships
Wedge Antilles	170	77.0	brown	fair	hazel	Corellia	Human	c("Return of the Jedi", "The Empire Strikes Back", "A New Hope")	Snowspeeder	X-wing
Jek Tono Porkins	180	110.0	brown	fair	blue	Bestine IV	Human	A New Hope	character(0)	X-wing
Yoda	66	17.0	white	green	brown	NA	Yoda's species	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back")	character(0)	character(0)
Palpatine	170	75.0	grey	pale	yellow	Naboo	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back")	character(0)	character(0)
Boba Fett	183	78.2	black	fair	brown	Kamino	Human	c("Attack of the Clones", "Return of the Jedi", "The Empire Strikes Back")	character(0)	Slave 1
IG-88	200	140.0	none	metal	red	NA	Droid	The Empire Strikes Back	character(0)	character(0)
Bossk	190	113.0	none	green	red	Trandosha	Trandoshan	The Empire Strikes Back	character(0)	character(0)
Lando Calrissian	177	79.0	black	dark	brown	Socorro	Human	c("Return of the Jedi", "The Empire Strikes Back")	character(0)	Millennium Falcon
Lobot	175	79.0	none	light	blue	Bespin	Human	The Empire Strikes Back	character(0)	character(0)
Ackbar	180	83.0	none	brown mottle	orange	Mon Cala	Mon Calamari	c("Return of the Jedi", "The Force Awakens")	character(0)	character(0)

name	height	mass	hair_color	skin_color	eye_color	homeworld	species	films	vehicles	starships
Mon Mothma	150	NA	auburn	fair	blue	Chandрила	Human	Return of the Jedi	character(0)	character(0)
Arvel Crynyd	NA	NA	brown	fair	brown	NA	Human	Return of the Jedi	character(0)	A-wing
Wicket Systri Warrick	88	20.0	brown	brown	brown	Endor	Ewok	Return of the Jedi	character(0)	character(0)
Nien Nunb	160	68.0	none	grey	black	Sullust	Sullustan	Return of the Jedi	character(0)	Millennium Falcon
Qui-Gon Jinn	193	89.0	brown	fair	blue	NA	Human	The Phantom Menace	Tribubble bongo	character(0)
Nute Gunray	191	90.0	none	mottled green	red	Cato Neimoidia	Neimodian	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	character(0)	character(0)
Finis Valorum	170	NA	blond	fair	blue	Coruscant	Human	The Phantom Menace	character(0)	character(0)
Jar Jar Binks	196	66.0	none	orange	orange	Naboo	Gungan	c("Attack of the Clones", "The Phantom Menace")	character(0)	character(0)
Roos Tarpals	224	82.0	none	grey	orange	Naboo	Gungan	The Phantom Menace	character(0)	character(0)
Rugor Nass	206	NA	none	green	orange	Naboo	Gungan	The Phantom Menace	character(0)	character(0)
Ric Olié	183	NA	brown	fair	blue	Naboo	NA	The Phantom Menace	character(0)	Naboo Royal Starship
Watto	137	NA	black	blue, grey	yellow	Toydaria	Toydarian	c("Attack of the Clones", "The Phantom Menace")	character(0)	character(0)
Sebulba	112	40.0	none	grey, red	orange	Malastare	Dug	The Phantom Menace	character(0)	character(0)
Quarsh Panaka	183	NA	black	dark	brown	Naboo	NA	The Phantom Menace	character(0)	character(0)
Shmi Skywalker	163	NA	black	fair	brown	Tatooine	Human	c("Attack of the Clones", "The Phantom Menace")	character(0)	character(0)
Darth Maul	175	80.0	none	red	yellow	Dathomir	Zabrak	The Phantom Menace	Sith speeder	Scimitar
Bib Fortuna	180	NA	none	pale	pink	Ryloth	Twilek	Return of the Jedi	character(0)	character(0)

name	height	mass	hair_color	skin_color	eye_color	homeworld	species	films	vehicles	starships
Ayla Secura	178	55.0	none	blue	hazel	Ryloth	Twilek	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	character(0)	character(0)
Dud Bolt	94	45.0	none	blue, grey	yellow	Vulpter	Vulptereen	The Phantom Menace	character(0)	character(0)
Gasgano	122	NA	none	white, blue	black	Troiken	Xexto	The Phantom Menace	character(0)	character(0)
Ben Quadinaros	163	65.0	none	grey, green, yellow	orange	Tund	Toong	The Phantom Menace	character(0)	character(0)
Mace Windu	188	84.0	none	dark	brown	Haruun Kal	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	character(0)	character(0)
Ki-Adi-Mundi	198	82.0	white	pale	yellow	Cerea	Cerean	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	character(0)	character(0)
Kit Fisto	196	87.0	none	green	black	Glee Anselm	Nautolan	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	character(0)	character(0)
Eeth Koth	171	NA	black	brown	brown	Iridonia	Zabrak	c("The Phantom Menace", "Revenge of the Sith")	character(0)	character(0)
Adi Gallia	184	50.0	none	dark	blue	Coruscant	Tholothian	c("The Phantom Menace", "Revenge of the Sith")	character(0)	character(0)
Saesee Tiin	188	NA	none	pale	orange	Iktotch	Iktotchi	c("The Phantom Menace", "Revenge of the Sith")	character(0)	character(0)
Yarael Poof	264	NA	none	white	yellow	Quermia	Quermian	The Phantom Menace	character(0)	character(0)

name	height	mass	hair_color	skin_color	eye_color	homeworld	species	films	vehicles	starships
Plo Koon	188	80.0	none	orange	black	Dorin	Kel Dor	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	character(0)	Jedi starfighter
Mas Amedda	196	NA	none	blue	blue	Champala	Chagrian	c("Attack of the Clones", "The Phantom Menace")	character(0)	character(0)
Gregar Typho	185	85.0	black	dark	brown	Naboo	Human	Attack of the Clones	character(0)	Naboo fighter
Cordé	157	NA	brown	light	brown	Naboo	Human	Attack of the Clones	character(0)	character(0)
Cliegg Lars	183	NA	brown	fair	blue	Tatooine	Human	Attack of the Clones	character(0)	character(0)
Poggle the Lesser	183	80.0	none	green	yellow	Geonosis	Geonosian	c("Attack of the Clones", "Revenge of the Sith")	character(0)	character(0)
Luminara Unduli	170	56.2	black	yellow	blue	Mirial	Mirialan	c("Attack of the Clones", "Revenge of the Sith")	character(0)	character(0)
Barriss Offee	166	50.0	black	yellow	blue	Mirial	Mirialan	Attack of the Clones	character(0)	character(0)
Dormé	165	NA	brown	light	brown	Naboo	Human	Attack of the Clones	character(0)	character(0)
Dooku	193	80.0	white	fair	brown	Serenno	Human	c("Attack of the Clones", "Revenge of the Sith")	Flitknot speeder	character(0)
Bail Prestor Organa	191	NA	black	tan	brown	Alderaan	Human	c("Attack of the Clones", "Revenge of the Sith")	character(0)	character(0)
Jango Fett	183	79.0	black	tan	brown	Concord Dawn	Human	Attack of the Clones	character(0)	character(0)
Zam Wesell	168	55.0	blonde	fair, green, yellow	yellow	Zolan	Clawdite	Attack of the Clones	Koro-2 Exodrive airspeeder	character(0)
Dexter Jettster	198	102.0	none	brown	yellow	Ojom	Besalisk	Attack of the Clones	character(0)	character(0)
Lama Su	229	88.0	none	grey	black	Kamino	Kaminoan	Attack of the Clones	character(0)	character(0)
Taun We	213	NA	none	grey	black	Kamino	Kaminoan	Attack of the Clones	character(0)	character(0)
Jocasta Nu	167	NA	white	fair	blue	Coruscant	Human	Attack of the Clones	character(0)	character(0)
Ratts Tyerell	79	15.0	none	grey, blue	unknown	Aleen Minor	Aleena	The Phantom Menace	character(0)	character(0)

name	height	mass	hair_color	skin_color	eye_color	homeworld	species	films	vehicles	starships
R4-P17	96	NA	none	silver, red	red, blue	NA	NA	c("Attack of the Clones", "Revenge of the Sith")	character(0)	character(0)
Wat Tambor	193	48.0	none	green, grey	unknown	Skako	Skakoan	Attack of the Clones	character(0)	character(0)
San Hill	191	NA	none	grey	gold	Muunilinst	Muun	Attack of the Clones	character(0)	character(0)
Shaak Ti	178	57.0	none	red, blue, white	black	Shili	Togruta	c("Attack of the Clones", "Revenge of the Sith")	character(0)	character(0)
Grievous	216	159.0	none	brown, white	green, yellow	Kalee	Kaleesh	Revenge of the Sith	Tsmeu-6 personal wheel bike	Belbullab-22 starfighter
Tarfful	234	136.0	brown	brown	blue	Kashyyyk	Wookiee	Revenge of the Sith	character(0)	character(0)
Raymus Antilles	188	79.0	brown	light	brown	Alderaan	Human	c("Revenge of the Sith", "A New Hope")	character(0)	character(0)
Sly Moore	178	48.0	none	pale	white	Umbara	NA	c("Attack of the Clones", "Revenge of the Sith")	character(0)	character(0)
Tion Medon	206	80.0	none	grey	black	Utapau	Pau'an	Revenge of the Sith	character(0)	character(0)
Finn	NA	NA	black	dark	dark	NA	Human	The Force Awakens	character(0)	character(0)
Rey	NA	NA	brown	light	hazel	NA	Human	The Force Awakens	character(0)	character(0)
Poe Dameron	NA	NA	brown	light	brown	NA	Human	The Force Awakens	character(0)	T-70 X-wing fighter
BB8	NA	NA	none	none	black	NA	Droid	The Force Awakens	character(0)	character(0)
Captain Phasma	NA	NA	unknown	unknown	unknown	NA	NA	The Force Awakens	character(0)	character(0)
Padmé Amidala	165	45.0	brown	light	brown	Naboo	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	character(0)	c("H-type Nubian yacht", "Naboo star skiff", "Naboo fighter")

Selecting Observations

The filter function allows you to limit your dataset to observations (rows) meeting a specific criteria. Multiple criteria can be combined with the & (AND) and | (OR) symbols.

```
library(dplyr)

# select females
newdata = filter(starwars, gender == "female")

# select females that are from Alderaan
newdata = filter(starwars, gender == "female" & homeworld == "Alderaan")

# select individuals that are from Alderaan, Coruscant, or Endor
```

```
newdata = filter(starwars, homeworld == "Alderaan" | homeworld == "Coruscant" |
  homeworld == "Endor")

# this can be written more succinctly as
newdata = filter(starwars, homeworld %in% c("Alderaan", "Coruscant", "Endor"))
newdata
```

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehicles	star:
Leia Organa	150	49	brown	light	brown	19	female	Alderaan	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	Imperial Speeder Bike	char
Wicket Systri Warrick	88	20	brown	brown	brown	8	male	Endor	Ewok	Return of the Jedi	character(0)	char
Finis Valorum	170	NA	blond	fair	blue	91	male	Coruscant	Human	The Phantom Menace	character(0)	char
Adi Gallia	184	50	none	dark	blue	NA	female	Coruscant	Tholothian	c("The Phantom Menace", "Revenge of the Sith")	character(0)	char
Bail Prestor Organa	191	NA	black	tan	brown	67	male	Alderaan	Human	c("Attack of the Clones", "Revenge of the Sith")	character(0)	char
Jocasta Nu	167	NA	white	fair	blue	NA	female	Coruscant	Human	Attack of the Clones	character(0)	char
Raymus Antilles	188	79	brown	light	brown	NA	male	Alderaan	Human	c("Revenge of the Sith", "A New Hope")	character(0)	char

Creating/Recoding variables

The mutate function allows you to create new variables or transform existing ones.

```
library(dplyr)

# convert height in centimeters to inches, and mass in kilograms to pounds
newdata <- mutate(starwars, height = height * 0.394, mass = mass * 2.205)
newdata
```

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	v
Luke Skywalker	67.768	169.785	blond	fair	blue	19.0	male	Tatooine	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	v
C-3PO	65.798	165.375	NA	gold	yellow	112.0	NA	Tatooine	Droid	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope")	c
R2-D2	37.824	70.560	NA	white, blue	red	33.0	NA	Naboo	Droid	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	c
Darth Vader	79.588	299.880	none	white	yellow	41.9	male	Tatooine	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope")	c
Leia Organa	59.100	108.045	brown	light	brown	19.0	female	Alderaan	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	I E
Owen Lars	70.132	264.600	brown, grey	light	blue	52.0	male	Tatooine	Human	c("Attack of the Clones", "Revenge of the Sith", "A New Hope")	c
Beru Whitesun lars	65.010	165.375	brown	light	blue	47.0	female	Tatooine	Human	c("Attack of the Clones", "Revenge of the Sith", "A New Hope")	c

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	
R5-D4	38.218	70.560	NA	white, red	red	NA	NA	Tatooine	Droid	A New Hope	c
Biggs Darklighter	72.102	185.220	black	light	brown	24.0	male	Tatooine	Human	A New Hope	c
Obi-Wan Kenobi	71.708	169.785	auburn, white	fair	blue-gray	57.0	male	Stewjon	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope")	1
Anakin Skywalker	74.072	185.220	blond	fair	blue	41.9	male	Tatooine	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	c
Wilhuff Tarkin	70.920	NA	auburn, grey	fair	blue	64.0	male	Eriadu	Human	c("Revenge of the Sith", "A New Hope")	c
Chewbacca	89.832	246.960	brown	unknown	blue	200.0	male	Kashyyyk	Wookiee	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	1
Han Solo	70.920	176.400	brown	fair	brown	29.0	male	Corellia	Human	c("Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	c
Greedo	68.162	163.170	NA	green	black	44.0	male	Rodia	Rodian	A New Hope	c
Jabba Desilijic Tiure	68.950	2994.390	NA	green-tan, brown	orange	600.0	hermaphrodite	Nal Hutta	Hutt	c("The Phantom Menace", "Return of the Jedi", "A New Hope")	c

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	v
Wedge Antilles	66.980	169.785	brown	fair	hazel	21.0	male	Corellia	Human	c("Return of the Jedi", "The Empire Strikes Back", "A New Hope")	s
Jek Tono Porkins	70.920	242.550	brown	fair	blue	NA	male	Bestine IV	Human	A New Hope	c
Yoda	26.004	37.485	white	green	brown	896.0	male	NA	Yoda's species	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back")	c
Palpatine	66.980	165.375	grey	pale	yellow	82.0	male	Naboo	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back")	c
Boba Fett	72.102	172.431	black	fair	brown	31.5	male	Kamino	Human	c("Attack of the Clones", "Return of the Jedi", "The Empire Strikes Back")	c
IG-88	78.800	308.700	none	metal	red	15.0	none	NA	Droid	The Empire Strikes Back	c
Bossk	74.860	249.165	none	green	red	53.0	male	Trandosha	Trandoshan	The Empire Strikes Back	c
Lando Calrissian	69.738	174.195	black	dark	brown	31.0	male	Socorro	Human	c("Return of the Jedi", "The Empire Strikes Back")	c
Lobot	68.950	174.195	none	light	blue	37.0	male	Bespin	Human	The Empire Strikes Back	c
Ackbar	70.920	183.015	none	brown mottle	orange	41.0	male	Mon Cala	Mon Calamari	c("Return of the Jedi", "The Force Awakens")	c

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	
Mon Mothma	59.100	NA	auburn	fair	blue	48.0	female	Chandрила	Human	Return of the Jedi	c
Arvel Crynyd	NA	NA	brown	fair	brown	NA	male	NA	Human	Return of the Jedi	c
Wicket Systri Warrick	34.672	44.100	brown	brown	brown	8.0	male	Endor	Ewok	Return of the Jedi	c
Nien Nunb	63.040	149.940	none	grey	black	NA	male	Sullust	Sullustan	Return of the Jedi	c
Qui-Gon Jinn	76.042	196.245	brown	fair	blue	92.0	male	NA	Human	The Phantom Menace	1
Nute Gunray	75.254	198.450	none	mottled green	red	NA	male	Cato Neimoidia	Neimodian	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	c
Finis Valorum	66.980	NA	blond	fair	blue	91.0	male	Coruscant	Human	The Phantom Menace	c
Jar Jar Binks	77.224	145.530	none	orange	orange	52.0	male	Naboo	Gungan	c("Attack of the Clones", "The Phantom Menace")	c
Roos Tarpals	88.256	180.810	none	grey	orange	NA	male	Naboo	Gungan	The Phantom Menace	c
Rugor Nass	81.164	NA	none	green	orange	NA	male	Naboo	Gungan	The Phantom Menace	c
Ric Olié	72.102	NA	brown	fair	blue	NA	male	Naboo	NA	The Phantom Menace	c
Watto	53.978	NA	black	blue, grey	yellow	NA	male	Toydaria	Toydarian	c("Attack of the Clones", "The Phantom Menace")	c
Sebulba	44.128	88.200	none	grey, red	orange	NA	male	Malastare	Dug	The Phantom Menace	c
Quarsh Panaka	72.102	NA	black	dark	brown	62.0	male	Naboo	NA	The Phantom Menace	c
Shmi Skywalker	64.222	NA	black	fair	brown	72.0	female	Tatooine	Human	c("Attack of the Clones", "The Phantom Menace")	c
Darth Maul	68.950	176.400	none	red	yellow	54.0	male	Dathomir	Zabrak	The Phantom Menace	s
Bib Fortuna	70.920	NA	none	pale	pink	NA	male	Ryloth	Twii'lek	Return of the Jedi	c

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	v
Ayla Secura	70.132	121.275	none	blue	hazel	48.0	female	Ryloth	Twilek	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	c
Dud Bolt	37.036	99.225	none	blue, grey	yellow	NA	male	Vulpter	Vulptereen	The Phantom Menace	c
Gasgano	48.068	NA	none	white, blue	black	NA	male	Troiken	Xexto	The Phantom Menace	c
Ben Quadinaros	64.222	143.325	none	grey, green, yellow	orange	NA	male	Tund	Toong	The Phantom Menace	c
Mace Windu	74.072	185.220	none	dark	brown	72.0	male	Haruun Kal	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	c
Ki-Adi-Mundi	78.012	180.810	white	pale	yellow	92.0	male	Cerea	Cerean	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	c
Kit Fisto	77.224	191.835	none	green	black	NA	male	Glee Anselm	Nautolan	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	c
Eeth Koth	67.374	NA	black	brown	brown	NA	male	Iridonia	Zabrak	c("The Phantom Menace", "Revenge of the Sith")	c
Adi Gallia	72.496	110.250	none	dark	blue	NA	female	Coruscant	Tholothian	c("The Phantom Menace", "Revenge of the Sith")	c
Saesee Tiin	74.072	NA	none	pale	orange	NA	male	Iktotch	Iktotchi	c("The Phantom Menace", "Revenge of the Sith")	c
Yarael Poof	104.016	NA	none	white	yellow	NA	male	Quermia	Quermian	The Phantom Menace	c

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	
Plo Koon	74.072	176.400	none	orange	black	22.0	male	Dorin	Kel Dor	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	c
Mas Amedda	77.224	NA	none	blue	blue	NA	male	Champala	Chagrian	c("Attack of the Clones", "The Phantom Menace")	c
Gregar Typho	72.890	187.425	black	dark	brown	NA	male	Naboo	Human	Attack of the Clones	c
Cordé	61.858	NA	brown	light	brown	NA	female	Naboo	Human	Attack of the Clones	c
Cliegg Lars	72.102	NA	brown	fair	blue	82.0	male	Tatooine	Human	Attack of the Clones	c
Poggle the Lesser	72.102	176.400	none	green	yellow	NA	male	Geonosis	Geonosian	c("Attack of the Clones", "Revenge of the Sith")	c
Luminara Unduli	66.980	123.921	black	yellow	blue	58.0	female	Mirial	Mirialan	c("Attack of the Clones", "Revenge of the Sith")	c
Barriss Offee	65.404	110.250	black	yellow	blue	40.0	female	Mirial	Mirialan	Attack of the Clones	c
Dormé	65.010	NA	brown	light	brown	NA	female	Naboo	Human	Attack of the Clones	c
Dooku	76.042	176.400	white	fair	brown	102.0	male	Serenno	Human	c("Attack of the Clones", "Revenge of the Sith")	F
Bail Prestor Organa	75.254	NA	black	tan	brown	67.0	male	Alderaan	Human	c("Attack of the Clones", "Revenge of the Sith")	c
Jango Fett	72.102	174.195	black	tan	brown	66.0	male	Concord Dawn	Human	Attack of the Clones	c
Zam Wesell	66.192	121.275	blonde	fair, green, yellow	yellow	NA	female	Zolan	Clawdite	Attack of the Clones	h a
Dexter Jettster	78.012	224.910	none	brown	yellow	NA	male	Ojom	Besalisk	Attack of the Clones	c
Lama Su	90.226	194.040	none	grey	black	NA	male	Kamino	Kaminoan	Attack of the Clones	c
Taun We	83.922	NA	none	grey	black	NA	female	Kamino	Kaminoan	Attack of the Clones	c
Jocasta Nu	65.798	NA	white	fair	blue	NA	female	Coruscant	Human	Attack of the Clones	c
Ratts Tyerell	31.126	33.075	none	grey, blue	unknown	NA	male	Aleen Minor	Aleena	The Phantom Menace	c

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	
R4-P17	37.824	NA	none	silver, red	red, blue	NA	female	NA	NA	c("Attack of the Clones", "Revenge of the Sith")	c
Wat Tambor	76.042	105.840	none	green, grey	unknown	NA	male	Skako	Skakoan	Attack of the Clones	c
San Hill	75.254	NA	none	grey	gold	NA	male	Muunilinst	Muun	Attack of the Clones	c
Shaak Ti	70.132	125.685	none	red, blue, white	black	NA	female	Shili	Togruta	c("Attack of the Clones", "Revenge of the Sith")	c
Grievous	85.104	350.595	none	brown, white	green, yellow	NA	male	Kalee	Kaleesh	Revenge of the Sith	T f t
Tarfful	92.196	299.880	brown	brown	blue	NA	male	Kashyyyk	Wookiee	Revenge of the Sith	c
Raymus Antilles	74.072	174.195	brown	light	brown	NA	male	Alderaan	Human	c("Revenge of the Sith", "A New Hope")	c
Sly Moore	70.132	105.840	none	pale	white	NA	female	Umbara	NA	c("Attack of the Clones", "Revenge of the Sith")	c
Tion Medon	81.164	176.400	none	grey	black	NA	male	Utapau	Pau'an	Revenge of the Sith	c
Finn	NA	NA	black	dark	dark	NA	male	NA	Human	The Force Awakens	c
Rey	NA	NA	brown	light	hazel	NA	female	NA	Human	The Force Awakens	c
Poe Dameron	NA	NA	brown	light	brown	NA	male	NA	Human	The Force Awakens	c
BB8	NA	NA	none	none	black	NA	none	NA	Droid	The Force Awakens	c
Captain Phasma	NA	NA	unknown	unknown	unknown	NA	female	NA	NA	The Force Awakens	c
Padmé Amidala	65.010	99.225	brown	light	brown	46.0	female	Naboo	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	c

The ifelse function (part of base R) can be used for recoding data. The format is ifelse(test, return if TRUE, return if FALSE).

```
library(dplyr)

# if height is greater than 180 then heightcat = 'tall', otherwise heightcat
# = 'short'

newdata = mutate(starwars, heightcat = ifelse(height > 180, "tall", "short"))
newdata
# convert any eye color that is not black, blue or brown, to other
newdata = mutate(starwars, eye_color = ifelse(eye_color %in% c("black", "blue",
  "brown"), eye_color, "other"))
newdata
# set heights greater than 200 or less than 75 to missing
```

```
newdata = mutate(starwars, height = ifelse(height < 75 | height > 200, NA, height))
newdata
```

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Luke Skywalker	172	77.0	blond	fair	blue	19.0	male	Tatooine	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	c("Sr "Imp Spee
C-3PO	167	75.0	NA	gold	yellow	112.0	NA	Tatooine	Droid	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope")	char
R2-D2	96	32.0	NA	white, blue	red	33.0	NA	Naboo	Droid	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	char
Darth Vader	202	136.0	none	white	yellow	41.9	male	Tatooine	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope")	char
Leia Organa	150	49.0	brown	light	brown	19.0	female	Alderaan	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	Imp Bike

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Owen Lars	178	120.0	brown, grey	light	blue	52.0	male	Tatooine	Human	c("Attack of the Clones", "Revenge of the Sith", "A New Hope")	char
Beru Whitesun lars	165	75.0	brown	light	blue	47.0	female	Tatooine	Human	c("Attack of the Clones", "Revenge of the Sith", "A New Hope")	char
R5-D4	97	32.0	NA	white, red	red	NA	NA	Tatooine	Droid	A New Hope	char
Biggs Darklighter	183	84.0	black	light	brown	24.0	male	Tatooine	Human	A New Hope	char
Obi-Wan Kenobi	182	77.0	auburn, white	fair	blue-gray	57.0	male	Stewjon	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope")	Tribu
Anakin Skywalker	188	84.0	blond	fair	blue	41.9	male	Tatooine	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	c("Zε swoi 6 air
Wilhuff Tarkin	180	NA	auburn, grey	fair	blue	64.0	male	Eriadu	Human	c("Revenge of the Sith", "A New Hope")	char
Chewbacca	228	112.0	brown	unknown	blue	200.0	male	Kashyyyk	Wookiee	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	AT-S
Han Solo	180	80.0	brown	fair	brown	29.0	male	Corellia	Human	c("Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Greedo	173	74.0	NA	green	black	44.0	male	Rodia	Rodian	A New Hope	char
Jabba Desilijic Tiure	175	1358.0	NA	green-tan, brown	orange	600.0	hermaphrodite	Nal Hutta	Hutt	c("The Phantom Menace", "Return of the Jedi", "A New Hope")	char
Wedge Antilles	170	77.0	brown	fair	hazel	21.0	male	Corellia	Human	c("Return of the Jedi", "The Empire Strikes Back", "A New Hope")	Snov
Jek Tono Porkins	180	110.0	brown	fair	blue	NA	male	Bestine IV	Human	A New Hope	char
Yoda	66	17.0	white	green	brown	896.0	male	NA	Yoda's species	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back")	char
Palpatine	170	75.0	grey	pale	yellow	82.0	male	Naboo	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back")	char
Boba Fett	183	78.2	black	fair	brown	31.5	male	Kamino	Human	c("Attack of the Clones", "Return of the Jedi", "The Empire Strikes Back")	char
IG-88	200	140.0	none	metal	red	15.0	none	NA	Droid	The Empire Strikes Back	char
Bossk	190	113.0	none	green	red	53.0	male	Trandosha	Trandoshan	The Empire Strikes Back	char
Lando Calrissian	177	79.0	black	dark	brown	31.0	male	Socorro	Human	c("Return of the Jedi", "The Empire Strikes Back")	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Lobot	175	79.0	none	light	blue	37.0	male	Bespin	Human	The Empire Strikes Back	char
Ackbar	180	83.0	none	brown mottle	orange	41.0	male	Mon Cala	Mon Calamari	c("Return of the Jedi", "The Force Awakens")	char
Mon Mothma	150	NA	auburn	fair	blue	48.0	female	Chandrila	Human	Return of the Jedi	char
Arvel Crynyd	NA	NA	brown	fair	brown	NA	male	NA	Human	Return of the Jedi	char
Wicket Systri Warrick	88	20.0	brown	brown	brown	8.0	male	Endor	Ewok	Return of the Jedi	char
Nien Nunb	160	68.0	none	grey	black	NA	male	Sullust	Sullustan	Return of the Jedi	char
Qui-Gon Jinn	193	89.0	brown	fair	blue	92.0	male	NA	Human	The Phantom Menace	Tribu
Nute Gunray	191	90.0	none	mottled green	red	NA	male	Cato Neimoidia	Neimodian	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Finis Valorum	170	NA	blond	fair	blue	91.0	male	Coruscant	Human	The Phantom Menace	char
Jar Jar Binks	196	66.0	none	orange	orange	52.0	male	Naboo	Gungan	c("Attack of the Clones", "The Phantom Menace")	char
Roos Tarpals	224	82.0	none	grey	orange	NA	male	Naboo	Gungan	The Phantom Menace	char
Rugor Nass	206	NA	none	green	orange	NA	male	Naboo	Gungan	The Phantom Menace	char
Ric Olié	183	NA	brown	fair	blue	NA	male	Naboo	NA	The Phantom Menace	char
Watto	137	NA	black	blue, grey	yellow	NA	male	Toydaria	Toydarian	c("Attack of the Clones", "The Phantom Menace")	char
Sebulba	112	40.0	none	grey, red	orange	NA	male	Malastare	Dug	The Phantom Menace	char
Quarsh Panaka	183	NA	black	dark	brown	62.0	male	Naboo	NA	The Phantom Menace	char
Shmi Skywalker	163	NA	black	fair	brown	72.0	female	Tatooine	Human	c("Attack of the Clones", "The Phantom Menace")	char
Darth Maul	175	80.0	none	red	yellow	54.0	male	Dathomir	Zabrak	The Phantom Menace	Sith

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Bib Fortuna	180	NA	none	pale	pink	NA	male	Ryloth	Twilek	Return of the Jedi	char
Ayla Secura	178	55.0	none	blue	hazel	48.0	female	Ryloth	Twilek	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Dud Bolt	94	45.0	none	blue, grey	yellow	NA	male	Vulpter	Vulptereen	The Phantom Menace	char
Gasgano	122	NA	none	white, blue	black	NA	male	Troiken	Xexto	The Phantom Menace	char
Ben Quadinaros	163	65.0	none	grey, green, yellow	orange	NA	male	Tund	Toong	The Phantom Menace	char
Mace Windu	188	84.0	none	dark	brown	72.0	male	Haruun Kal	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Ki-Adi-Mundi	198	82.0	white	pale	yellow	92.0	male	Cerea	Cerean	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Kit Fisto	196	87.0	none	green	black	NA	male	Glee Anselm	Nautolan	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Eeth Koth	171	NA	black	brown	brown	NA	male	Iridonia	Zabrak	c("The Phantom Menace", "Revenge of the Sith")	char
Adi Gallia	184	50.0	none	dark	blue	NA	female	Coruscant	Tholothian	c("The Phantom Menace", "Revenge of the Sith")	char
Saesee Tiin	188	NA	none	pale	orange	NA	male	Iktotch	Iktotchi	c("The Phantom Menace", "Revenge of the Sith")	char
Yarael Poof	264	NA	none	white	yellow	NA	male	Quermia	Quermian	The Phantom Menace	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Plo Koon	188	80.0	none	orange	black	22.0	male	Dorin	Kel Dor	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Mas Amedda	196	NA	none	blue	blue	NA	male	Champala	Chagrian	c("Attack of the Clones", "The Phantom Menace")	char
Gregar Typho	185	85.0	black	dark	brown	NA	male	Naboo	Human	Attack of the Clones	char
Cordé	157	NA	brown	light	brown	NA	female	Naboo	Human	Attack of the Clones	char
Cliegg Lars	183	NA	brown	fair	blue	82.0	male	Tatooine	Human	Attack of the Clones	char
Poggle the Lesser	183	80.0	none	green	yellow	NA	male	Geonosis	Geonosian	c("Attack of the Clones", "Revenge of the Sith")	char
Luminara Unduli	170	56.2	black	yellow	blue	58.0	female	Mirial	Mirialan	c("Attack of the Clones", "Revenge of the Sith")	char
Barriss Offee	166	50.0	black	yellow	blue	40.0	female	Mirial	Mirialan	Attack of the Clones	char
Dormé	165	NA	brown	light	brown	NA	female	Naboo	Human	Attack of the Clones	char
Dooku	193	80.0	white	fair	brown	102.0	male	Serenno	Human	c("Attack of the Clones", "Revenge of the Sith")	Flitki
Bail Prestor Organa	191	NA	black	tan	brown	67.0	male	Alderaan	Human	c("Attack of the Clones", "Revenge of the Sith")	char
Jango Fett	183	79.0	black	tan	brown	66.0	male	Concord Dawn	Human	Attack of the Clones	char
Zam Wesell	168	55.0	blonde	fair, green, yellow	yellow	NA	female	Zolan	Clawdite	Attack of the Clones	Korcs
Dexter Jettster	198	102.0	none	brown	yellow	NA	male	Ojom	Besalisk	Attack of the Clones	char
Lama Su	229	88.0	none	grey	black	NA	male	Kamino	Kaminoan	Attack of the Clones	char
Taun We	213	NA	none	grey	black	NA	female	Kamino	Kaminoan	Attack of the Clones	char
Jocasta Nu	167	NA	white	fair	blue	NA	female	Coruscant	Human	Attack of the Clones	char
Ratts Tyerell	79	15.0	none	grey, blue	unknown	NA	male	Aleen Minor	Aleena	The Phantom Menace	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
R4-P17	96	NA	none	silver, red	red, blue	NA	female	NA	NA	c("Attack of the Clones", "Revenge of the Sith")	char
Wat Tambor	193	48.0	none	green, grey	unknown	NA	male	Skako	Skakoan	Attack of the Clones	char
San Hill	191	NA	none	grey	gold	NA	male	Muunilinst	Muun	Attack of the Clones	char
Shaak Ti	178	57.0	none	red, blue, white	black	NA	female	Shili	Togruta	c("Attack of the Clones", "Revenge of the Sith")	char
Grievous	216	159.0	none	brown, white	green, yellow	NA	male	Kalee	Kaleesh	Revenge of the Sith	Tsm pers bike
Tarfful	234	136.0	brown	brown	blue	NA	male	Kashyyyk	Wookiee	Revenge of the Sith	char
Raymus Antilles	188	79.0	brown	light	brown	NA	male	Alderaan	Human	c("Revenge of the Sith", "A New Hope")	char
Sly Moore	178	48.0	none	pale	white	NA	female	Umbara	NA	c("Attack of the Clones", "Revenge of the Sith")	char
Tion Medon	206	80.0	none	grey	black	NA	male	Utapau	Pau'an	Revenge of the Sith	char
Finn	NA	NA	black	dark	dark	NA	male	NA	Human	The Force Awakens	char
Rey	NA	NA	brown	light	hazel	NA	female	NA	Human	The Force Awakens	char
Poe Dameron	NA	NA	brown	light	brown	NA	male	NA	Human	The Force Awakens	char
BB8	NA	NA	none	none	black	NA	none	NA	Droid	The Force Awakens	char
Captain Phasma	NA	NA	unknown	unknown	unknown	NA	female	NA	NA	The Force Awakens	char
Padmé Amidala	165	45.0	brown	light	brown	46.0	female	Naboo	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Luke Skywalker	172	77.0	blond	fair	blue	19.0	male	Tatooine	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	c("Sr "Imp Spee

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
C-3PO	167	75.0	NA	gold	other	112.0	NA	Tatooine	Droid	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope")	char
R2-D2	96	32.0	NA	white, blue	other	33.0	NA	Naboo	Droid	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	char
Darth Vader	202	136.0	none	white	other	41.9	male	Tatooine	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope")	char
Leia Organa	150	49.0	brown	light	brown	19.0	female	Alderaan	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	Imp Bike
Owen Lars	178	120.0	brown, grey	light	blue	52.0	male	Tatooine	Human	c("Attack of the Clones", "Revenge of the Sith", "A New Hope")	char
Beru Whitesun lars	165	75.0	brown	light	blue	47.0	female	Tatooine	Human	c("Attack of the Clones", "Revenge of the Sith", "A New Hope")	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
R5-D4	97	32.0	NA	white, red	other	NA	NA	Tatooine	Droid	A New Hope	char
Biggs Darklighter	183	84.0	black	light	brown	24.0	male	Tatooine	Human	A New Hope	char
Obi-Wan Kenobi	182	77.0	auburn, white	fair	other	57.0	male	Stewjon	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope")	Tribu
Anakin Skywalker	188	84.0	blond	fair	blue	41.9	male	Tatooine	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	c("Zε swor 6 air
Wilhuff Tarkin	180	NA	auburn, grey	fair	blue	64.0	male	Eriadu	Human	c("Revenge of the Sith", "A New Hope")	char
Chewbacca	228	112.0	brown	unknown	blue	200.0	male	Kashyyyk	Wookiee	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	AT-S
Han Solo	180	80.0	brown	fair	brown	29.0	male	Corellia	Human	c("Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	char
Greedo	173	74.0	NA	green	black	44.0	male	Rodia	Rodian	A New Hope	char
Jabba Desilijic Tiure	175	1358.0	NA	green-tan, brown	other	600.0	hermaphrodite	Nal Hutta	Hutt	c("The Phantom Menace", "Return of the Jedi", "A New Hope")	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Wedge Antilles	170	77.0	brown	fair	other	21.0	male	Corellia	Human	c("Return of the Jedi", "The Empire Strikes Back", "A New Hope")	Snow
Jek Tono Porkins	180	110.0	brown	fair	blue	NA	male	Bestine IV	Human	A New Hope	char
Yoda	66	17.0	white	green	brown	896.0	male	NA	Yoda's species	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back")	char
Palpatine	170	75.0	grey	pale	other	82.0	male	Naboo	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back")	char
Boba Fett	183	78.2	black	fair	brown	31.5	male	Kamino	Human	c("Attack of the Clones", "Return of the Jedi", "The Empire Strikes Back")	char
IG-88	200	140.0	none	metal	other	15.0	none	NA	Droid	The Empire Strikes Back	char
Bossk	190	113.0	none	green	other	53.0	male	Trandosha	Trandoshan	The Empire Strikes Back	char
Lando Calrissian	177	79.0	black	dark	brown	31.0	male	Socorro	Human	c("Return of the Jedi", "The Empire Strikes Back")	char
Lobot	175	79.0	none	light	blue	37.0	male	Bespin	Human	The Empire Strikes Back	char
Ackbar	180	83.0	none	brown mottle	other	41.0	male	Mon Cala	Mon Calamari	c("Return of the Jedi", "The Force Awakens")	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Mon Mothma	150	NA	auburn	fair	blue	48.0	female	Chandрила	Human	Return of the Jedi	char
Arvel Crynyd	NA	NA	brown	fair	brown	NA	male	NA	Human	Return of the Jedi	char
Wicket Systri Warrick	88	20.0	brown	brown	brown	8.0	male	Endor	Ewok	Return of the Jedi	char
Nien Nunb	160	68.0	none	grey	black	NA	male	Sullust	Sullustan	Return of the Jedi	char
Qui-Gon Jinn	193	89.0	brown	fair	blue	92.0	male	NA	Human	The Phantom Menace	Tribu
Nute Gunray	191	90.0	none	mottled green	other	NA	male	Cato Neimoidia	Neimodian	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Finis Valorum	170	NA	blond	fair	blue	91.0	male	Coruscant	Human	The Phantom Menace	char
Jar Jar Binks	196	66.0	none	orange	other	52.0	male	Naboo	Gungan	c("Attack of the Clones", "The Phantom Menace")	char
Roos Tarpals	224	82.0	none	grey	other	NA	male	Naboo	Gungan	The Phantom Menace	char
Rugor Nass	206	NA	none	green	other	NA	male	Naboo	Gungan	The Phantom Menace	char
Ric Olié	183	NA	brown	fair	blue	NA	male	Naboo	NA	The Phantom Menace	char
Watto	137	NA	black	blue, grey	other	NA	male	Toydaria	Toydarian	c("Attack of the Clones", "The Phantom Menace")	char
Sebulba	112	40.0	none	grey, red	other	NA	male	Malastare	Dug	The Phantom Menace	char
Quarsh Panaka	183	NA	black	dark	brown	62.0	male	Naboo	NA	The Phantom Menace	char
Shmi Skywalker	163	NA	black	fair	brown	72.0	female	Tatooine	Human	c("Attack of the Clones", "The Phantom Menace")	char
Darth Maul	175	80.0	none	red	other	54.0	male	Dathomir	Zabrak	The Phantom Menace	Sith
Bib Fortuna	180	NA	none	pale	other	NA	male	Ryloth	Twii'lek	Return of the Jedi	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Ayla Secura	178	55.0	none	blue	other	48.0	female	Ryloth	Twilek	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Dud Bolt	94	45.0	none	blue, grey	other	NA	male	Vulpter	Vulptereen	The Phantom Menace	char
Gasgano	122	NA	none	white, blue	black	NA	male	Troiken	Xexto	The Phantom Menace	char
Ben Quadinaros	163	65.0	none	grey, green, yellow	other	NA	male	Tund	Toong	The Phantom Menace	char
Mace Windu	188	84.0	none	dark	brown	72.0	male	Haruun Kal	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Ki-Adi-Mundi	198	82.0	white	pale	other	92.0	male	Cerea	Cerean	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Kit Fisto	196	87.0	none	green	black	NA	male	Glee Anselm	Nautolan	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Eeth Koth	171	NA	black	brown	brown	NA	male	Iridonia	Zabrak	c("The Phantom Menace", "Revenge of the Sith")	char
Adi Gallia	184	50.0	none	dark	blue	NA	female	Coruscant	Tholothian	c("The Phantom Menace", "Revenge of the Sith")	char
Saesee Tiin	188	NA	none	pale	other	NA	male	Iktotch	Iktotchi	c("The Phantom Menace", "Revenge of the Sith")	char
Yarael Poof	264	NA	none	white	other	NA	male	Quermia	Quermian	The Phantom Menace	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Plo Koon	188	80.0	none	orange	black	22.0	male	Dorin	Kel Dor	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Mas Amedda	196	NA	none	blue	blue	NA	male	Champala	Chagrian	c("Attack of the Clones", "The Phantom Menace")	char
Gregar Typho	185	85.0	black	dark	brown	NA	male	Naboo	Human	Attack of the Clones	char
Cordé	157	NA	brown	light	brown	NA	female	Naboo	Human	Attack of the Clones	char
Cliegg Lars	183	NA	brown	fair	blue	82.0	male	Tatooine	Human	Attack of the Clones	char
Poggle the Lesser	183	80.0	none	green	other	NA	male	Geonosis	Geonosian	c("Attack of the Clones", "Revenge of the Sith")	char
Luminara Unduli	170	56.2	black	yellow	blue	58.0	female	Mirial	Mirialan	c("Attack of the Clones", "Revenge of the Sith")	char
Barriss Offee	166	50.0	black	yellow	blue	40.0	female	Mirial	Mirialan	Attack of the Clones	char
Dormé	165	NA	brown	light	brown	NA	female	Naboo	Human	Attack of the Clones	char
Dooku	193	80.0	white	fair	brown	102.0	male	Serenno	Human	c("Attack of the Clones", "Revenge of the Sith")	Flitki
Bail Prestor Organa	191	NA	black	tan	brown	67.0	male	Alderaan	Human	c("Attack of the Clones", "Revenge of the Sith")	char
Jango Fett	183	79.0	black	tan	brown	66.0	male	Concord Dawn	Human	Attack of the Clones	char
Zam Wesell	168	55.0	blonde	fair, green, yellow	other	NA	female	Zolan	Clawdite	Attack of the Clones	Korcsairs
Dexter Jettster	198	102.0	none	brown	other	NA	male	Ojom	Besalisk	Attack of the Clones	char
Lama Su	229	88.0	none	grey	black	NA	male	Kamino	Kaminoan	Attack of the Clones	char
Taun We	213	NA	none	grey	black	NA	female	Kamino	Kaminoan	Attack of the Clones	char
Jocasta Nu	167	NA	white	fair	blue	NA	female	Coruscant	Human	Attack of the Clones	char
Ratts Tyerell	79	15.0	none	grey, blue	other	NA	male	Aleen Minor	Aleena	The Phantom Menace	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
R4-P17	96	NA	none	silver, red	other	NA	female	NA	NA	c("Attack of the Clones", "Revenge of the Sith")	char
Wat Tambor	193	48.0	none	green, grey	other	NA	male	Skako	Skakoan	Attack of the Clones	char
San Hill	191	NA	none	grey	other	NA	male	Muunilinst	Muun	Attack of the Clones	char
Shaak Ti	178	57.0	none	red, blue, white	black	NA	female	Shili	Togruta	c("Attack of the Clones", "Revenge of the Sith")	char
Grievous	216	159.0	none	brown, white	other	NA	male	Kalee	Kaleesh	Revenge of the Sith	Tsm pers bike
Tarfful	234	136.0	brown	brown	blue	NA	male	Kashyyyk	Wookiee	Revenge of the Sith	char
Raymus Antilles	188	79.0	brown	light	brown	NA	male	Alderaan	Human	c("Revenge of the Sith", "A New Hope")	char
Sly Moore	178	48.0	none	pale	other	NA	female	Umbara	NA	c("Attack of the Clones", "Revenge of the Sith")	char
Tion Medon	206	80.0	none	grey	black	NA	male	Utapau	Pau'an	Revenge of the Sith	char
Finn	NA	NA	black	dark	other	NA	male	NA	Human	The Force Awakens	char
Rey	NA	NA	brown	light	other	NA	female	NA	Human	The Force Awakens	char
Poe Dameron	NA	NA	brown	light	brown	NA	male	NA	Human	The Force Awakens	char
BB8	NA	NA	none	none	black	NA	none	NA	Droid	The Force Awakens	char
Captain Phasma	NA	NA	unknown	unknown	other	NA	female	NA	NA	The Force Awakens	char
Padmé Amidala	165	45.0	brown	light	brown	46.0	female	Naboo	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Luke Skywalker	172	77.0	blond	fair	blue	19.0	male	Tatooine	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	c("Sr "Imp Spee

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
C-3PO	167	75.0	NA	gold	yellow	112.0	NA	Tatooine	Droid	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope")	char
R2-D2	96	32.0	NA	white, blue	red	33.0	NA	Naboo	Droid	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	char
Darth Vader	NA	136.0	none	white	yellow	41.9	male	Tatooine	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope")	char
Leia Organa	150	49.0	brown	light	brown	19.0	female	Alderaan	Human	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	Imp Bike
Owen Lars	178	120.0	brown, grey	light	blue	52.0	male	Tatooine	Human	c("Attack of the Clones", "Revenge of the Sith", "A New Hope")	char
Beru Whitesun lars	165	75.0	brown	light	blue	47.0	female	Tatooine	Human	c("Attack of the Clones", "Revenge of the Sith", "A New Hope")	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
R5-D4	97	32.0	NA	white, red	red	NA	NA	Tatooine	Droid	A New Hope	char
Biggs Darklighter	183	84.0	black	light	brown	24.0	male	Tatooine	Human	A New Hope	char
Obi-Wan Kenobi	182	77.0	auburn, white	fair	blue-gray	57.0	male	Stewjon	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope")	Tribu
Anakin Skywalker	188	84.0	blond	fair	blue	41.9	male	Tatooine	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	c("Zε swor 6 air
Wilhuff Tarkin	180	NA	auburn, grey	fair	blue	64.0	male	Eriadu	Human	c("Revenge of the Sith", "A New Hope")	char
Chewbacca	NA	112.0	brown	unknown	blue	200.0	male	Kashyyyk	Wookiee	c("Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	AT-S
Han Solo	180	80.0	brown	fair	brown	29.0	male	Corellia	Human	c("Return of the Jedi", "The Empire Strikes Back", "A New Hope", "The Force Awakens")	char
Greedo	173	74.0	NA	green	black	44.0	male	Rodia	Rodian	A New Hope	char
Jabba Desilijic Tiure	175	1358.0	NA	green-tan, brown	orange	600.0	hermaphrodite	Nal Hutta	Hutt	c("The Phantom Menace", "Return of the Jedi", "A New Hope")	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Wedge Antilles	170	77.0	brown	fair	hazel	21.0	male	Corellia	Human	c("Return of the Jedi", "The Empire Strikes Back", "A New Hope")	Snow
Jek Tono Porkins	180	110.0	brown	fair	blue	NA	male	Bestine IV	Human	A New Hope	char
Yoda	NA	17.0	white	green	brown	896.0	male	NA	Yoda's species	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back")	char
Palpatine	170	75.0	grey	pale	yellow	82.0	male	Naboo	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith", "Return of the Jedi", "The Empire Strikes Back")	char
Boba Fett	183	78.2	black	fair	brown	31.5	male	Kamino	Human	c("Attack of the Clones", "Return of the Jedi", "The Empire Strikes Back")	char
IG-88	200	140.0	none	metal	red	15.0	none	NA	Droid	The Empire Strikes Back	char
Bossk	190	113.0	none	green	red	53.0	male	Trandosha	Trandoshan	The Empire Strikes Back	char
Lando Calrissian	177	79.0	black	dark	brown	31.0	male	Socorro	Human	c("Return of the Jedi", "The Empire Strikes Back")	char
Lobot	175	79.0	none	light	blue	37.0	male	Bespin	Human	The Empire Strikes Back	char
Ackbar	180	83.0	none	brown mottle	orange	41.0	male	Mon Cala	Mon Calamari	c("Return of the Jedi", "The Force Awakens")	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Mon Mothma	150	NA	auburn	fair	blue	48.0	female	Chandрила	Human	Return of the Jedi	char
Arvel Crynyd	NA	NA	brown	fair	brown	NA	male	NA	Human	Return of the Jedi	char
Wicket Systri Warrick	88	20.0	brown	brown	brown	8.0	male	Endor	Ewok	Return of the Jedi	char
Nien Nunb	160	68.0	none	grey	black	NA	male	Sullust	Sullustan	Return of the Jedi	char
Qui-Gon Jinn	193	89.0	brown	fair	blue	92.0	male	NA	Human	The Phantom Menace	Tribu
Nute Gunray	191	90.0	none	mottled green	red	NA	male	Cato Neimoidia	Neimodian	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Finis Valorum	170	NA	blond	fair	blue	91.0	male	Coruscant	Human	The Phantom Menace	char
Jar Jar Binks	196	66.0	none	orange	orange	52.0	male	Naboo	Gungan	c("Attack of the Clones", "The Phantom Menace")	char
Roos Tarpals	NA	82.0	none	grey	orange	NA	male	Naboo	Gungan	The Phantom Menace	char
Rugor Nass	NA	NA	none	green	orange	NA	male	Naboo	Gungan	The Phantom Menace	char
Ric Olié	183	NA	brown	fair	blue	NA	male	Naboo	NA	The Phantom Menace	char
Watto	137	NA	black	blue, grey	yellow	NA	male	Toydaria	Toydarian	c("Attack of the Clones", "The Phantom Menace")	char
Sebulba	112	40.0	none	grey, red	orange	NA	male	Malastare	Dug	The Phantom Menace	char
Quarsh Panaka	183	NA	black	dark	brown	62.0	male	Naboo	NA	The Phantom Menace	char
Shmi Skywalker	163	NA	black	fair	brown	72.0	female	Tatooine	Human	c("Attack of the Clones", "The Phantom Menace")	char
Darth Maul	175	80.0	none	red	yellow	54.0	male	Dathomir	Zabrak	The Phantom Menace	Sith
Bib Fortuna	180	NA	none	pale	pink	NA	male	Ryloth	Twii'lek	Return of the Jedi	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Ayla Secura	178	55.0	none	blue	hazel	48.0	female	Ryloth	Twilek	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Dud Bolt	94	45.0	none	blue, grey	yellow	NA	male	Vulpter	Vulptereen	The Phantom Menace	char
Gasgano	122	NA	none	white, blue	black	NA	male	Troiken	Xexto	The Phantom Menace	char
Ben Quadinaros	163	65.0	none	grey, green, yellow	orange	NA	male	Tund	Toong	The Phantom Menace	char
Mace Windu	188	84.0	none	dark	brown	72.0	male	Haruun Kal	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Ki-Adi-Mundi	198	82.0	white	pale	yellow	92.0	male	Cerea	Cerean	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Kit Fisto	196	87.0	none	green	black	NA	male	Glee Anselm	Nautolan	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Eeth Koth	171	NA	black	brown	brown	NA	male	Iridonia	Zabrak	c("The Phantom Menace", "Revenge of the Sith")	char
Adi Gallia	184	50.0	none	dark	blue	NA	female	Coruscant	Tholothian	c("The Phantom Menace", "Revenge of the Sith")	char
Saesee Tiin	188	NA	none	pale	orange	NA	male	Iktotch	Iktotchi	c("The Phantom Menace", "Revenge of the Sith")	char
Yarael Poof	NA	NA	none	white	yellow	NA	male	Quermia	Quermian	The Phantom Menace	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
Plo Koon	188	80.0	none	orange	black	22.0	male	Dorin	Kel Dor	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char
Mas Amedda	196	NA	none	blue	blue	NA	male	Champala	Chagrian	c("Attack of the Clones", "The Phantom Menace")	char
Gregar Typho	185	85.0	black	dark	brown	NA	male	Naboo	Human	Attack of the Clones	char
Cordé	157	NA	brown	light	brown	NA	female	Naboo	Human	Attack of the Clones	char
Cliegg Lars	183	NA	brown	fair	blue	82.0	male	Tatooine	Human	Attack of the Clones	char
Poggle the Lesser	183	80.0	none	green	yellow	NA	male	Geonosis	Geonosian	c("Attack of the Clones", "Revenge of the Sith")	char
Luminara Unduli	170	56.2	black	yellow	blue	58.0	female	Mirial	Mirialan	c("Attack of the Clones", "Revenge of the Sith")	char
Barriss Offee	166	50.0	black	yellow	blue	40.0	female	Mirial	Mirialan	Attack of the Clones	char
Dormé	165	NA	brown	light	brown	NA	female	Naboo	Human	Attack of the Clones	char
Dooku	193	80.0	white	fair	brown	102.0	male	Serenno	Human	c("Attack of the Clones", "Revenge of the Sith")	Flitki
Bail Prestor Organa	191	NA	black	tan	brown	67.0	male	Alderaan	Human	c("Attack of the Clones", "Revenge of the Sith")	char
Jango Fett	183	79.0	black	tan	brown	66.0	male	Concord Dawn	Human	Attack of the Clones	char
Zam Wesell	168	55.0	blonde	fair, green, yellow	yellow	NA	female	Zolan	Clawdite	Attack of the Clones	Korcs
Dexter Jettster	198	102.0	none	brown	yellow	NA	male	Ojom	Besalisk	Attack of the Clones	char
Lama Su	NA	88.0	none	grey	black	NA	male	Kamino	Kaminoan	Attack of the Clones	char
Taun We	NA	NA	none	grey	black	NA	female	Kamino	Kaminoan	Attack of the Clones	char
Jocasta Nu	167	NA	white	fair	blue	NA	female	Coruscant	Human	Attack of the Clones	char
Ratts Tyerell	79	15.0	none	grey, blue	unknown	NA	male	Aleen Minor	Aleena	The Phantom Menace	char

name	height	mass	hair_color	skin_color	eye_color	birth_year	gender	homeworld	species	films	vehi
R4-P17	96	NA	none	silver, red	red, blue	NA	female	NA	NA	c("Attack of the Clones", "Revenge of the Sith")	char
Wat Tambor	193	48.0	none	green, grey	unknown	NA	male	Skako	Skakoan	Attack of the Clones	char
San Hill	191	NA	none	grey	gold	NA	male	Muunilinst	Muun	Attack of the Clones	char
Shaak Ti	178	57.0	none	red, blue, white	black	NA	female	Shili	Togruta	c("Attack of the Clones", "Revenge of the Sith")	char
Grievous	NA	159.0	none	brown, white	green, yellow	NA	male	Kalee	Kaleesh	Revenge of the Sith	Tsm pers bike
Tarfful	NA	136.0	brown	brown	blue	NA	male	Kashyyyk	Wookiee	Revenge of the Sith	char
Raymus Antilles	188	79.0	brown	light	brown	NA	male	Alderaan	Human	c("Revenge of the Sith", "A New Hope")	char
Sly Moore	178	48.0	none	pale	white	NA	female	Umbara	NA	c("Attack of the Clones", "Revenge of the Sith")	char
Tion Medon	NA	80.0	none	grey	black	NA	male	Utapau	Pau'an	Revenge of the Sith	char
Finn	NA	NA	black	dark	dark	NA	male	NA	Human	The Force Awakens	char
Rey	NA	NA	brown	light	hazel	NA	female	NA	Human	The Force Awakens	char
Poe Dameron	NA	NA	brown	light	brown	NA	male	NA	Human	The Force Awakens	char
BB8	NA	NA	none	none	black	NA	none	NA	Droid	The Force Awakens	char
Captain Phasma	NA	NA	unknown	unknown	unknown	NA	female	NA	NA	The Force Awakens	char
Padmé Amidala	165	45.0	brown	light	brown	46.0	female	Naboo	Human	c("Attack of the Clones", "The Phantom Menace", "Revenge of the Sith")	char

Summarizing Data

The summarize function can be used to reduce multiple values down to a single value (such as a mean). It is often used in conjunction with the by_group function, to calculate statistics by group. In the code below, the na.rm=TRUE option is used to drop missing values before calculating the means.

```
library(dplyr)

# calculate mean height and mass
newdata = summarize(starwars, mean_ht = mean(height, na.rm = TRUE), mean_mass = mean(mass,
  na.rm = TRUE))
newdata
```

mean_ht	mean_mass
174.358	97.31186

```
# calculate mean height and weight by gender
newdata = group_by(starwars, gender)
newdata = summarize(newdata, mean_ht = mean(height, na.rm = TRUE), mean_wt = mean(mass,
  na.rm = TRUE))
newdata
```

gender	mean_ht	mean_wt
NA	120.0000	46.33333
female	165.4706	54.02000
hermaphrodite	175.0000	1358.00000
male	179.2373	81.00455
none	200.0000	140.00000

Using Pipes

Packages like dplyr and tidyr allow you to write your code in a compact format using the pipe %>% operator. Here is an example.

```
library(dplyr)

# calculate the mean height for women by species
newdata = filter(starwars, gender == "female")
newdata = group_by(newdata, species)
newdata = summarize(newdata, mean_ht = mean(height, na.rm = TRUE))
newdata

# this can be written as
newdata = starwars %>% filter(gender == "female") %>% group_by(species) %>%
  summarize(mean_ht = mean(height, na.rm = TRUE))

newdata
```

species	mean_ht
NA	137.00
Clawdite	168.00
Human	160.25
Kaminoan	213.00
Mirialan	168.00
Tholothian	184.00
Togruta	178.00
Twilek	178.00

species	mean_ht
NA	137.00
Clawdite	168.00
Human	160.25
Kaminoan	213.00
Mirialan	168.00
Tholothian	184.00
Togruta	178.00
Twilek	178.00

The %>% operator passes the result on the left to the first parameter of the function on the right.

Missing Data

Real data are likely to contain missing values. There are three basic approaches to dealing with missing data: feature selection, listwise deletion, and imputation.

- Let's see how each applies to the msleep dataset from the ggplot2 package.
- The msleep dataset describes the sleep habits of mammals and contains missing values on several variables.

Feature selection

In feature selection, you delete variables (columns) that contain too many missing values.

```
data(msleep, package = "ggplot2")

# what is the proportion of missing data for each variable?
pctmiss = colSums(is.na(msleep))/nrow(msleep)
round(pctmiss, 2)
```

##	name	genus	vore	order	conservation
##	0.00	0.00	0.08	0.00	0.35
##	sleep_total	sleep_rem	sleep_cycle	awake	brainwt
##	0.00	0.27	0.61	0.00	0.33
##	bodywt				
##	0.00				

Sixty-one percent of the sleep_cycle values are missing. You may decide to drop it.

Listwise deletion

Listwise deletion involves deleting observations (rows) that contain missing values on any of the variables of interest.

```
# Create a dataset containing genus, vore, and conservation. Delete any
# rows containing missing data.
newdata = select(msleep, genus, vore, conservation)
newdata = na.omit(newdata)
```

Imputation

Imputation involves replacing missing values with “reasonable” guesses about what the values would have been if they had not been missing.

- There are several approaches, as detailed in such packages as VIM, mice, Amelia and missForest.
- Here we will use the kNN function from the VIM package to replace missing values with imputed values.

```
# Impute missing values using the 5 nearest neighbors
library(VIM)
newdata = kNN(msleep, k = 5)
newdata
```

name	genus	vore	order	conservation	sleep_total	sleep_rem	sleep_cycle	awake	brainwt	bodywt
Cheetah	Acinonyx	carni	Carnivora	lc	12.1	1.5	0.1833333	11.90	0.00640	50.000
Owl monkey	Aotus	omni	Primates	lc	17.0	1.8	0.2000000	7.00	0.01550	0.480
Mountain beaver	Aplodontia	herbi	Rodentia	nt	14.4	2.4	0.3833333	9.60	0.01080	1.350
Greater short-tailed shrew	Blarina	omni	Soricomorpha	lc	14.9	2.3	0.1333333	9.10	0.00029	0.019
Cow	Bos	herbi	Artiodactyla	domesticated	4.0	0.7	0.6666667	20.00	0.42300	600.000
Three-toed sloth	Bradypus	herbi	Pilosa	lc	14.4	2.2	0.7666667	9.60	0.02500	3.850
Northern fur seal	Callorhinus	carni	Carnivora	vu	8.7	1.4	0.3833333	15.30	0.01210	20.490
Vesper mouse	Calomys	carni	Rodentia	lc	7.0	0.9	0.6666667	17.00	0.02100	0.045
Dog	Canis	carni	Carnivora	domesticated	10.1	2.9	0.3333333	13.90	0.07000	14.000
Roe deer	Capreolus	herbi	Artiodactyla	lc	3.0	0.5	0.6666667	21.00	0.09820	14.800
Goat	Capri	herbi	Artiodactyla	lc	5.3	0.6	0.6666667	18.70	0.11500	33.500
Guinea pig	Cavis	herbi	Rodentia	domesticated	9.4	0.8	0.2166667	14.60	0.00550	0.728

name	genus	vore	order	conservation	sleep_total	sleep_rem	sleep_cycle	awake	brainwt	bodywt
Grivet	Cercopithecus	omni	Primates	lc	10.0	0.7	0.7500000	14.00	0.17900	4.750
Chinchilla	Chinchilla	herbi	Rodentia	domesticated	12.5	1.5	0.1166667	11.50	0.00640	0.420
Star-nosed mole	Condylura	omni	Soricomorpha	lc	10.3	2.2	0.3500000	13.70	0.00100	0.060
African giant pouched rat	Cricetomys	omni	Rodentia	lc	8.3	2.0	0.1833333	15.70	0.00660	1.000
Lesser short-tailed shrew	Cryptotis	omni	Soricomorpha	lc	9.1	1.4	0.1500000	14.90	0.00014	0.005
Long-nosed armadillo	Dasypus	carni	Cingulata	lc	17.4	3.1	0.3833333	6.60	0.01080	3.500
Tree hyrax	Dendrohyrax	herbi	Hyracoidea	lc	5.3	0.5	0.6666667	18.70	0.01230	2.950
North American Opossum	Didelphis	omni	Didelphimorphia	lc	18.0	4.9	0.3333333	6.00	0.00630	1.700
Asian elephant	Elephas	herbi	Proboscidea	en	3.9	0.5	0.9000000	20.10	4.60300	2547.000
Big brown bat	Eptesicus	insecti	Chiroptera	lc	19.7	3.9	0.1166667	4.30	0.00030	0.023
Horse	Equus	herbi	Perissodactyla	domesticated	2.9	0.6	1.0000000	21.10	0.65500	521.000
Donkey	Equus	herbi	Perissodactyla	domesticated	3.1	0.4	0.6666667	20.90	0.41900	187.000
European hedgehog	Erinaceus	omni	Erinaceomorpha	lc	10.1	3.5	0.2833333	13.90	0.00350	0.770
Patas monkey	Erythrocebus	omni	Primates	lc	10.9	1.1	0.5500000	13.10	0.11500	10.000
Western american chipmunk	Eutamias	herbi	Rodentia	lc	14.9	2.4	0.3500000	9.10	0.00190	0.071
Domestic cat	Felis	carni	Carnivora	domesticated	12.5	3.2	0.4166667	11.50	0.02560	3.300
Galago	Galago	omni	Primates	domesticated	9.8	1.1	0.5500000	14.20	0.00500	0.200
Giraffe	Giraffa	herbi	Artiodactyla	cd	1.9	0.4	0.7666667	22.10	0.42300	899.995
Pilot whale	Globicephalus	carni	Cetacea	cd	2.7	0.1	0.7666667	21.35	0.41900	800.000
Gray seal	Haliophoca	carni	Carnivora	lc	6.2	1.5	0.1666667	17.80	0.32500	85.000
Gray hyrax	Heterohyrax	herbi	Hyracoidea	lc	6.3	0.6	0.6666667	17.70	0.01227	2.625
Human	Homo	omni	Primates	domesticated	8.0	1.9	1.5000000	16.00	1.32000	62.000
Mongoose lemur	Lemur	herbi	Primates	vu	9.5	0.9	0.4166667	14.50	0.01210	1.670
African elephant	Loxodonta	herbi	Proboscidea	vu	3.3	0.4	0.9000000	20.70	5.71200	6654.000
Thick-tailed opossum	Lutreolina	carni	Didelphimorphia	lc	19.4	6.6	0.3833333	4.60	0.00630	0.370
Macaque	Macaca	omni	Primates	domesticated	10.1	1.2	0.7500000	13.90	0.17900	6.800
Mongolian gerbil	Meriones	herbi	Rodentia	lc	14.2	1.9	0.3833333	9.80	0.00100	0.053
Golden hamster	Mesocricetus	herbi	Rodentia	en	14.3	3.1	0.2000000	9.70	0.00100	0.120
Vole	Microtus	herbi	Rodentia	lc	12.8	1.9	0.3833333	11.20	0.00190	0.035
House mouse	Mus	herbi	Rodentia	nt	12.5	1.4	0.1833333	11.50	0.00040	0.022
Little brown bat	Myotis	insecti	Chiroptera	lc	19.9	2.0	0.2000000	4.10	0.00025	0.010
Round-tailed muskrat	Neofiber	herbi	Rodentia	nt	14.6	1.9	0.3833333	9.40	0.00260	0.266
Slow loris	Nyctibeus	carni	Primates	lc	11.0	2.2	0.1833333	13.00	0.01250	1.400
Degu	Octodon	herbi	Rodentia	lc	7.7	0.9	0.6666667	16.30	0.02100	0.210

name	genus	vore	order	conservation	sleep_total	sleep_rem	sleep_cycle	awake	brainwt	bodywt
Northern grasshopper mouse	Onychomys	carni	Rodentia	lc	14.5	1.9	0.3833333	9.50	0.00260	0.028
Rabbit	Oryctolagus	herbi	Lagomorpha	domesticated	8.4	0.9	0.4166667	15.60	0.01210	2.500
Sheep	Ovis	herbi	Artiodactyla	domesticated	3.8	0.6	0.6666667	20.20	0.17500	55.500
Chimpanzee	Pan	omni	Primates	domesticated	9.7	1.4	1.4166667	14.30	0.44000	52.200
Tiger	Panthera	carni	Carnivora	en	15.8	2.4	0.3833333	8.20	0.01080	162.564
Jaguar	Panthera	carni	Carnivora	nt	10.4	2.2	0.5000000	13.60	0.15700	100.000
Lion	Panthera	carni	Carnivora	vu	13.5	1.9	0.3833333	10.50	0.01080	161.499
Baboon	Papio	omni	Primates	domesticated	9.4	1.0	0.6666667	14.60	0.18000	25.235
Desert hedgehog	Paraechinus	omni	Erinaceomorpha	lc	10.3	2.7	0.3333333	13.70	0.00240	0.550
Potto	Perodicticus	omni	Primates	lc	11.0	0.9	0.4166667	13.00	0.01750	1.100
Deer mouse	Peromyscus	omni	Rodentia	lc	11.5	1.5	0.1833333	12.50	0.00640	0.021
Phalanger	Phalanger	omni	Diprotodontia	lc	13.7	1.8	0.1833333	10.30	0.01140	1.620
Caspian seal	Phoca	carni	Carnivora	vu	3.5	0.4	0.7666667	20.50	0.41900	86.000
Common porpoise	Phocoena	carni	Cetacea	vu	5.6	0.7	0.7666667	18.45	0.02100	53.180
Potoroo	Potorous	herbi	Diprotodontia	lc	11.1	1.5	0.3833333	12.90	0.01080	1.100
Giant armadillo	Priodontes	insecti	Cingulata	en	18.1	6.1	0.2000000	5.90	0.08100	60.000
Rock hyrax	Procavia	herbi	Hyracoidea	lc	5.4	0.5	0.6666667	18.60	0.02100	3.600
Laboratory rat	Rattus	herbi	Rodentia	lc	13.0	2.4	0.1833333	11.00	0.00190	0.320
African striped mouse	Rhabdomys	omni	Rodentia	lc	8.7	0.9	0.6666667	15.30	0.02100	0.044
Squirrel monkey	Saimiri	omni	Primates	lc	9.6	1.4	0.5500000	14.40	0.02000	0.743
Eastern american mole	Scalopus	insecti	Soricomorpha	lc	8.4	2.1	0.1666667	15.60	0.00120	0.075
Cotton rat	Sigmodon	herbi	Rodentia	domesticated	11.3	1.1	0.1500000	12.70	0.00118	0.148
Mole rat	Spalax	omni	Rodentia	lc	10.6	2.4	0.3333333	13.40	0.00300	0.122
Arctic ground squirrel	Spermophilus	herbi	Rodentia	lc	16.6	1.8	0.2000000	7.40	0.00570	0.920
Thirteen-lined ground squirrel	Spermophilus	herbi	Rodentia	lc	13.8	3.4	0.2166667	10.20	0.00400	0.101
Golden-mantled ground squirrel	Spermophilus	herbi	Rodentia	lc	15.9	3.0	0.3833333	8.10	0.00260	0.205
Musk shrew	Suncus	herbi	Soricomorpha	lc	12.8	2.0	0.1833333	11.20	0.00033	0.048
Pig	Sus	omni	Artiodactyla	domesticated	9.1	2.4	0.5000000	14.90	0.18000	86.250
Short-nosed echidna	Tachyglossus	insecti	Monotremata	lc	8.6	2.2	0.2333333	15.40	0.02500	4.500
Eastern american chipmunk	Tamias	herbi	Rodentia	lc	15.8	2.4	0.3833333	8.20	0.01080	0.112
Brazilian tapir	Tapirus	herbi	Perissodactyla	vu	4.4	1.0	0.9000000	19.60	0.16900	207.501
Tenrec	Tenrec	omni	Afrosoricida	lc	15.6	2.3	0.1833333	8.40	0.00260	0.900
Tree shrew	Tupaia	omni	Scandentia	lc	8.9	2.6	0.2333333	15.10	0.00250	0.104
Bottle-nosed dolphin	Tursiops	carni	Cetacea	lc	5.2	0.4	0.7666667	18.80	0.02100	173.330

name	genus	vore	order	conservation	sleep_total	sleep_rem	sleep_cycle	awake	brainwt	bodywt
Genet	Genetta	carni	Carnivora	lc	6.3	1.3	0.4166667	17.70	0.01750	2.000
Arctic fox	Vulpes	carni	Carnivora	lc	12.5	2.2	0.1833333	11.50	0.04450	3.380
Red fox	Vulpes	carni	Carnivora	lc	9.8	2.4	0.3500000	14.20	0.05040	4.230