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boodleAI

AI 101

for Nonprofits

Wed April 24 | 1pm ET | 12pm CT | 10am PT



Agenda

- AI 101
- Tech & Infrastructure
- Algorithm Models
- How Does It Work?
- Questions

SESSION HOSTS



Kelly Velasquez-Hague
VP of Content Marketing
OneCause



France Hoang
Chairman
boodleAI

AI 101

A photograph of a group of people in a meeting, looking at a laptop screen. The image is overlaid with a teal gradient and a thin orange horizontal line. The text 'AI 101' is written in white on the left side.



WHAT IS
**ARTIFICIAL
INTELLIGENCE?**

WHAT IS ARTIFICIAL INTELLIGENCE?

A **program** that acts and thinks in ways that resemble intelligent humans.

- Sometimes called an agent
- We use the term **AI ASSISTANT**

Strong AI
Human Level
Intelligence

Weak AI
Limited Set of Tasks

Machine Learning

A photograph of a server room aisle with a person in the distance, overlaid with the text "WHAT IS MACHINE LEARNING?". The text is white, with "MACHINE LEARNING?" on a yellow bar. The background is a server room with blue lighting and a person in the distance.

WHAT IS
**MACHINE
LEARNING?**

WHAT IS MACHINE LEARNING?

Allows AI assistants to learn from data without human intervention.

Requirements:



Data

Tools /
Infrastructure

Computing
Power

Algorithms /
Models

KEY TERMS

Attribute/Feature

Observation/Instance

	A	B	C	D	E	F	G	H	I
1	first_name	last_name	email	phone	address	city	state	gender	
2	Mirelle	Summerrell	msummerrell@esurl.com	850-852-0213	08335 Heffernan Trail	Tallahassee	Florida	Female	
3	M	Summerrell	msummerrell@esurl.com			Florida	Florida	Female	
4	Gaylor	Longden	glongden2@mail.ru	917-340-9821	6 New Castle Circle	Bronx	New York	Male	
5	Becca	Beggan	bbeggan3@barnesandnoble.com	713-439-6223	96325 Lakeland Drive	Houston	Texas	Female	
6	Gaylor	L	glongden2@mail.ru		6 Sutherland Avenue	Washington	New York	Male	
7	Richie	Strodder	rstrodder@virginia.edu	202-559-0104			District of Columbia	Male	
8	Gustaf	Hetje	ghetje@marketwatch.com	702-306-4798	7 Hallows Hill	Las Vegas	Nevada	Male	
9	Ximenes	Kobelt	skobelt8@amazonaws.com	423-350-7663	708 Melrose Parkway	Chattanooga	Tennessee	Male	
10	Willie	Kirkwood	wkirkwood9@soundcloud.com	602-430-4934	09 Doe Crossing Center	Phoenix	Arizona	Female	
11	Willie	Kirkwood	wkirkwood9@soundcloud.com		09 Doe Crossing Center	Phoenix	Arizona	Female	
12	Willie	Kirkwood	wkirkwood9@soundcloud.com		09 Doe Crossing Center	Phoenix	Arizona	Female	
13	Tandi	Okenden	tokenden@tiny.cc	425-651-4534	03648 Stuart Parkway	Seattle	Washington	Female	
14	Reinaldos	Bullock	rbullock@geocities.jp	915-323-9182	5680 Briar Crest Court	El Paso	Texas	Male	
15	Willie	Kirkwood	wkirkwood9@soundcloud.com			Arizona	Arizona	Female	
16	Rourke	Shobrook	rshobrookf@hostgator.com	860-155-2742	696 Mariners Cove Street	Hartford	Connecticut	Male	
17	Tandi	Okenden	tokenden@tiny.cc	425-651-4534	03648 Stuart Parkway	Seattle	Washington	Female	
18	Caryl	Endecott	cendecottk@flavors.me		190 Vernon Center	Omaha	Nebraska	Male	
19	Percy	Cattach	pcattachi@whitehouse.gov		04019 Shopko Street	Pensacola	Florida	Male	
20	Jesus	Brenston	jbrenstonh@vistaprint.com	301-820-0042	69927 Swallow Parkway	Hyattsville	Maryland	Male	
21	Caryl	Endecott	cendecottk@flavors.me		190 Vernon Center	Omaha	Nebraska	Male	
22	Abbe	Rice	aralr@cam.ac.uk	239-151-9852	927 Sycamore Court	Fort Myers	Florida	Female	
23	Barnabas	Jubert	bjubertm@hatena.ne.jp	706-318-5897	2 Grasskamp Lane	Athens	Georgia	Male	
24	Karlene	Goldsworthy	kgoldsworthy@hostgator.com	864-204-0107	276 Merry Way	Spartanburg	South Carolina	Female	
25	Erinn	Facey	efaceyo@google.pl		894 Straubel Trail	Santa Fe	New Mexico	Female	
26	Lonnie	Bemwell	lbemwellq@surveymonkey.com	614-784-2444	2 Rusk Hill	Columbus	Ohio	Male	
27	Lonnie	Bemwell	lbemwellq@surveymonkey.com	614-784-2444	2 Rusk Hill	Columbus	Ohio	Male	
28	Alexis	Ghidini	aghidini@nasa.gov	540-301-1875	953 Forest Court	Roanoke	Virginia	Male	

Data

Tools / Infrastructure

Computing Power

Algorithms / Models

KEY TERMS

Attributes/Features

Observations/Instances

	A	B	C	D	E	F	G	H	I
1	first_name	last_name	email	phone	address	city	state	gender	
2	Mirelle	Summerrell	msummerrello@eepurl.com	850-852-0213	08335 Heffernan Trail	Tallahassee	Florida	Female	
3	M	Summerrell	msummerrello@eepurl.com				Florida	Female	
4	Gaylor	Longden	glongden2@mail.ru	917-340-9821	6 New Castle Circle	Bronx	New York	Male	
5	Becca	Beggan	bbeggan3@barnesandnoble.com	713-439-6223	96325 Lakeland Drive	Houston	Texas	Female	
6	Gaylor	L	glongden2@mail.ru				New York	Male	
7	Richie	Strodder	rstrodder5@virginia.edu	202-559-0104	6 Sutherland Avenue	Washington	District of Columbia	Male	
8		Strodder	rstrodder5@virginia.edu						
9	Gustaf	Hatje	ghatje7@marketwatch.com	702-306-2798	7 Hallows Hill	Las Vegas	Nevada	Male	
10	Ximenes	Kobelt	skobelt8@amazonaws.com	423-350-7663	708 Melrose Parkway	Chattanooga	Tennessee	Male	
11	Willie	Kirkwood	wkirkwood9@soundcloud.com	602-430-4934	09 Doe Crossing Center	Phoenix	Arizona	Female	
12	Willie	Kirkwood	wkirkwood9@soundcloud.com		09 Doe Crossing Center	Phoenix	Arizona	Female	
13	Willie	Kirkwood	wkirkwood9@soundcloud.com		09 Doe Crossing Center	Phoenix	Arizona	Female	
14	Tandi	Okenden	tokeneden6@tiny.cc	425-651-4534	03648 Stuart Parkway	Seattle	Washington	Female	
15	Reinaldos	Bullcock	rbullcock@geocities.jp	915-323-9182	5680 Briar Crest Court	El Paso	Texas	Male	
16	Willie	Kirkwood	wkirkwood9@soundcloud.com				Arizona		
17	Rourke	Shobrook	rshobrook@hostgator.com	860-155-2742	696 Mariners Cove Street	Hartford	Connecticut	Male	
18	Tandi	Okenden	tokeneden6@tiny.cc	425-651-4534	03648 Stuart Parkway	Seattle	Washington	Female	
19	Caryl	Endecott	cendecottk@flavors.me		190 Vernon Center	Omaha	Nebraska	Male	
20	Percy	Cattach	pcattach@whitehouse.gov		04019 Shopko Street	Pensacola	Florida	Male	
21	Jesus	Brenston	jbrenston@vistaprint.com	301-820-0042	69927 Swallow Parkway	Hyattsville	Maryland	Male	
22	Caryl	Endecott	cendecottk@flavors.me		190 Vernon Center	Omaha	Nebraska	Male	
23	Abbe	Race	aracel@cam.ac.uk	239-151-9852	927 Sycamore Court	Fort Myers	Florida	Female	
24	Barnabas	Jubert	bjuberm@hatena.ne.jp	706-318-5897	2 Grasskamp Lane	Athens	Georgia	Male	
25	Karlene	Goldsworthy	kgoldsworthy@hostgator.com	864-204-0107	276 Merry Way	Spartanburg	South Carolina	Female	
26	Erinn	Facey	efacey@google.pl		894 Straubel Trail	Santa Fe	New Mexico	Female	
27	Lonnie	Bemwell	lbemwell@surveymonkey.com	614-784-2444	2 Rusk Hill	Columbus	Ohio	Male	
28	Lonnie	Bemwell	lbemwell@surveymonkey.com	614-784-2444	2 Rusk Hill	Columbus	Ohio	Male	
29	Alexis	Ghidini	aghidini@nasa.gov	540-301-1875	953 Forest Court	Roanoke	Virginia	Male	

of Dimensions = # Features

Data

Tools /
Infrastructure

Computing
Power

Algorithms /
Models

MESSY DATA SET

Duplicate records / Missing information

	A	B	C	D	E	F	G	H	I
1	first_name	last_name	email	phone	address	city	state	gender	
2	Mirelle	Summerrell	msummerrell0@eepurl.com	850-852-0213	08335 Heffernan Trail	Tallahassee	Florida	Female	
3	M	Summerrell	msummerrell0@eepurl.com				Florida	Female	
4	Gaylor	Longden	glongden2@gmail.ru	417-349-9291	8499 Park Circle	Brooklyn	New York	Male	
5	Becca	Beggan	bbeggan3@barnesandnoble.com	713-429-6223	96325 Lalaland Drive	Houston	Texas	Female	
6	Gaylor	L	glongden2@mail.ru				New York	Male	
7	Richie	Strodder	rstrodder5@virginia.edu	202-559-0104	6 Sutherland Avenue	Washington	District of Columbia	Male	
8	Richie	Strodder	rstrodder5@virginia.edu						
9	Gustaf	Hatje	ghatje7@marketwatch.com	702-306-2798	7 Hallows Hill	Las Vegas	Nevada	Male	
10	Ximenes	Kobelt	xkobelt5@amazonaws.com	423-350-7593	708 Melrose Parkway	Chattanooga	Tennessee	Male	
11	Willie	Kirkwood	wkirkwood9@soundcloud.com	602-430-4934	09 Doe Crossing Center	Phoenix	Arizona	Female	
12	Willie	Kirkwood	wkirkwood9@soundcloud.com				Arizona	Female	
13	Willie	Kirkwood	wkirkwood9@soundcloud.com				Phoenix	Arizona	Female
14	Tandi	Okenden	tokenden6@tiny.cc	425-851-4534	03648 Stuart Parkway	Seattle	Washington	Female	
15	Reinaldos	Bullock	rbullockd@geocities.jp	915-323-9182	5680 Briar Crest Court	El Paso	Texas	Male	
16	Willie	Kirkwood	wkirkwood9@soundcloud.com				Arizona		
17	Rourke	Shobrook	rshobrook4@hostgator.com	860-155-2742	696 Mariners Cove Street	Hartford	Connecticut	Male	
18	Tandi	Okenden	tokenden6@tiny.cc	425-851-4534	03648 Stuart Parkway	Seattle	Washington	Female	
19	Caryl	Endecott	cendecott3@flavors.me		190 Vernon Center	Omaha	Nebraska	Male	
20	Percy	Cattach	pcattachi@whitehouse.gov		04019 Shopko Street	Pensacola	Florida	Male	
21	Jesus	Brenston	jbrentonh@vistaprint.com	301-820-0042	69927 Swallow Parkway	Hyattsville	Maryland	Male	
22	Caryl	Endecott	cendecott3@flavors.me		190 Vernon Center	Omaha	Nebraska	Male	
23	Abbe	Race	aracel@cam.ac.uk	239-151-9852	927 Sycamore Court	Fort Myers	Florida	Female	
24	Barnabas	Jubert	bjubertm@hatena.ne.jp	706-318-5697	2 Grasskamp Lane	Athens	Georgia	Male	
25	Karlene	Goldsworthy	kgoldsworthyh@hostgator.com	864-204-0107	276 Merry Way	Spartanburg	South Carolina	Female	
26	Birnie	Facey	efacey0@google.pl		894 Strabell Trail	Santa Fe	New Mexico	Female	
27	Lonnie	Bemwell	lbemwellq@surveymonkey.com	614-784-2444	2 Rusk Hill	Columbus	Ohio	Male	
28	Lonnie	Bemwell	lbemwellq@surveymonkey.com	614-784-2444	2 Rusk Hill	Columbus	Ohio	Male	
29	Alexis	Ghidini	aghidinir@nasa.gov	540-301-1875	953 Forest Court	Roanoke	Virginia	Male	

Data

Tools /
Infrastructure

Computing
Power

Algorithms /
Models

“SKINNY” DATA SET

Lots of records / Few features

	A	B	C	J	K	L	M	N	O	P	Q	R	S	T
1	first_name	last_name	email	Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9	Column10	Column11
2	Mirelle	Summerrell	msummerrell0@eepurl.com											
3	Tracey	Stoppe	tstoppe1@ucoz.ru											
4	Gaylor	Longden	glongden2@mail.ru											
5	Becca	Beggan	bbeggan3@barnesandnoble.com											
6	Marika	Craghead	mcraghead4@exblog.jp											
7	Richie	Strodger	rstrodger5@virginia.edu											
8	Tandi	Okenden	tokenen6@tiny.cc											
9	Gustaf	Hatje	ghatje7@marketwatch.com											
10	Ximenes	Kobelt	xkobelt8@amazonaws.com											
11	Willie	Kirkwood	wkirkwood9@soundcloud.com											
12	Thorin	Gulka	tgulka@so-net.ne.jp											
13	Leandra	Van Daalen	lvandaalenb@hao123.com											
14	Christos	Chastey	cchastey@mysql.com											
15	Reinaldos	Bullcock	rbullcock@geocities.jp											
16	Clea	Dallender	cdallendere@rakuten.co.jp											
17	Rourke	Shobrook	rshobrookf@hostgator.com											
18	Chrissie	Tolliday	ctolliday@blogtalkradio.com											
19	Jesus	Brenston	jbrenstonh@vistaprint.com											
20	Percy	Cattach	pcattachi@whitehouse.gov											
21	Ellette	Crew	ecrew@slideshare.net											
22	Caryl	Endecott	cendecottk@flavors.me											
23	Abbe	Race	arace@cam.ac.uk											
24	Barnabas	Jubert	bjubertm@hatena.ne.jp											
25	Karlene	Goldsworthy	kgoldsworthy@hostgator.com											
26	Erlinn	Facey	efacey@google.pl											
27	Dawn	Greschke	dgreschkep@drupal.org											
28	Lonnie	Bemwell	lbemwell@surveymonkey.com											

Data

Tools /
Infrastructure

Computing
Power

Algorithms /
Models

“SHORT” DATA SET

Few records / Lots of features

1	first_name	last_name	email	phone	address	city	state	gender	Attended	Column1	Column2
2	Mirrelle	Summerrell	msummerrell@espurl.com	850-852-0213	08335 Heffernan Trail	Tallahassee	Florida	Female	Yes		
3	Tracey	Stoppe	tstoppe1@ucoz.ru	718-197-7133	0 Fieldstone Point	Brooklyn	New York	Female	No		
4	Gaylor	Longden	glongden2@mail.ru	917-340-9821	6 New Castle Circle	Bronx	New York	Male	Yes		
5	Becca	Beggan	bbeggan3@barnesandnoble.cor	713-439-6223	96325 Lakeland Drive	Houston	Texas	Female	No		
281											
282											
283											
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285											
286											
287											
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300											
301											
302											
303											

Data

Tools /
Infrastructure

Computing
Power

Algorithms /
Models

LABELLED DATA SET

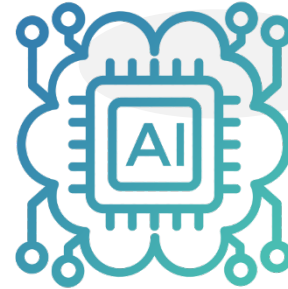
Labeled with value to be predicted

	A	B	C	D	E	F	G	H	I	J	K
1	first_name	last_name	email	phone	address	city	state	gender	is_active	Column1	Column2
2	Mirelle	Summerrell	msummerrell0@eepurl.com	850-852-0213	08355 Heffernan Trail	Tallahassee	Florida	Female	Yes		
3	Tracey	Stoppe	tstoppe1@ucocz.ru	718-197-7133	0 Fieldstone Point	Brooklyn	New York	Female	No		
4	Gaylor	Longden	glongden2@mail.ru	917-340-9821	6 New Castle Circle	Bronx	New York	Male	Yes		
5	Becca	Beggan	bbeggan3@barnesandnoble.com	713-439-6223	96325 Lakeland Drive	Houston	Texas	Female	No		
6	Marika	Craghead	mcraghead4@exblog.jp	571-553-9696	96 Aberg Place	Arlington	Virginia	Female	Yes		
7	Richie	Strodger	rstrodger5@virginia.edu	202-559-0104	6 Sutherland Avenue	Washington	District of Columbia	Male	No		
8	Tandi	Okenden	tokenden6@tiny.cc	425-651-4534	03648 Stuart Parkway	Seattle	Washington	Female	Yes		
9	Gustaf	Hatje	ghatje7@marketwatch.com	702-306-2798	7 Hallows Hill	Las Vegas	Nevada	Male	No		
10	Ximenes	Kobelt	skobelt8@amazonaws.com	423-350-7663	708 Melrose Parkway	Chattanooga	Tennessee	Male	Yes		
11	Willie	Kirkwood	wkirkwood9@soundcloud.com	602-430-4934	09 Doe Crossing Center	Phoenix	Arizona	Female	No		
12	Thorin	Gulk	tgulka@so-net.ne.jp	781-190-6862	8 Miller Avenue	Boston	Massachusetts	Male	Yes		
13	Leandra	Van Daalen	lvandaalen@hao123.com	410-105-8749	2778 Coolidge Trail	Annapolis	Maryland	Female	Yes		
14	Christos	Chastey	chasteyc@mysql.com	530-199-9417	39167 Fordem Way	Sacramento	California	Male	Yes		
15	Reinaldos	Bulcock	rbulcockd@gocities.jp	915-323-9182	5680 Briar Crest Court	El Paso	Texas	Male	No		
16	Clea	Dallender	cdallendere@rakuten.co.jp	808-552-1583	3 Maple Wood Point	Honolulu	Hawaii	Female	Yes		
17	Rourke	Shobrook	rshobrookf@hostgator.com	860-155-2742	696 Mariners Cove Street	Hartford	Connecticut	Male	No		
18	Chrissie	Tolliday	ctollidayg@blogtalkradio.com	505-993-3807	387 Fallview Alley	Albuquerque	New Mexico	Female	Yes		
19	Jesus	Brenston	jbrentonh@vistaprint.com	301-820-0042	69927 Swallow Parkway	Hyattsville	Maryland	Male	No		
20	Percy	Cattach	pcattachi@whitehouse.gov	850-945-2212	04019 Shopko Street	Pensacola	Florida	Male	Yes		
21	Ellette	Crew	ecrewj@slideshare.net	518-385-6839	70330 Sauthoff Point	Albany	New York	Female	No		
22	Caryl	Endecott	cendecottk@flavors.me	402-156-1704	190 Vernon Center	Omaha	Nebraska	Male	Yes		
23	Abbe	Race	arace@cam.ac.uk	239-151-9852	927 Sycamore Court	Fort Myers	Florida	Female	No		
24	Barnabas	Jubert	bjubertm@hatena.ne.jp	706-318-5897	2 Grasskamp Lane	Athens	Georgia	Male	Yes		
25	Karlene	Goldsworthy	kgoldsworthyh@hostgator.com	864-204-0107	276 Merry Way	Spartanburg	South Carolina	Female	No		
26	Erin	Facey	efaceyo@google.pl	505-159-9362	894 Straubel Trail	Santa Fe	New Mexico	Female	Yes		
27	Dawn	Greschke	dgreschkep@drupal.org	281-389-4335	1771 Superior Parkway	Houston	Texas	Female	Yes		
28	Lonnie	Bemwell	lbemwellq@surveymonkey.com	614-784-2444	2 Rusk Hill	Columbus	Ohio	Male	Yes		



Questions?

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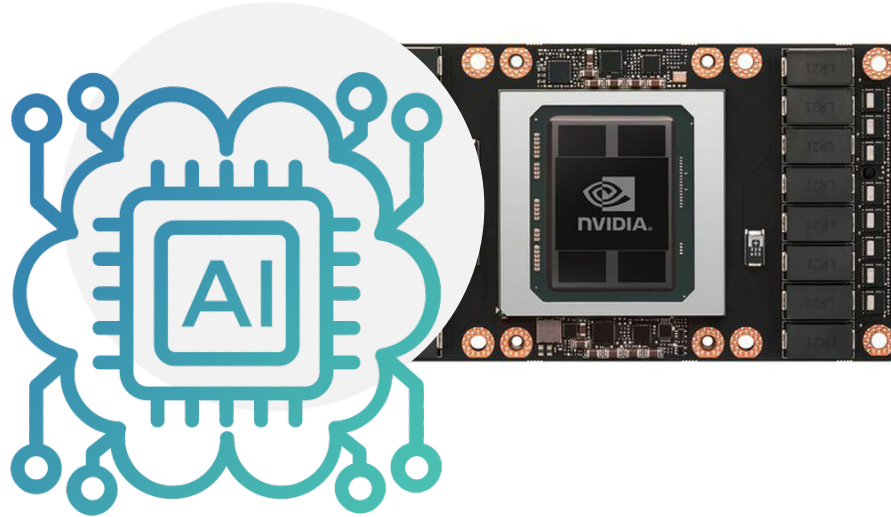
AI ASSISTANT

Data

Tools /
Infrastructure

Computing
Power

Algorithms /
Models



AI ASSISTANT

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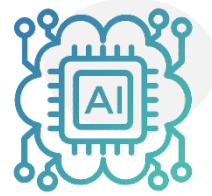

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Data

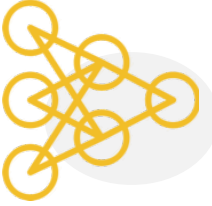
Tools / Infrastructure

Computing Power

Algorithms / Models



AI Assistant

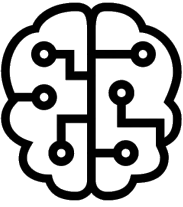


Algorithm



ID	Name	Full Name	Email	Phone	Address	City	State	Gender	Attended class	Column	Color
1	Minnie	Summerville	msummerv@gspsurf.com	850-852-0213	08135 Heffernan Trail	Tallahassee	Florida	Female	Yes		
2	Tracy	Shipp	ttshipp@ducc.edu	718-287-7213	6 Fieldstone Point	Brooklyn	New York	Female	No		
3	Gaylor	Langdon	glangdon@gmail.com	517-340-9621	6 New Castle Circle	Bronx	New York	Male	Yes		
4	Becca	Beggs	bbeggs@harrimanmiddle.com	713-449-6223	9633 Lakeland Drive	Houston	Texas	Female	No		
5	Macka	Croftland	mcroftl@ed.gov	571-653-9666	66 Albany Square	Jarlington	Virginia	Female	Yes		
6	Richie	Stradden	rstadden@evgenia.edu	202-939-0324	6 Sutherland Avenue	Washington	District of Columbia	Male	No		
7	Tandi	Olsenden	tolsende@brevard.edu	407-643-6333	10648 Stuart Parkway	Seattle	Washington	Female	Yes		
8	Gustaf	Werge	gw@markenwatch.com	702-866-2768	7 Fullway Hill	Las Vegas	Nevada	Male	No		
9	Stonney	Kalish	skalish@sonnet.com	423-763-7663	788 Madison Parkway	Charlottesville	Tennessee	Male	Yes		
10	Willa	Kirkwood	wkirkwo@soundcloud.com	402-450-4934	08 Doe Crossing Center	Phoenix	Arizona	Female	No		
11	Therese	Gunk	tgunk@netnet.com	781-286-4863	8 Miller Avenue	Boston	Massachusetts	Male	Yes		
12	Leonora	Van Dusen	lvanduse@hcc12.com	410-220-4749	2778 Coolidge Trail	Annapolis	Maryland	Female	Yes		
13	Christie	Chabrey	rchabrey@mytel.com	530-293-9417	15117 Fardon Way	Hayward	California	Male	Yes		
14	Resendee	Bullough	rbullou@gsnet.com	515-519-9181	5480 Bar Court Court	El Paso	Texas	Male	No		
15	Dea	Dallender	cdallender@akuzen.com	808-952-1563	3 Maple Wood Point	Honolulu	Hawaii	Female	No		
16	Roscoe	Shobrook	rshobroo@hogan.com	860-426-0241	684 Meyers Cove Street	Storford	Connecticut	Male	Yes		
17	Christie	Tolliday	ctolliday@bgsu.edu	505-959-3827	387 Falknew Alley	Albuquerque	New Mexico	Female	Yes		
18	Jesse	Brennan	jbrannen@hugoburn.com	301-620-0241	6927 Swadlow Parkway	Myrtlebe	Maryland	Male	No		
19	Percy	Catnach	pcatnach@whitehouse.gov	850-940-2212	06019 Shopko Street	Pensacola	Florida	Male	Yes		
20	Janice	Crew	jcrew@hishaw.net	515-386-4839	7030 Southoff Point	Albany	New York	Female	No		
21	Carly	Endicott	ecendicott@frees.com	405-556-5764	150 Vernon Court	Chula	Idaho	Male	Yes		
22	Abbe	Ruce	aruce@com.ac.uk	238-551-9852	927 Sycamore Court	Fort Myers	Florida	Female	No		
23	Bernabe	Jahert	bjahert@hawaii.edu	768-248-5807	2 Serrano Lane	Albany	Georgia	Male	Yes		
24	Karlene	Goldsworthy	kgoldswor@hoganator.com	864-204-0287	276 Merry Way	Sparksburg	South Carolina	Female	No		
25	Finn	Entry	fentry@pages.com	505-248-9161	886 Stranbel Trail	Santa Fe	New Mexico	Female	Yes		
26	Dawn	Grewskie	dgrechke@dupol.org	281-889-4335	1771 Superior Parkway	Houston	Texas	Female	Yes		
27	Louise	Barnwell	lbarnwell@surrymynsky.com	616-768-2444	2 Buck Hill	Columbus	Ohio	Male	Yes		

Training Data Set



Model



AI Tasks

WHAT CAN MACHINE LEARNING DO?

With the right data, model, tools, and computing power, machine learning can perform the following tasks (among many other tasks): (1) **classification**; (2) **prediction**; (3) **clustering**; or (4) **identification of key features**.

Classification

Prediction

Clustering

**Identification of
Key Features**

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Classification

Prediction

Clustering

Identification of
Key Features

PREDICTING WHAT LABEL BELONGS TO A PARTICULAR RECORD



Classification

Prediction

Clustering

Identification of
Key Features

PREDICTING WHAT LABEL BELONGS TO A PARTICULAR RECORD



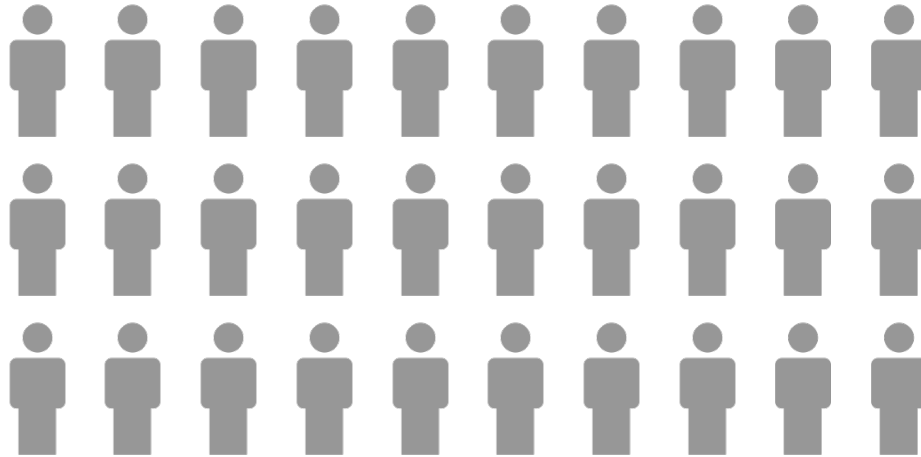
Classification

Prediction

Clustering

Identification of
Key Features

PREDICTING A TARGET VALUE FOR EACH RECORD



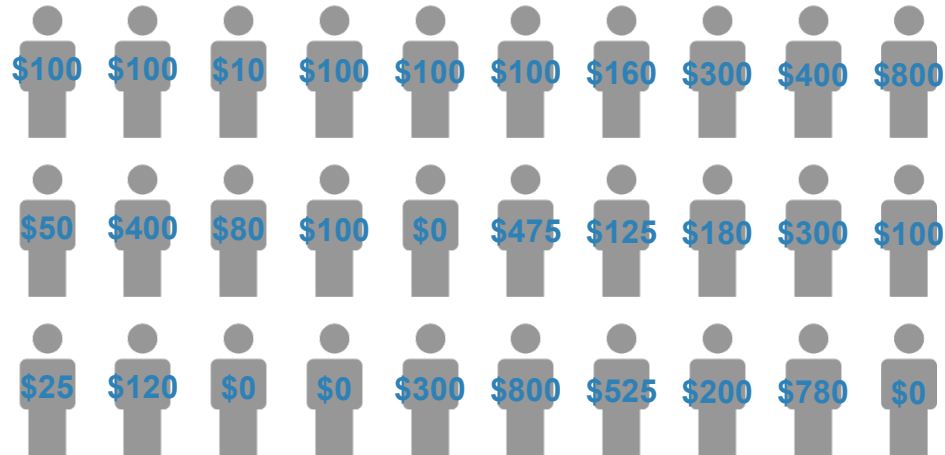
Classification

Prediction

Clustering

Identification of
Key Features

PREDICTING A TARGET VALUE FOR EACH RECORD



Classification

Prediction

Clustering

Identification of
Key Features

PLACE RECORDS INTO GROUPS OF SIMILAR RECORDS



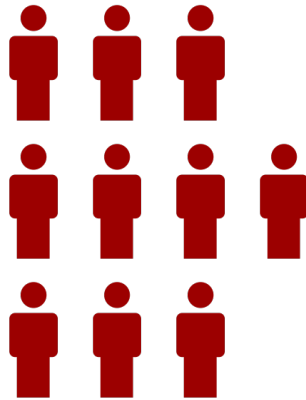
Classification

Prediction

Clustering

Identification of
Key Features

PLACE RECORDS INTO GROUPS OF SIMILAR RECORDS



Classification

Prediction

Clustering

Identification of
Key Features

WHAT FEATURES ARE MOST IMPORTANT?

	A	B	C	D	E	F	G	H	I	J	K
1	first_name	last_name	email	phone	address	city	state	gender	Address_City	Column1	Column
2	Mirelle	Summerrell	msummerrell0@eepurl.com	850-852-0213	08335 Heffernan Trail	Tallahassee	Florida	Female	Yes		
3	Tracey	Stoppe	tstoppe1@ucoz.ru	718-197-7133	0 Fieldstone Circle	Brooklyn	New York	Female	No		
4	Gaylor	Longden	glongden2@mail.ru	917-340-9821	6 New Castle Circle	Bronx	New York	Male	Yes		
5	Becca	Beggan	bbeggan3@barnesandnoble.com	713-439-6223	96325 Lakeland Drive	Houston	Texas	Female	No		
6	Marika	Craghead	mcraghead4@exblog.jp	571-553-9696	96 Aberg Place	Arlington	Virginia	Female	Yes		
7	Richie	Strodger	rstrodder5@virginia.edu	202-559-0104	6 Sutherland Avenue	Washington	District of Columbia	Male	No		
8	Tandi	Okenden	tokenden6@tiny.cc	425-651-4534	03648 Stuart Parkway	Seattle	Washington	Female	Yes		
9	Gustaf	Hatje	ghatje7@marketwatch.com	702-306-2798	7 Hallows Hill	Las Vegas	Nevada	Male	No		
10	Ximenes	Kobelt	xkobelt8@amazonaws.com	423-350-7663	708 Melrose Parkway	Chattanooga	Tennessee	Male	Yes		
11	Willie	Kirkwood	wkirkwood9@soundcloud.com	602-430-4934	09 Doe Crossing Center	Phoenix	Arizona	Female	No		
12	Thorin	Gulk	tgulka@so-net.ne.jp	781-190-6862	8 Miller Avenue	Boston	Massachusetts	Male	Yes		
13	Leandra	Van Daalen	lvandaalen@hao123.com	410-105-8749	2778 Coolidge Trail	Annapolis	Maryland	Female	Yes		
14	Christos	Chastey	cchasteyc@mysqj.com	530-199-9417	39167 Fordem Way	Sacramento	California	Male	Yes		
15	Reinolds	Bullicock	rbullicockd@geocities.jp	915-323-9182	5680 Briar Crest Court	El Paso	Texas	Male	No		
16	Clea	Dallender	cdallender@rakuten.co.jp	808-552-1583	3 Maple Wood Point	Honolulu	Hawaii	Female	Yes		
17	Rourke	Shobrook	rshobrookf@hostgator.com	860-155-2742	696 Mariners Cove Street	Hartford	Connecticut	Male	No		
18	Christie	Tolliday	ctolliday@blogtalkradio.com	505-993-3807	387 Fallview Alley	Albuquerque	New Mexico	Female	Yes		
19	Jesus	Brenston	jbrentonh@vistaprint.com	301-820-0042	69927 Swallow Parkway	Hyattsville	Maryland	Male	No		
20	Percy	Cattach	pcattachi@whitehouse.gov	850-945-2212	04019 Shopko Street	Pensacola	Florida	Male	Yes		
21	Eilette	Crew	ecrewj@slideshare.net	518-385-6839	70330 Sauthoff Point	Albany	New York	Female	No		
22	Caryl	Endecott	cendecottk@flavors.me	402-156-1704	190 Vernon Center	Omaha	Nebraska	Male	Yes		
23	Abbe	Race	arace@cam.ac.uk	239-151-9852	927 Sycamore Court	Fort Myers	Florida	Female	No		
24	Barnabas	Jubert	bjubertm@hatena.ne.jp	706-318-5897	2 Grasskamp Lane	Athens	Georgia	Male	Yes		
25	Karlene	Goldsworthy	kgoldsworthyh@hostgator.com	864-204-0107	276 Merry Way	Spartanburg	South Carolina	Female	No		
26	Erinn	Facey	efacey@google.pl	505-159-9362	894 Straubel Trail	Santa Fe	New Mexico	Female	Yes		
27	Dawn	Greschke	dgreschkep@drupal.org	281-389-4335	1771 Superior Parkway	Houston	Texas	Female	Yes		
28	Lonnie	Bemwell	lbemwell@surveymonkey.com	614-784-2444	2 Rusk Hill	Columbus	Ohio	Male	Yes		



Questions?

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How Does It Work?

HOW DOES MACHINE LEARNING WORK?

1. Get the Data

2. Pre-process
the data

3. Select the
algorithm and
train the model

4. Optimize the
model

5. Evaluate the
model

1. Get the Data



2. Pre-process the data



3. Select the algorithm and train the model



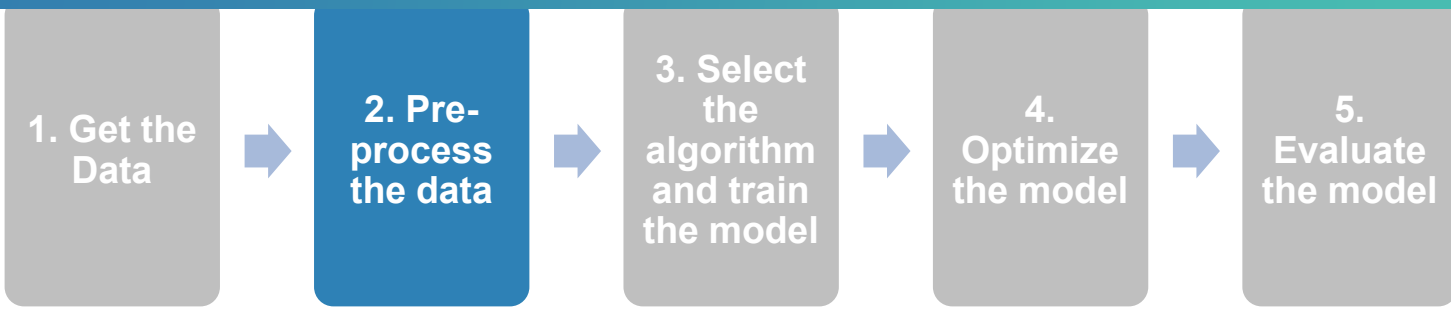
4. Optimize the model



5. Evaluate the model

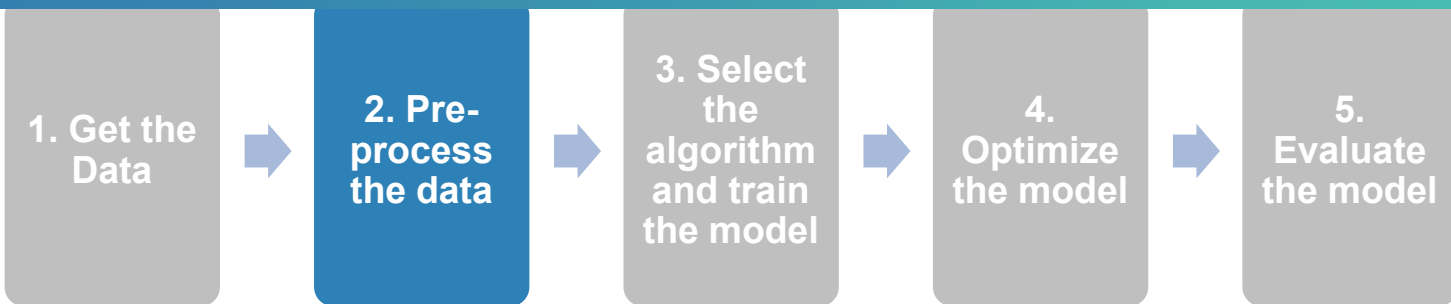
For predictions, you need labeled data.

	A	B	C	D	E	F	G	H	I	J	K
1	first_name	last_name	email	phone	address	city	state	gender			
2	Mirelle	Summerrell	msummerrell@eepurl.com	850-852-0213	08335 Heffernan Trail	Tallahassee	Florida	Female	Yes		
3	Tracey	Stoppe	tstoppe1@ucoz.ru	718-197-7133	0 Fieldstone Point	Brooklyn	New York	Female	No		
4	Gaylor	Longden	glongden2@mail.ru	917-340-9821	6 New Castle Circle	Bronx	New York	Male	Yes		
5	Becca	Beggan	bbeggan3@barnesandnoble.com	713-439-6223	96325 Lakeland Drive	Houston	Texas	Female	No		
6	Marika	Craghead	mcraghead4@exblog.jp	571-553-9696	96 Aberg Place	Arlington	Virginia	Female	Yes		
7	Richie	Strodger	rstrodger5@virginia.edu	202-559-0104	6 Sutherland Avenue	Washington	District of Columbi	Male	No		
8	Tandi	Okenden	tokenden6@tiny.cc	425-651-4534	03648 Stuart Parkway	Seattle	Washington	Female	Yes		
9	Gustaf	Hatje	ghatje7@marketwatch.com	702-306-2798	7 Hallows Hill	Las Vegas	Nevada	Male	No		
10	Ximenes	Kobelt	xkobelt8@amazonaws.com	423-350-7663	708 Melrose Parkway	Chattanooga	Tennessee	Male	Yes		
11	Wille	Kirkwood	wkirkwood9@soundcloud.com	602-430-4934	09 Doe Crossing Center	Phoenix	Arizona	Female	No		
12	Thorin	Gulik	tgulik@so-net.ne.jp	781-190-6862	8 Miller Avenue	Boston	Massachusetts	Male	Yes		
13	Leandra	Van Daalen	lvandaalenb@hao123.com	410-105-8749	2778 Coolidge Trail	Annapolis	Maryland	Female	Yes		
14	Christos	Chastey	chasteyc@mysql.com	530-199-9417	39167 Fordem Way	Sacramento	California	Male	Yes		
15	Reinaldos	Bullcock	rbullcock@geocities.jp	915-323-9182	5680 Briar Crest Court	El Paso	Texas	Male	No		
16	Clea	Dallender	cdallender@rakuten.co.jp	808-552-1583	3 Maple Wood Point	Honolulu	Hawaii	Female	Yes		
17	Rourke	Shobrook	rshobrookf@hostgator.com	860-155-2742	696 Mariners Cove Street	Hartford	Connecticut	Male	No		
18	Chrissie	Tolliday	ctollidayg@blogtalkradio.com	505-993-3807	387 Fallview Alley	Albuquerque	New Mexico	Female	Yes		
19	Jesus	Brenston	jbrenstonh@vistaprint.com	301-820-0042	69927 Swallow Parkway	Hyattsville	Maryland	Male	No		
20	Percy	Cattach	pcattachi@whitehouse.gov	850-945-2212	04019 Shopko Street	Pensacola	Florida	Male	Yes		
21	Ellette	Crew	ecrewj@slideshare.net	518-385-6839	70330 Sauthoff Point	Albany	New York	Female	No		
22	Caryl	Endecott	cendecottk@flavors.me	402-156-1704	190 Vernon Center	Omaha	Nebraska	Male	Yes		
23	Abbe	Race	aracej@cam.ac.uk	239-151-9852	927 Sycamore Court	Fort Myers	Florida	Female	No		
24	Barnabas	Jubert	bjubertm@hatena.ne.jp	706-318-5897	2 Grasskamp Lane	Athens	Georgia	Male	Yes		
25	Karlene	Goldsworthy	kgoldsworthyh@hostgator.com	864-204-0107	276 Merry Way	Spartanburg	South Carolina	Female	No		
26	Erinn	Facey	efacey@google.pl	505-159-9362	894 Straubel Trail	Santa Fe	New Mexico	Female	Yes		
27	Dawn	Greschke	dgreschkep@drupal.org	281-389-4335	1771 Superior Parkway	Houston	Texas	Female	Yes		
28	Lonnie	Bemwell	lbemwellq@surveymonkey.com	614-784-2444	2 Rusk Hill	Columbus	Ohio	Male	Yes		



- Deal with messy data
- Identify what you want to predict (dependent target value/label) and what you want to use to make that prediction (independent attributes)
- Split data set: (1) training; (2) validation; (3) testing.

1	A	B	C	D	E	F	G	H	I	J	K
1	first_name	last_name	email	phone	address	city	state	gender		Column1	Column2
2	Mirelle	Summerrell	msummerrell@beepurl.com	850-852-0213	08335 Heffernan Trail	Tallahassee	Florida	Female		Yes	
3	Tracey	Stogge	tstogge1@ozcu.ru	718-197-7133	0 Fieldstone Point	Brooklyn	New York	Female		No	
4	Gaylor	Longden	glongden2@gmail.ru	917-340-9821	6 New Castle Circle	Bronx	New York	Male		Yes	
5	Becca	Beggan	bbeggan3@barnesandnoble.com	713-439-6223	96325 Lakeland Drive	Houston	Texas	Female		No	
6	Marika	Craghead	mcraghead4@exblog.jp	571-553-9696	96 Aberg Place	Arlington	Virginia	Female		Yes	
7	Richie	Stroder	rstroder5@virginia.edu	202-559-0104	6 Sutherland Avenue	Washington	District of Columbia	Male		No	
8	Tandi	Okenden	tokenden6@tin.cc	425-651-4534	03648 Stuart Parkway	Seattle	Washington	Female		Yes	
9	Willie	Kirkwood	wkirkwood9@soundcloud.com	602-430-4934	09 Doe Crossing Center	Phoenix	Arizona	Female		No	
12	Thorin	Gulik	tgulik@so-net.ne.jp	781-190-6862	8 Miller Avenue	Boston	Massachusetts	Male		Yes	
13	Leandra	Van Daalen	lvandaalen@haz123.com	410-105-8749	2778 Coolidge Trail	Annapolis	Maryland	Female		Yes	
14	Christos	Chasteay	chasteayc@mysq.com	530-199-9417	39167 Fordem Way	Sacramento	California	Male		Yes	
15	Reinaldos	Bulcock	rbulcockd@geocities.jp	915-323-9182	5680 Briar Crest Court	El Paso	Texas	Male		No	
16	Clea	Dallender	cdallender@rakuten.co.jp	808-552-1583	3 Maple Wood Point	Honolulu	Hawaii	Female		Yes	
17	Rourke	Shobrock	rshobrockf@hostgator.com	860-155-2742	696 Mariners Cove Street	Hartford	Connecticut	Male		No	
18	Chrissie	Tolliday	ctollidayg@blogtalkradio.com	505-993-3807	387 Fallview Alley	Albuquerque	New Mexico	Female		Yes	
19	Jesus	Brenston	jbrenstonh@vistaprint.com	301-820-0042	69927 Swallow Parkway	Hyattsville	Maryland	Male		No	
20	Percy	Cattach	pcattachi@whitehouse.gov	850-945-2212	04019 Shopko Street	Pensacola	Florida	Male		Yes	
24	Barnabas	Jubert	bjubert@hateran.ne.jp	706-318-5897	2 Grasskamp Lane	Athens	Georgia	Male		Yes	
25	Karlene	Goldsworthy	kgoldsworthyh@hostgator.com	864-204-0107	276 Merry Way	Spartanburg	South Carolina	Female		No	
26	Erinn	Facey	efacey@google.pl	505-159-9362	894 Straubel Trail	Santa Fe	New Mexico	Female		Yes	
27	Dawn	Greschke	dgreschkep@drupal.org	281-389-4335	1771 Superior Parkway	Houston	Texas	Female		Yes	
28	Lonnie	Bemwell	lbemwell@surveymonkey.com	614-784-2444	2 Rusk Hill	Columbus	Ohio	Male		Yes	



- Deal with messy data
- Identify what you want to predict (dependent target value/label) and what you want to use to make that prediction (independent attributes)
- Split data set: (1) training; (2) validation; (3) testing.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1	One	Account	last	name	email	phone	address	city	state	gender	attended	date	columns	columns						
2	John	John	John	John	John	John	John	John	John	John	John	John	John	John	John	John	John	John	John	John

TRAINING SET

9	James	James	James	James	James	James	James	James	James	James	James	James	James	James	James	James	James	James	James	James
---	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

VALIDATION SET

10	David	David	David	David	David	David	David	David	David	David	David	David	David	David	David	David	David	David	David	David
----	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

TESTING SET

11	Erica	Erica	Erica	Erica	Erica	Erica	Erica	Erica	Erica	Erica	Erica	Erica	Erica	Erica	Erica	Erica	Erica	Erica	Erica	Erica
----	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

1. Get the Data



2. Pre-process the data



3. Select the algorithm and train the model



4. Optimize the model



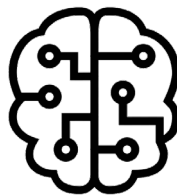
5. Evaluate the model



ID	Name	Address	City	State	Gender	Admitted (Y/N)	Chronic	Control
1	Shirley	Summer@houston.com	830-562-2113	6831 Jefferson Trail	Tulsa	Female	No	
2	Henry	Henry@houston.com	728-287-7128	47 Anderson Road	Boston	Male	Yes	
3	Angela	Angela@houston.com	851-245-8611	1 New York Circle	NY	Female	No	
4	Kevin	Kevin@houston.com	714-438-8219	1615 Lakeland Drive	Houston	Male	Yes	
5	Mark	Mark@houston.com	515-555-5686	800 West 19th	Albuquerque	Male	No	
6	John	John@houston.com	202-558-5558	4 Northland Avenue	Washington	Male	No	
7	David	David@houston.com	415-555-5686	1848 West 19th	San Diego	Male	No	
8	Paul	Paul@houston.com	702-306-2788	7 Holmes Hill	Las Vegas	Male	Yes	
9	Robert	Robert@houston.com	415-555-5686	780 West 19th	San Diego	Male	Yes	
10	John	John@houston.com	402-430-4834	49 Dow Crossing Center	Phoenix	Male	Yes	
11	John	John@houston.com	415-555-5686	4 Ande Avenue	Boston	Male	Yes	
12	Christina	Christina@houston.com	452-105-8129	2778 Condit Trail	Albuquerque	Female	Yes	
13	Christina	Christina@houston.com	343-349-8427	2522 Hudson Way	San Francisco	Female	Yes	
14	Arabella	Arabella@houston.com	513-323-8182	3488 New Crest Court	El Paso	Female	Yes	
15	John	John@houston.com	848-555-5686	1 Maple Wood Drive	Honolulu	Male	Yes	
16	Kevin	Kevin@houston.com	848-555-5686	188 Matthews Drive	Honolulu	Male	No	
17	John	John@houston.com	505-555-5686	1877 Fanny Alley	Albuquerque	Male	Yes	
18	John	John@houston.com	505-555-5686	1877 Fanny Alley	Albuquerque	Male	Yes	
19	John	John@houston.com	830-562-2113	3402 Douglas Street	Houston	Male	Yes	
20	John	John@houston.com	515-555-5686	7022 Lakeland Drive	Albuquerque	Male	Yes	
21	Carl	Carl@houston.com	402-558-5558	180 Vernon Center	Owensboro	Male	Yes	
22	John	John@houston.com	215-212-8822	187 Spangway Court	Kent Hills	Female	No	
23	Barbara	Barbara@houston.com	704-558-5887	1 Spangway Lane	Atlanta	Female	Yes	
24	John	John@houston.com	408-504-8587	178 Nancy Way	Springfield	Female	Yes	
25	John	John@houston.com	505-558-5882	894 Stroud Trail	San Francisco	Female	Yes	
26	John	John@houston.com	202-558-5686	1715 Spangway Parkway	Houston	Female	Yes	
27	John	John@houston.com	215-212-8822	2 Rock Hill	Columbus	Male	Yes	

ALGORITHM

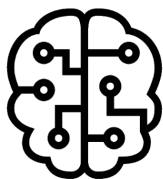
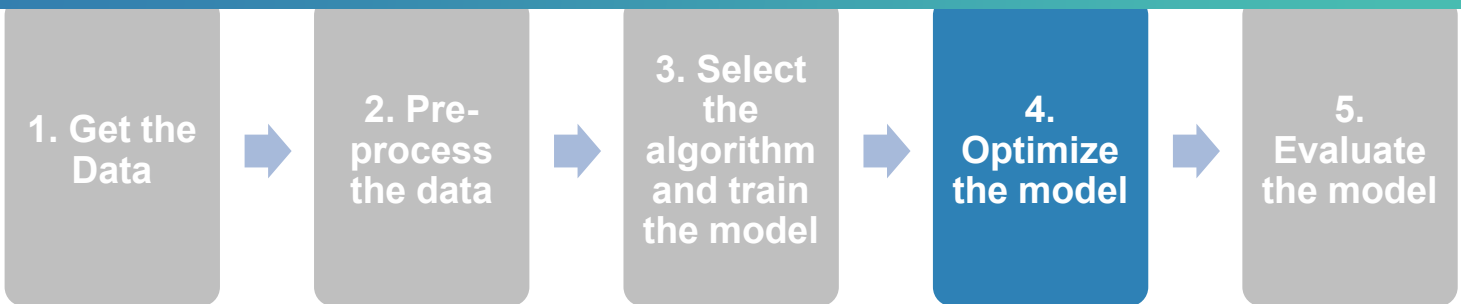
TRAINING DATA SET



MODEL

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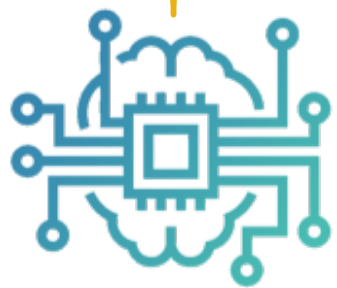


MODEL



9	Gustaf	Harp	gharf@marlinetech.com	702-355-2788	7 Hollow Hill	Las Vegas	Nevada	Male	Yes
10	James	Kneib	ckneib@onecause.com	612-350-7063	788 Ashwood Parkside	Chattanooga	Tennessee	Male	Yes
11	Wade	Kirkwood	wkirkwood@poundcloud.com	602-430-8934	09 Deer Crossing Center	Phoenix	Arizona	Female	No
12	Thom	Dele	gdele@oneca.gov	781-288-0865	818 Maple Avenue	Boston	Massachusetts	Male	Yes
13	Leandra	Van Dusen	lvandusen@huc22.com	410-525-8748	2778 Coalidge Trail	Annapolis	Maryland	Female	Yes
14	Devin	Cheney	cheneyd@nyed.com	516-289-9147	15127 Forest Lane	San Francisco	California	Male	Yes
15	Renaldo	Ballock	rballock@oneca.gov	815-223-9122	1240 East Great Court	El Paso	Texas	Male	No
16	Chen	Dubendor	cdubendor@alumni.edu	800-253-1285	3 Maple Woods Road	Ann Arbor	Michigan	Female	No
17	Ronita	Dubonick	rdubonick@oneca.gov	800-253-2742	686 Mariners Cove Street	Hartford	Connecticut	Male	No
18	Cherie	Tobley	ctobley@hugoboss.com	202-943-3882	307 Fallow Alley	Albuquerque	New Mexico	Female	Yes
19	Eric	Benson	eric@oneca.gov	301-620-0465	69027 Inverline Parkway	Hyattsville	Maryland	Male	No
20	Perry	Cattach	pcattach@whitehouse.gov	800-945-2212	09019 Shookle Street	Pompano	Florida	Male	Yes

VALIDATION DATA SET



OPTIMIZED MODEL

1. Get the Data



2. Pre-process the data



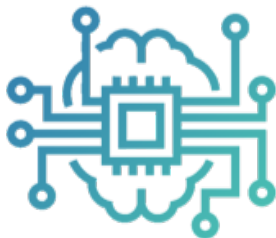
3. Select the algorithm and train the model



4. Optimize the model



5. Evaluate the model



OPTIMIZED MODEL



21	Ellete	Crow	ecrow@hdsnhare.net	518-385-6839	70330 Southoff Point	Albany	New York	Female		
22	Caryl	Fidolelli	anfidoelli@sunysp1.net	402-556-1704	285 Vernon Center	Omaha	Nebraska	Male		
23	Abbe	Race	arace@tam.ac.uk	239-151-9852	937 Spycamore Court	Fort Myers	Florida	Female		
24	Barnabas	Jakoff	bjakoff@pharmax.net	706-318-8897	2 Goussip Lane	Atlanta	Georgia	Male		
25	Karlene	Goldsworthy	kgoldsworthy@hanger.com	884-104-0107	276 Merry Way	Spartanburg	South Carolina	Female		
26	Erin	Racey	eracey@google.pl	505-159-9362	894 Strachal Trail	Santa Fe	New Mexico	Female		
27	Dawn	Gruschke	dgruschke@psd.org	281-489-4335	1771 Superior Parkway	Houston	Texas	Female		
28	Lennie	Berwell	berwell@sunnymonkey.com	614-784-2444	2 Ruak Hill	Columbus	Ohio	Male		

TESTING DATA SET

21	Ellete	Crow	ecrow@hdsnhare.net	518-385-6839	70330 Southoff Point	Albany	New York	Female	No	
22	Caryl	Fidolelli	anfidoelli@sunysp1.net	402-556-1704	285 Vernon Center	Omaha	Nebraska	Male	Yes	
23	Abbe	Race	arace@tam.ac.uk	239-151-9852	937 Spycamore Court	Fort Myers	Florida	Female	Yes	
24	Barnabas	Jakoff	bjakoff@pharmax.net	706-318-8897	2 Goussip Lane	Atlanta	Georgia	Male	Yes	
25	Karlene	Goldsworthy	kgoldsworthy@hanger.com	884-104-0107	276 Merry Way	Spartanburg	South Carolina	Female	No	
26	Erin	Racey	eracey@google.pl	505-159-9362	894 Strachal Trail	Santa Fe	New Mexico	Female	Yes	
27	Dawn	Gruschke	dgruschke@psd.org	281-489-4335	1771 Superior Parkway	Houston	Texas	Female	Yes	
28	Lennie	Berwell	berwell@sunnymonkey.com	614-784-2444	2 Ruak Hill	Columbus	Ohio	Male	Yes	

VS

21	Ellete	Crow	ecrow@hdsnhare.net	518-385-6839	70330 Southoff Point	Albany	New York	Female	No	
22	Caryl	Fidolelli	anfidoelli@sunysp1.net	402-556-1704	285 Vernon Center	Omaha	Nebraska	Male	Yes	
23	Abbe	Race	arace@tam.ac.uk	239-151-9852	937 Spycamore Court	Fort Myers	Florida	Female	No	
24	Barnabas	Jakoff	bjakoff@pharmax.net	706-318-8897	2 Goussip Lane	Atlanta	Georgia	Male	Yes	
25	Karlene	Goldsworthy	kgoldsworthy@hanger.com	884-104-0107	276 Merry Way	Spartanburg	South Carolina	Female	No	
26	Erin	Racey	eracey@google.pl	505-159-9362	894 Strachal Trail	Santa Fe	New Mexico	Female	Yes	
27	Dawn	Gruschke	dgruschke@psd.org	281-489-4335	1771 Superior Parkway	Houston	Texas	Female	Yes	
28	Lennie	Berwell	berwell@sunnymonkey.com	614-784-2444	2 Ruak Hill	Columbus	Ohio	Male	Yes	

PREDICTED RESULTS

ACTUAL RESULTS



HOW AI CAN IMPROVE
PEER-TO-PEER

(AND OTHER NONPROFIT FUNDRAISING EFFORTS)



8 WAYS TO USE AI

1. Peer-to-Peer Fundraising
2. Board Fundraising
3. Capital Campaigns
4. Direct Mail
5. Email Campaigns
6. Crowdfunding
7. Gala Events
8. “A-thons”





Questions?

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POWERFUL FUNDRAISING SOLUTIONS



info@onecause.com
www.onecause.com

888.729.0399