

# Clean Earth

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# Project Overview



 01 PET	Polyethylene terephthalate (PET, PETE)	Clarity, strength, toughness, barrier to gas and moisture.	Soft drink, water and salad dressing bottles; peanut butter and jam jars; ice cream cone lids; small consumer electronics	Tm = 250; <sup>[62]</sup> Tg = 76 <sup>[62]</sup>	2–2.7 <sup>[63]</sup>
 02 PE-HD	High-density polyethylene (HDPE)	Stiffness, strength, toughness, resistance to moisture, permeability to gas	Water pipes <sup>[2]</sup> , Gas & Fire Pipelines <sup>[2]</sup> , Electrical & Communications conduit; <sup>[64]</sup> hula hoop rings, five gallon buckets, milk, juice and water bottles, grocery bags, some shampoo/toiletry bottles	Tm = 130; <sup>[65]</sup> Tg = -125 <sup>[66]</sup>	0.8 <sup>[63]</sup>
 03 PVC	Polyvinyl chloride (PVC)	Versatility, ease of blending, strength, toughness.	Blistер packaging for non-food items; cling films for non-food use. May be used for food packaging with the addition of the plasticisers needed to make natively rigid PVC flexible. Non-packaging uses are electrical cable insulation; rigid piping, vinyl records.	Tm = 240; <sup>[67]</sup> Tg = 85 <sup>[67]</sup>	2.4–4.1 <sup>[68]</sup>
 04 PE-LD	Low-density polyethylene (LDPE)	Ease of processing, strength, toughness, flexibility, ease of sealing, barrier to moisture.	Frozen food bags; squeezable bottles, e.g. honey, mustard; cling films; flexible container lids	Tm = 120; <sup>[69]</sup> Tg = -125 <sup>[70]</sup>	0.17–0.28 <sup>[69]</sup>
 05 PP	Polypropylene (PP)	Strength, toughness, resistance to heat, chemicals, grease and oil, versatile, barrier to moisture.	Reusable microwavable ware; kitchenware; yogurt containers; margarine tubs; microwaveable disposable take-away containers; disposable cups; soft drink bottle caps; plates.	Tm = 173; <sup>[71]</sup> Tg = -10 <sup>[71]</sup>	1.5–2 <sup>[63]</sup>
 06 PS	Polystyrene (PS)	Versatility, clarity, easily formed	Egg cartons; packing peanuts; disposable cups, plates, trays and cutlery; disposable take-away containers	Tm = 240 (only isotactic); <sup>[65]</sup> Tg = 100 (atactic and isotactic) <sup>[65]</sup>	3–3.5 <sup>[63]</sup>
 07 Other (often polycarbonate)	Dependent on polymers or combination of polymers	Beverage bottles, baby milk bottles. Non-packaging uses for polycarbonate, compact discs, "unbreakable" glazing, electronic apparatus housing, lenses (including sunglasses).	Polycarbonate: Tg = 145; <sup>[73]</sup> Tm = 225 <sup>[74]</sup>	Polycarbonate: 2.6; <sup>[63]</sup> ABS	



# How our project will help to solve it?

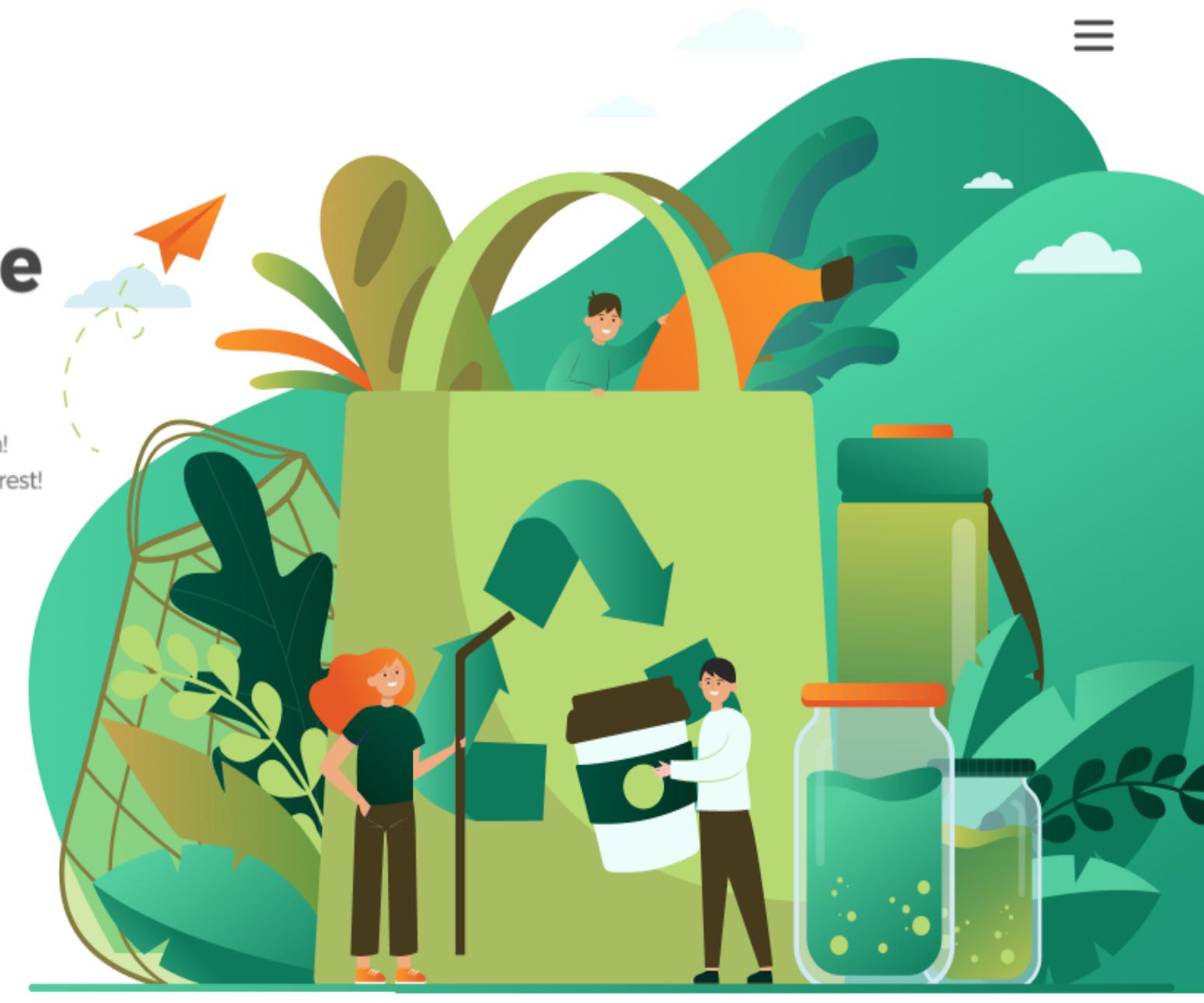
DEMO



# together we can restore the planet

Disposing garbage was never this easy and fun!  
Just upload your bill and we'll take care of the rest!

Upload Your Bill Now





# together we can restore the planet

Disposing garbage was never this easy and fun!  
Just upload your bill and we'll take care of the rest!

Upload Your Bill Now



X

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# together we can restore the planet

Disposing garbage was never this easy and fun!  
Just upload your bill and we'll take care of the rest!

✓ Upload complete!



great!  
here are your items

**recyclable**

- Milk carton
- Notebooks
- Dr. Pepper's

**non-recyclable**

- Plastic cups
- Plastic bags
- LED Bulb

If some items are missing, [click here](#) to add more.

 View nearby Smart Bins

 Scan Smart Bin



find your nearest  
**smart bin** to dispose  
waste into



**ready?  
choose the items that you  
want to dump**

**recyclable**

- Milk Carton
- Notebook
- Dr. Pepper's

Proceed →



# hooray!

## you've earned 20EP!

Thank you for using our service! You've helped save the planet. You're awesome!



Upload Another Bill



# Technologies Used

- ▶ Python
- ▶ Google Cloud Platform
- ▶ HTML, CSS, Bootstrap, Javascript
- ▶ OpenCV



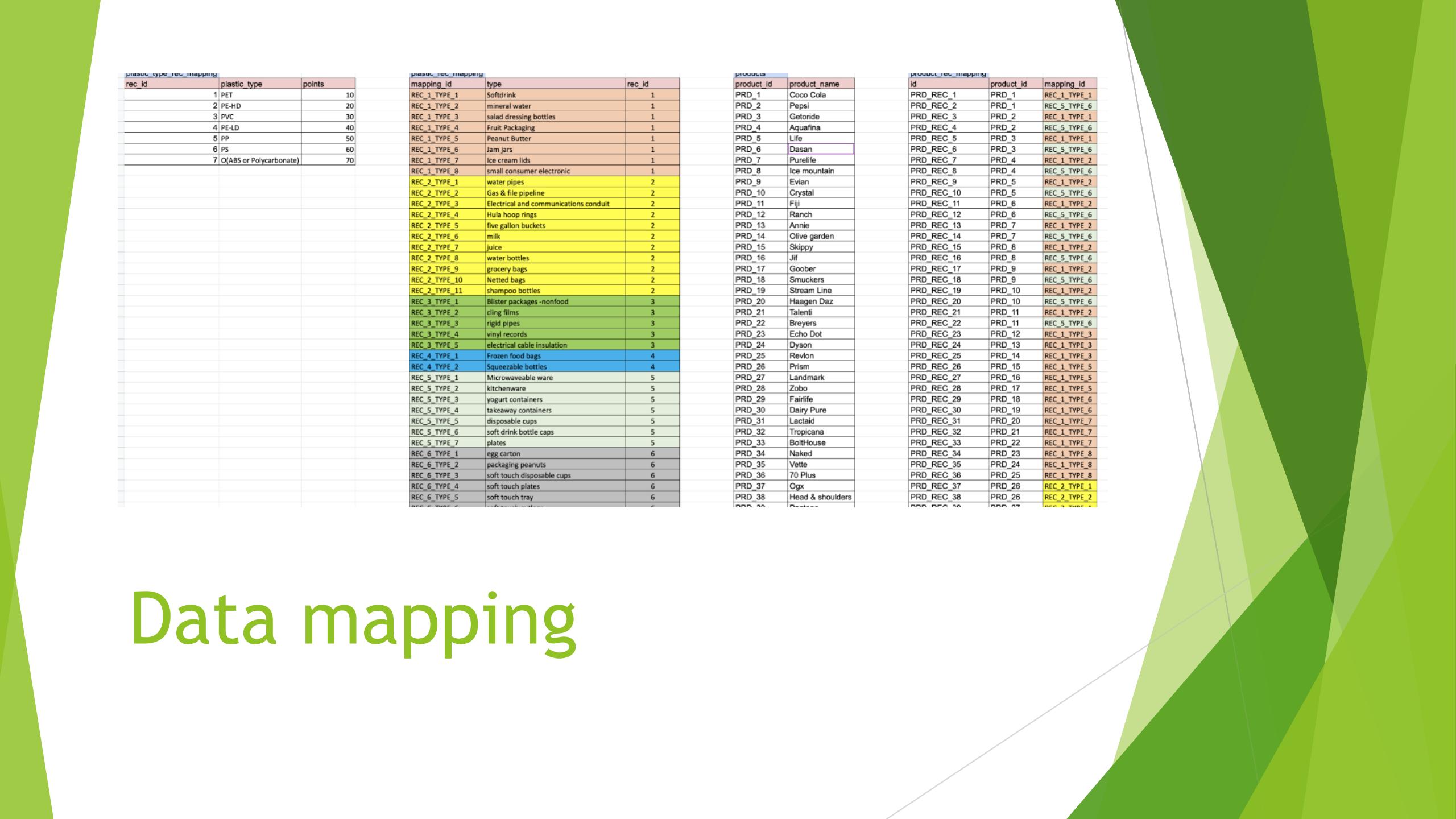
0	list	2	[ 'BOLTHOUSE', 1 ]
1	list	2	[ 'GG FRUIT', 1 ]
2	list	2	[ 'STRAWBERRIES', 1 ]
3	list	2	[ 'BLACKBERRIES', 1 ]
4	list	2	[ 'LB ORGANIC', 1 ]
5	list	2	[ 'AIM T', 1 ]

# Text retrieval



Index	Type	Size	Value
0	list	2	[''Heinz'', '1']
1	list	2	[''Zobo'', '1']
2	list	2	[''Echo Dot'', '1']
3	list	2	[''Annie'', '2']
4	list	2	[''Dasan'', '2']

# Bar Code Scan



plastic_type_rec_mapping		
rec_id	plastic_type	points
1	PET	10
2	PE-HD	20
3	PVC	30
4	PE-LD	40
5	PP	50
6	PS	60
7	O(ABS or Polycarbonate)	70

plastic_rec_mapping		
mapping_id	type	rec_id
REC_1_TYPE_1	Softdrink	1
REC_1_TYPE_2	mineral water	1
REC_1_TYPE_3	salad dressing bottles	1
REC_1_TYPE_4	Fruit Packaging	1
REC_1_TYPE_5	Peanut Butter	1
REC_1_TYPE_6	Jam jars	1
REC_1_TYPE_7	Ice cream lids	1
REC_1_TYPE_8	small consumer electronic	1
REC_2_TYPE_1	water pipes	2
REC_2_TYPE_2	Gas & file pipeline	2
REC_2_TYPE_3	Electrical and communications conduit	2
REC_2_TYPE_4	Hula hoop rings	2
REC_2_TYPE_5	five gallon buckets	2
REC_2_TYPE_6	milk	2
REC_2_TYPE_7	juice	2
REC_2_TYPE_8	water bottles	2
REC_2_TYPE_9	grocery bags	2
REC_2_TYPE_10	Netted bags	2
REC_2_TYPE_11	shampoo bottles	2
REC_3_TYPE_1	Blister packages -nonfood	3
REC_3_TYPE_2	cling films	3
REC_3_TYPE_3	rigid pipes	3
REC_3_TYPE_4	vinyl records	3
REC_3_TYPE_5	electrical cable insulation	3
REC_4_TYPE_1	Frozen food bags	4
REC_4_TYPE_2	Squeezable bottles	4
REC_5_TYPE_1	Microwaveable ware	5
REC_5_TYPE_2	kitchenware	5
REC_5_TYPE_3	yogurt containers	5
REC_5_TYPE_4	takeaway containers	5
REC_5_TYPE_5	disposable cups	5
REC_5_TYPE_6	soft drink bottle caps	5
REC_5_TYPE_7	plates	5
REC_6_TYPE_1	egg carton	6
REC_6_TYPE_2	packaging peanuts	6
REC_6_TYPE_3	soft touch disposable cups	6
REC_6_TYPE_4	soft touch plates	6
REC_6_TYPE_5	soft touch tray	6

products	
product_id	product_name
PRD_1	Coco Cola
PRD_2	Pepsi
PRD_3	Getoride
PRD_4	Aquafina
PRD_5	Life
PRD_6	Dasan
PRD_7	Purelife
PRD_8	Ice mountain
PRD_9	Evian
PRD_10	Crystal
PRD_11	Fiji
PRD_12	Ranch
PRD_13	Annie
PRD_14	Olive garden
PRD_15	Skippy
PRD_16	Jif
PRD_17	Goober
PRD_18	Smuckers
PRD_19	Stream Line
PRD_20	Haagen Daz
PRD_21	Talenti
PRD_22	Breyers
PRD_23	Echo Dot
PRD_24	Dyson
PRD_25	Revlon
PRD_26	Prism
PRD_27	Landmark
PRD_28	Zobo
PRD_29	Fairlife
PRD_30	Dairy Pure
PRD_31	Lactaid
PRD_32	Tropicana
PRD_33	BoltHouse
PRD_34	Naked
PRD_35	Vette
PRD_36	70 Plus
PRD_37	Ogx
PRD_38	Head & shoulders
PRD_39	Rebisco

product_rec_mapping		
id	product_id	mapping_id
PRD_REC_1	PRD_1	REC_1_TYPE_1
PRD_REC_2	PRD_1	REC_5_TYPE_6
PRD_REC_3	PRD_2	REC_1_TYPE_1
PRD_REC_4	PRD_2	REC_5_TYPE_6
PRD_REC_5	PRD_3	REC_1_TYPE_1
PRD_REC_6	PRD_3	REC_5_TYPE_6
PRD_REC_7	PRD_4	REC_1_TYPE_2
PRD_REC_8	PRD_4	REC_5_TYPE_6
PRD_REC_9	PRD_5	REC_1_TYPE_2
PRD_REC_10	PRD_5	REC_5_TYPE_6
PRD_REC_11	PRD_6	REC_1_TYPE_2
PRD_REC_12	PRD_6	REC_5_TYPE_6
PRD_REC_13	PRD_7	REC_1_TYPE_2
PRD_REC_14	PRD_7	REC_5_TYPE_6
PRD_REC_15	PRD_8	REC_1_TYPE_2
PRD_REC_16	PRD_8	REC_5_TYPE_6
PRD_REC_17	PRD_9	REC_1_TYPE_2
PRD_REC_18	PRD_9	REC_5_TYPE_6
PRD_REC_19	PRD_10	REC_1_TYPE_2
PRD_REC_20	PRD_10	REC_5_TYPE_6
PRD_REC_21	PRD_11	REC_1_TYPE_2
PRD_REC_22	PRD_11	REC_5_TYPE_6
PRD_REC_23	PRD_12	REC_1_TYPE_3
PRD_REC_24	PRD_13	REC_1_TYPE_3
PRD_REC_25	PRD_14	REC_1_TYPE_3
PRD_REC_26	PRD_15	REC_1_TYPE_5
PRD_REC_27	PRD_16	REC_1_TYPE_5
PRD_REC_28	PRD_17	REC_1_TYPE_5
PRD_REC_29	PRD_18	REC_1_TYPE_6
PRD_REC_30	PRD_19	REC_1_TYPE_6
PRD_REC_31	PRD_20	REC_1_TYPE_7
PRD_REC_32	PRD_21	REC_1_TYPE_7
PRD_REC_33	PRD_22	REC_1_TYPE_7
PRD_REC_34	PRD_23	REC_1_TYPE_8
PRD_REC_35	PRD_24	REC_1_TYPE_8
PRD_REC_36	PRD_25	REC_1_TYPE_8
PRD_REC_37	PRD_26	REC_2_TYPE_1
PRD_REC_38	PRD_26	REC_2_TYPE_2
PRD_REC_39	PRD_27	REC_2_TYPE_2

# Data mapping

# Google Cloud Platform

The screenshot shows the Google Cloud Platform SQL Databases interface. On the left, a sidebar menu for the 'hackathon-cloud' project is visible, with 'Databases' selected. The main area displays the 'MASTER INSTANCE' for the 'hackerrank' database, which is running MySQL 5.7. A 'CREATE DATABASE' button is present. Below it, a table lists system databases:

Name	Collation	Character set	Type
information_schema	utf8_general_ci	utf8	System
mysql	utf8_general_ci	utf8	System
performance_schema	utf8_general_ci	utf8	System
save_earth	utf8_general_ci	utf8	User
sys	utf8_general_ci	utf8	User

At the bottom, a terminal window titled '(hackathon-cloud-291419)' shows the MySQL monitor output:

```
Connecting to database with SQL user [root].Enter password:  
Welcome to the MySQL monitor. Commands end with ; or \g.  
Your MySQL connection id is 6540  
Server version: 5.7.25-google-log (Google)  
  
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affiliates. Other names may be trademarks of their respective  
owners.  
  
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
mysql> █
```

# Google Cloud Platform

The screenshot shows the Google Cloud Platform SQL Overview page for a master instance named "hackathon-cloud-291419:us-west2:hackerrank".

**Master Instance Overview:**

- Connection name:** hackathon-cloud-291419:us-west2:hackerrank
- Suggested actions:**
  - Enable high availability
- Service account:** (hackathon-cloud-291419)

**Instance Configuration:**

- Database version is MySQL 5.7
- Auto storage increase is enabled
- Automated backups are enabled
- Point-in-time recovery is enabled
- Located in us-west2-b
- Not highly available (zonal)
- No database flags set
- No labels set

**Actions:**

- EDIT
- IMPORT
- EXPORT
- RESTART
- STOP
- DELETE
- CLONE

**Terminal:**

```
Connecting to database with SQL user [root]. Enter password:  
Welcome to the MySQL monitor. Commands end with ; or \g.  
Your MySQL connection id is 6540  
Server version: 5.7.25-google-log (Google)  
  
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affiliates. Other names may be trademarks of their respective  
owners.  
  
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
mysql> 
```

```
mysql> select * from products;
+-----+-----+
| product_id | product_name   |
+-----+-----+
| PRD_1      | Coca Cola    |
| PRD_1      | Coca Cola    |
| PRD_2      | Pepsi         |
| PRD_3      | Getoride      |
| PRD_4      | Aquafina      |
| PRD_5      | Life          |
| PRD_6      | Dasan         |
| PRD_7      | Purelife      |
| PRD_8      | Ice mountain  |

```

# GCP MySQL table

GET https://hackathon-cloud-291419.wl.r.appspot.com/details

Params Authorization Headers (6) Body Pre-request Script Tests Settings

Query Params

KEY	VALUE	DESCRIPTION
Key	Value	Description

Body Cookies Headers (9) Test Results Status: 200 OK Time:

Pretty Raw Preview Visualize JSON

```
1 [
2   {
3     "points": "60",
4     "recyclable": "ANNIE",
5     "unclassified": null
6   },
7   {
8     "points": "120",
9     "recyclable": "BOLTHOUSE",
10    "unclassified": null
11  },
12  {
13    "points": "30",
14    "recyclable": "Coca Cola",
15    "unclassified": null
16  },
17  {
18    "points": "70",
19    "recyclable": "DASAN",
20    "unclassified": null
21  },
22  {
23    "points": "60",
24    "recyclable": "ECHO DOT",
25    "unclassified": null
26  }
27 ]
```

API  
hosted  
on GCP



Thank you!