

My system works by first executing the driver module, main.py. This module first gathers the necessary file names from the user, and then instantiates a new DataHandler object to read in and process the data for those files. Once the data is returned to the caller (main), a PreferenceProblem object is instantiated which holds the key data for the project—Objects, Hard Constraints, Penalty Logics, and Qualitative Choice Logics. Main then calls the display_menu method which prints out the preference problem options to the user. When a certain option is pressed, an instance method from PreferenceProblem is executed which displays the result of that option to the user.

Below are a few images of my program using the TestCase directory developed by me.

Penalty Logic:

```
main.py
4. Exemplification
5. Omni-optimization
6. Back to previous menu
Your Choice: 2
Yes, there are 52 feasible objects.
Choose the reasoning task to perform:
1. Encoding
2. Feasibility Checking
3. Show the Table
4. Exemplification
5. Omni-optimization
6. Back to previous menu
Your Choice: 4
Two randomly selected feasible objects are o176 and o246,
o176 and o246 are equivalent.
Choose the reasoning task to perform:
1. Encoding
2. Feasibility Checking
3. Show the Table
4. Exemplification
5. Omni-optimization
6. Back to previous menu
Your Choice: 5
All optimal objects: o176, o177, o178, o179, o180, o182, o198, o288, o289, o212, o228, o248, o241, o242, o243, o244, o254
Choose the reasoning task to perform:
```

encoding	pikachu AND charizard	dugtrio OR pidgeot OR oddish	zapdos OR tyranitar AND NOT pidgeot	total penalty
o33	6	0	10	16
o35	6	0	10	16
o37	6	0	10	16
o39	6	0	10	16
o45	6	2	10	18
o47	6	0	10	16
o49	6	0	10	16
o51	6	0	10	16
o65	6	0	10	16
o81	6	0	10	16
o97	6	0	10	16
o99	6	0	10	16
o113	6	0	10	16
o115	6	0	10	16
o168	6	0	10	16
o161	6	0	10	16
o162	6	0	10	16
o163	6	0	10	16
o164	6	0	10	16
o165	6	0	10	16
o166	6	0	10	16
o167	6	0	10	16

Qualitative Choice Logic:

```
main.py
5. Exemplification
5. Omni-optimization
6. Back to previous menu
Your Choice: 2
Yes, there are 52 feasible objects.
Choose the reasoning task to perform:
1. Encoding
2. Feasibility Checking
3. Show the Table
4. Exemplification
5. Omni-optimization
6. Back to previous menu
Your Choice: 4
Two randomly selected feasible objects are o220 and o180,
and o220 and o180 are equal.
Choose the reasoning task to perform:
1. Encoding
2. Feasibility Checking
3. Show the Table
4. Exemplification
5. Omni-optimization
6. Back to previous menu
Your Choice: 5
All optimal objects: o164, o172
Choose the reasoning task to perform:
```

encoding	zapdos BT pikachu IF	lugia AND charizard BT pidgeot AND magmar IF	mewtwo BT jynx IF tyranitar
o33	1	inf	inf
o35	1	2	inf
o37	1	inf	inf
o39	1	2	inf
o45	1	inf	inf
o47	1	2	inf
o49	2	inf	inf
o51	2	2	inf
o65	1	inf	inf
o81	2	inf	inf
o97	1	inf	inf
o99	1	2	inf
o113	2	inf	inf
o115	2	2	inf
o168	1	1	2
o161	1	1	inf
o162	1	inf	2
o163	1	inf	inf
o164	1	1	1
o165	1	1	inf
o166	1	inf	1
o167	1	inf	inf