Summer school on Decisions, Law, and the Big Data Revolution

Syllabus:

1. Introduction to Python programming (overview, basic syntax, variable types, containers, objects, data structures).
2. Data Management in Python with Pandas
3. Introduction and basic methods in machine learning (Learning Framework, Linear Regression, Logistic Regression, Model Selection with Cross-validation, Decision Trees, Bootstrapping, Random Forests, Gradient Boosting)
4. Collaborative filtering (framework, basic neighborhood methods, basic model-based methods)
5. Behavioral experiments programming.
6. Implications of big data revolution to law and enforcement
7. Choice prediction competitions

Notes:

1. Participants are required to bring and work on their personal computers (the course will be conducted in a regular classroom).
2. Participants are required to install the relevant software for using Python (on their personal computers) before the beginning of the course. Installation instructions were submitted separately.
3. Tentative schedule follows. Actual times (particularly of breaks) may vary.
4. Most hands-on work will be done using the Choice Prediction Competition data (510,000 observations of economic choices made by humans in the lab).
5. Materials will be distributed in due course.

Course Schedule

Date	Time	Event
20/8/17 (Sun)	7:30	Bus #1 from airport to the dorms
	10:00	Bus #2 from airport to the dorms
	12:00 – 13:00	Reception and lunch (2nd floor in Bloomfield Bldg, Technion; Waze users: navigate to California Visitors Center, Haifa)
	13:00 – 13:15	**Welcome notes** - Ido Erev
	13:15 – 14:30, 14:45 – 16:00, 16:15 – 17:40	**Introduction to Python Programming (I)** - Alex Shleyfman
	17:45	Bus to SPUDM reception at the beach
24/8/17 (Thu)	14:00 – 16:00	**Introduction to Python Programming (II)** - Roee Shraga
	16:15 – 17:00	**The Choice Prediction Competition Dataset -** Ori Plonsky
	17:00 – 19:00	**Data Management in Python** - Arik Senderovich
	19:15	Bus to the beach
25/8/17 (Fri)	8:30 – 9:00	Coffee and light breakfast
	9:00 – 10:45, 11:00 – 12:30	**Introduction to Machine Learning with Python (I) -** Arik Senderovich.
	12:30 – 13:30	Light lunch
	13:30 – 14:30	**Implications to Law and enforcement (I)**: Gentle enforcement – Ido Erev
	14:30 – 15:30, 15:45 – 17:00	**Introduction to Machine Learning with Python (II) -** Arik Senderovich.
26/8/17 (Sat)	Afternoon, Evening	Optional social event (TBA)
27/8/17 (Sun)	8:30 – 9:00	Coffee and light breakfast
	9:00 – 10:30	**Introduction to Machine Learning with Python (III)** – Arik Senderovich.
	10:45 – 12:30	**Behavioral Experiments Programming** - Roee Shraga.
	12:30 – 13:30	Lunch

Date	Time	Event
27/8/17 (Sun) – Cont.	13:30 – 14:30	**Keynote talk: Avishai Mandelbaum** - Empirical adventures in Service Systems (Hospitals, Call Centers, Banks, Courts…): From Small Measurements through Big Data to Models and Analytics.
	14:30 – 15:30, 15:45 – 16:30	**Collaborative Filtering and Recommender Systems** - Roee Shraga
	16:30 – 18:30	**Choice Prediction Competitions (I)**, including hands-on work in small groups - Ori Plonsky.
	19:00	Dinner
28/8/17 (Mon)	8:00 – 8:30	Coffee and light breakfast
	8:30 – 9:30	**Implications to law and enforcement (II)**: The example of In-Vehicle Data Recorders - Tomer Toledo
	9:30 – 12:30	**Choice Prediction Competitions (II)**, including hands-on work in small groups - Ori Plonsky