**Descision Support System HW2**

**PART 1**

Each correct answer is 3 points, for a total of 12 points for this part We will be ﬁnishing up our discussion with predictive analaytics in this part. Please read the website and listen to the podcast below :

• O’Reilly Data Show Podcast / Oct. 13, 2017 / Understanding predictive analytics

To answer the questions below you will need to have listened to the podcast in its entirety.

§ **Question 1.1**:

Explain the three tiers or layers of the “layered data architecture” discussed within the ﬁrst 10 minutes in the podcast. What are these three tiers and what are examples from each tier? You may use the table below to ﬁll in your answer:

**ANSWER ;**

**Sources - Hand crafting (feature engineering) and craft a feature that represents the idea**

**Data Massaging – Analyzing patterns that define the data sets. Mega algorithm that extracts features and defines the problem, that extracts and concentrates the semantics**

**Analysis – Scenario analysis required because an algorithm required because an algorithm extracts the features and hand crafting has been eliminated**

§ **Question 1.2:**

There was a discussion of a microserver approach to data analytics and data science. Please explain why such microservers are considered a positive development in analytics (as discussed within the podcast).

**ANSWER;**

**Deals with not only raw data but intuitive insights and applies predictive techniques into an engineering platform**

§ **Question 1.3**:

Explain how personalized marketing is improving predictive recommendation? This answer should not to exceed more than a few words, so don’t overthink what is being asked here.

**ANSWER;**

**Prediction is improved with more data. Marketers collect data and for consumer spending and data management platforms. Predictive recommendation improves with more data**

§ **Question 1.4:**

Give one example of how the ﬁnancial services industry is taking advantage of the advances in machine learning and predictive analytics?

**ANSWER;**

**A business using a feature in their mobile application about predicting recurring payments. This relieves the business of the task of remembering when a payment is due**

**PART 2**

This part is worth 5 points. We talked about decision making under ignorance, where we do not have any deterministic or probabilistic knowledge of the states of nature. Cliﬀ is an investor with a ﬁrm trying to make a decision about what to invest in for the next two quarters. He knows there are 4 economic conditions (states of nature): recession, stable/no growth, moderate growth, and high growth. The payoﬀ table for this is given below:

Economic Condition Stock A Stock B recession 20 -80 stable/no growth 80 10 moderate growth 120 300 high growth 180 500

**§ Question 2.1**

Use the payoﬀ table above: \* Draw the decision tree for the above table. You are encouraged to use silver decisions open source decision tree builder to make your tree.

**ANSWER;**

**See the attached diagram**

**§ Question 2.2**

**\*** What is the expected payoﬀ of the minimax strategy?

**ANSWER;**

**Recommendation: Based on the minimax regret (opportunity loss) approach and the selection of the minimum of the maximum regret values (120), the decision is to invest in Stock A**

§ **Question 2.3:**

\* What is the expected payoﬀ of the maximin strategy?

**ANSWER**

**Recommendation: based on the maximin approach and the selection of ((20), which is the maximum of the minimum payoff the decision is to invest in Stock**

**PART 3**

This part is worth 3 points. Using your knowledge from part 2 we are going to update the scenario with the following information:

• there is a 0.20 probability of a recession quarter • there is a 0.40 probability of a stable/no growth quarter • there is a 0.25 probability of a high growth economy in the next quarter

§ **Question 3.1**

• Update and present your decision tree with the new probabilities.

**ANSWER**

**See the attached diagram**

§ **Question 3.2**

• What is the best strategy now given the probabilities if the investment teamisoptimisticaboutthenext2quarters(recallthestrategythatselects for high risk/high reward under optimism)?

**ANSWER**

**Maxi max decision criterion is choose stock B with a payoff of 125**