BACHELOR OF SCIENCE HONORS DEGREE IN SOFTWARE ENGINEERING

FINAL YEAR RESEARCH PROJECT PROGRESS REPORT

FACULTY OF SCIENCE

UNIVERSITY OF KELANIYA

Bi-Weekly research progress report submitted by the student

Student No: SE/2015/025
Student name: M.S.Prasad
Name of the research project: Cloud Service Selection Using Machine Learning
Name of the research supervisor: DR. LANKESHWARA MUNASINGHE
Report No.: 03
Period covered (from ~ to dates): 2020/11/23 – 2020/12/07

Instructions:

- Bi-weekly report should be completed in every two weeks and must submit to the research supervisor no later than 11:59 pm on the Friday of the second week in review.
- Provide descriptive answers for each of the progress review questions. You may spend 100 ~ 150 words for your answer (it must contain at least 50 words).
- You are strongly advised to contact your supervisor in every two weeks. In your report, you are required to state how you addressed the supervisor's comments for the previous report.

(1) State the overall research progress (from start to UpToDate).

After submitting the second progress report, I can see different issues in my previous model. And I decide to use MCDA method for selecting the Instance family type, but I cannot use this as well. Because we want to use related features that should whether increase or decrease with Instance family. That means this should be ordered categorical feature. So, I cannot use that model, then I can some of relationships for these instance families. So, I use the Multi-Class Classification using SVM for selecting best Instance family for user satisfaction.

Instance Family	Values				
	Processing Power	Memory Usage	Network	Graphical Processing	Storage
1. General Purpose	8	32	6	Low	Low
2. Compute Optimized	16	32	7	Normal	Normal
3. Memory Optimized	4	32	7	Normal	Normal
4. Accelerated Computing	8	32	8	Very High	Normal
5. Storage Optimized	4	32	7	Low	High

Next, we see what are the accuracy rating for prediction model.

Kernel Type Model	Accuracy of Model
Sigmoid Function	0.24
Polynomial Function	0.31
Radial Basis Function (RBF)	0.98
Linear Function	1.0

This is a critical point when entering other models. Because we want to select best perfect Instance family to get correct result. As I expected, I can get best prediction result for this. So, Best model for selecting Virtual Machine Family is **Linear Function SVM** model.
And Next, I created SVM models for selecting Virtual Machines types. As Instance types comprise varying combinations of CPU, memory, storage, and networking capacity and give us the flexibility to choose the appropriate mix of resources.

Instance Type	Values				
	Project Type	Project Size	vCPU	Memory	Network Performance
1. AWS_A1	7	medium	[16-24]	[64-96]	Up to 10
2. AWS_M6g	7	medium	[4-8]	[16-32]	High
3. AWS_M5a	7	medium	[8-12]	[32-64]	Up to 10

Next, we see what the accuracy rating for prediction model are.

Kernel Type Model	Accuracy of Model
Sigmoid Function	0.21
Linear Function	0.92
Polynomial Function	0.96
Radial Basis Function (RBF)	0.97

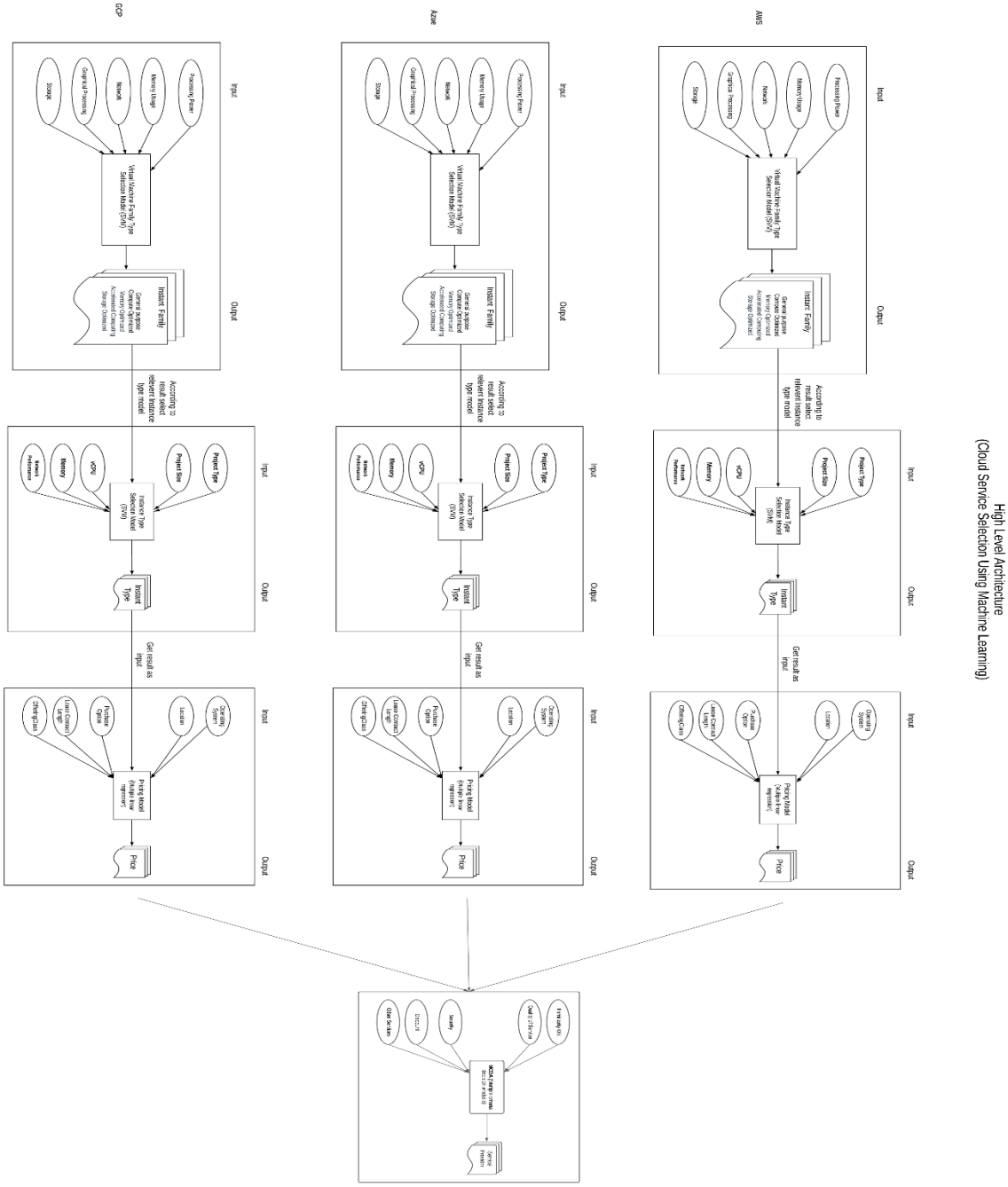
As I expected, I can get best prediction result for this. So, Best model for selecting Virtual Machine Family is Radial Basis Function (RBF) model.

(2) What were the supervisor's comments on the previous report and how did you address them?

According to given result I have to change high-level architecture.

(3) State the progress of your research compared to the previous two weeks period.

Previously, I have issues regarding how to increase accuracy of model, I learned about neural network. So, I followed a course in Coursera and follow lecture of Machine learning in previous week. Then, I could get better idea about neural network. And I follow MCDA method, I can confirm that not suitable for selecting Instance family prediction. So, I train a SVM model in machine learning. So, I have to change high-level architecture as bellow.



(4) What is your plan for next two weeks?

I plan to complete pricing model as well using neural network or other machine learning models. As well as MCDA method for selecting best cloud provider.

(5) Any other matters related to your research.

No problem.