CLOUD ARBITRAGE

ANGELA JIANG, BITANYA KEBEDE, JAELYN CUELLAR, NAJIB AHMED, RAFAEL JAFET, SHANAYA PIRAMAL



How can we help Duke researchers find the best deal for computing resources made available by cloud providers?

PROJECT SUMMARY

- Scraped, processed, and visualized partition availability data from the Duke Compute Cluster (DCC) and spot instance pricing from Azure and AWS
- Formatted this data into an interactive dashboard for researchers' use

MACHINE LEARNING

 Experimented with ARIMA, SARIMA & Holt-Winters models to predict pricing in AWS and availability in the DCC

PROJECT HIGHLIGHTS

- Duke OIT updated its allocation incentives for researchers based on project findings
- Spot Market: Microsoft Azure is significantly cheaper than Amazon Web Services

DUKE COMPUTE

AZURE

Desir	ed N	Number of CPU	core(s) 32.0	Desired RAM	1 (GB) 128.0	✓ Desired	Ev
			10 Cheapest	SKUS Globally			
		SKU	Unit Price (USD/Hr)		effectiveStartDate		ΚU
		Standard_D32ads_v	0.1952	US West	2022-11-01	St	and
		Standard_D32_v3	0.2016	US Gov AZ	2023-07-01	St	and
		Standard_D32d_v4		KR South	2023-06-01	St	and
		Standard_D32ds_v5	0.217868	US West Central	2023-05-01	St	and
		Standard_D32ads_v	0.227344	AU East	2023-07-01	St	and
		Standard_D32ads_v	0.2288	SE South	2023-05-01		
		Standard_D32s_v5	0.289539	EU North	2023-04-01		
		Standard_D32_v3	0.374262	US Gov AZ	2023-07-01		
		Standard_D32d_v4	0.390313	KR South	2023-07-01		
		Standard_D32ads_v	0.442928	SE South	2023-07-01		
			Price vs His	torical Time			
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	0.2			:			Ш
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		Nov 2022 3a	n 2023 Mar 2		23 Jul 2023	0.2	

AWS

Α	AWS 10 Cheapest Prices												
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10	10 cheapest prices worldwide and within the US.												
		Desired n	umber of CPU cor	e(s):									
	Desired RAM (GB): 16.0												
Г	Submit												
Γ													
ľ	Table 1: 10 Cheapest Worldwide Table 2: 5 Cheapest in US												
ĺ		InstanceType	AvailabilityZone	Spot	Price		Instan	сеТуре	AvailabilityZone	SpotPrice			
	1	a1.2xlarge	ap-south-1c	0.139	700	1	a1.2xlaı	rge	us-east-2b	0.149678			
	2	a1.2xlarge	ap-south-1b	0.140	292	2	a1.2xlar	rge	us-east-2a	0.172824			
	3	a1.2xlarge	us-east-2b	0.149	9678	3	c6gd.2	xlarge	us-east-2a	0.192708			
	4	a1.2xlarge	ap-northeast-1d	0.154	1030	4	c6gd.2	xlarge	us-east-2c	0.193236			
	5	a1.2xlarge	ap-northeast-1a	0.155738		5	c6gd.2	xlarge	us-east-2b	0.195060			
	6	a1.2xlarge	us-east-2a	0.172	824								
	7	c6g.2xlarge	ap-southeast-4c	outheast-4c 0.192									
	8 c6g.2xlarge		ap-southeast-4b	0.192	2100								
	9 c6g.2xlarge		ap-south-2c	p-south-2c 0.192									
ŀ	10	c6g.2xlarge ap-south-2b		0.192100									
L	Look at the historic AWS Price												
	Cores: — 8												
	RAM (GB): 32												
1	27 AvailabilityZone InstanceType ProductDescription SpotPrice \												
Ŀ	31 an-east-1b m5.2xlarge Red Hat Enterprise Linux 0.268700												



Project Sponsor: Charley Kneifel
Code+ Directors: Isabel Valls & Jen Vizas

Project Leads: Mark McCahill & Drew Stinnett

Duke OIT: Katie Kilroy, Tom Milledge, and Mike Newton