In [1]:	Job Recommendation Using Knowledge Graph  import networkx as nx import pandas as pd from pyvis.network import Network from operator import itemgetter import matplotlib.pyplot as plt from IPython.display import display
	<pre>from IPython.display import display import collections  resume_counts=40 jd_count=40  nxversion '2.6.3'  job_description_dataset = pd.read_json(</pre>
<pre>In [4]: Out[4]:</pre>	"Dataset\dataset_job_description.json")  job_description_dataset.head(n=5)  salary domain education crawled_at description title skills country  1. 10.00_26.00 / hour https://www.careerbuilder.com/ bare bare bare bare bare bare bare bare
	1 19.00—26.00 / hour https://www.careerbuilder.com/ begree 2021-05-05 Degree 203:01:50
In [5]:	
Out[5]:	resumes  0 {'id': 1, 'careerjunction_za_historical_jobtit  1 {'id': 2, 'careerjunction_za_historical_jobtit  2 {'id': 3, 'careerjunction_za_historical_jobtit  3 {'id': 4, 'careerjunction_za_historical_jobtit  4 {'id': 5, 'careerjunction_za_historical_jobtit
In [6]:	<pre>jd_total_count=len(job_description_dataset) resume_total_count = len(resume_dataset)  print(f"Total Job Descriptions {jd_total_count}") print(f"Total Resumes {resume_total_count}")  #! uncomment to load entire dataset # resume_counts = resume_total_count # jd_count = jd_total_count</pre>
In [7]: In [8]:	Total Job Descriptions 10501 Total Resumes 2000  for resumeData in resume dataset.values[:1]: # first two resumes     print(resumeData[0]['id']) #id     print(resumeData[0]['careerjunction_za_skills']) # skills     print(resumeData[0]['careerjunction_za_courses']) # Degree     print(f" Experience { len(resumeData[0]['careerjunction_za_historical_jobtitles'])}") # Experience  1 ['Emergency Handling', 'Microbiology', 'microsoft powerpoint', 'microsoft office', 'microsoft excel', 'microsoft project management', 'Microsoft word', 'Outlook', 'BootStrap', 'Internet explorer', 'Marke ting/Sales', 'Quality Control', 'Quality Assurance', 'Research and development', 'Problem solving'] ['Btech: Food Technology', 'National Diploma: Food Technology', 'Senior Certificate'] Experience 5  for jobData in job_description_dataset[:1].values: # first two job description     print(jobData[0]) # Salary     print(jobData[0]) # Salary     print(jobData[0]) # Skills     print(jobData[0]) # Degree
In [9]:	<pre>numbers = [int(word) for word in jobData[14].split() if word.isdigit()] numbers.append(0) experience = max(numbers) print(experience) # Experience print(jobData[20]) # Job Type  2b387592-8148-5720-a661-a2730061d14c 517.23 - \$22.00 / hour Microsoft Office , java ee , cics , Adobe Photoshop , asp , Adobe After Effects , Powerhouse Programm ing- beginners and advance , asp .NET Bachelor's Degree 2 FULL_TIME  nodes = [n for n in resume_dataset.values][:resume_counts] # TODO: Change count to desired no of resume s nodes_id=[n[0]['id'] for n in nodes] # nodes_id edges = [tuple(e) for e in job_description_dataset.values] # edges</pre> Extract Job Id, Skills and experience from job post
In [10]:	<pre>G = nx.Graph()  jobid = [] req_skills = [] req_experience = []  counter = 0  for job in job_description_dataset[:jd_count].values: # TODO: Change count to desired no of JD     _skills = job[6].split(",")     jobid.append(job[17])</pre>
	<pre>req_skills.append(_skills) numbers = [int(word) for word in job[14].split() if word.isdigit()] numbers.append(0) experience = max(numbers) req_experience.append(experience) counter += 1 if(counter == jd_count): # TODO: Change count to desired no of JD break print(len(jobid))</pre>
In [11]:	Extract resume Id, Skills and experience from Resume  resumeId = [] resumeSkills = [] resumeExperience = [] # Side note: use a for loop instead of individual loops resumes = [n for n in resume_dataset.values][:resume_counts] # TODO: Change count to desired no of resu
Out[11]:	<pre>mes resumeId = [n[0]['id'] for n in resumes] resumeSkills = [n[0]['careerjunction_za_skills'] for n in resumes] resumeExperience = [    len(n[0]['careerjunction_za_historical_jobtitles']) for n in resumes] resumeExperience</pre>
	0, 0, 7, 2, 1, 0, 4, 4, 0, 0, 0, 0, 0, 0,
	0, 0, 4, 4, 6, 0, 0, 10, 4, 1, 0,
	4, 2, 2, 5, 4, 8, 2, 0, 6, 0, 2,
In [12]: In [13]:	<pre>0, 0]  edge_data = zip(jobid, req_skills, req_experience) node_data = zip(resumeId, resumeSkills, resumeExperience)  Adding Job Description and skill node, are connected with an edge having weight of experience  for j, e in enumerate(edge_data):</pre>
	<pre>src = e[0] dst = e[1] w = e[2] # print(dst) G.add_node(src, color='#dd4b39', title=src,type='jobDescription') for eachSkill in dst:     eachSkill=eachSkill.strip()     G.add_node(eachSkill, title=dst, type='skill', experience=w)     # if str(w).isdigit():     if w is None:         G.add_edge(src, eachSkill, value=w, color='#00ffle', label=w)     if 1 &lt; w &lt;= 70000:         G.add_edge(src, eachSkill, value=w, color='#FFFF00', label=w)     if w &gt; 70000:         G.add_edge(src, eachSkill, value=w, color='#dd4b39', label=w)  else:         G.add_edge(src, eachSkill)</pre> Adding resume and skill node, are connected with an edge
In [15]:	<pre>for j, e in enumerate(node_data):     src = "ResumeId-" + str(e[0])     dst = e[1]     w = e[2]     G.add_node(src, color='#dd4b39', type='resume', title=src)     for eachSkill in dst:         eachSkill = eachSkill.strip()         G.add_node(eachSkill, title=eachSkill, type='skill', experience=w)         G.add_edge(src, eachSkill, color='#00ff1e')  nt = Network('1080px', '1960px', notebook=False)     # populates the nodes and edges data structures # nt.from_nx(G) # nt.show('nx.html')  Analysis of Network  nx.info(G)  'Graph with 754 nodes and 933 edges'</pre>
Out[15]: In [16]:	'Graph with 754 nodes and 933 edges'  Find Skills ,Job Description , Resume having highest degree. (which means highest connections)  • Most influential among them all  • Who is the most influetial?  • nx.degree_centrality(g)  degree_dict = nx.degree_centrality(G) nx.set_node_attributes(G, degree_dict, 'degree')
	<pre>sorted_degree= sorted(degree_dict.items(), key=itemgetter(1), reverse=True)  def popularNodeByType(type):     for d in sorted_degree:         if(G.nodes[d[0]]['type'] == type):</pre>
In [17]:	Popular Description: ('e5a255c2-3dce-5582-823b-a6a195b50041', 0.054448871181938904)  pop_skill_g = nx.bfs_tree(G, popular_skill[0], depth_limit=1)  nx.draw_networkx(pop_skill_g)  Resumeld-13  Resumeld-14  Resumeld-14  Resumeld-14  Resumeld-14
	Resume Id-17  esume Id-38  Resume Id-21  Resume Id-30  Resume Id-27  Resume Id-27  Resume Id-27  Resume Id-27  Resume Id-27  Resume Id-27  Resume Id-2
In [18]:	pop_resume_g = nx.bfs_tree(G, popular_resume[0], depth_limit=1)  nx.draw_networkx(pop_resume_g)  Asp Microsoft Asta Basin to 2 Through Net)  rchitecture paster Francework Systems an agretient quity.Insurance Pension Provident Management  Business Analysis  Assemble Basic For Applications cus_Dialogue Systems  Oracle Pro/Cot Systems Anal
In [19]:	pop_jd_g = nx.bfs_tree(G, popular_jd[0], depth_limit=1) nx.draw_networkx(pop_jd_g)  Network Managan and Communications  Network Managan and Communications
	Reviewed LAN  Jange Management  Jange Management
In [21]:	<pre>D=nx.average_neighbor_degree(G) sorted_x = sorted(     D.items(), key=itemgetter(1), reverse=True) D=collections.OrderedDict(sorted_x)  plt.bar(range(len(D)), list(D.values()), align='center') plt.xticks([])  ([], [])</pre>
	40 - 35 - 30 - 25 - 20 - 15 - 10 - 5 -
	Eigen vector centrality take an account of nodes, edges as well as connections of that nodes  • Eigenvector Centrality  • Most important connection  • Do you know whom I am related to?  • eg Google Page Rank
In [22]:	<pre>betweenness_dict = nx.betweenness_centrality(G, weight=True) # Run betweenness centrality eigenvector_dict = nx.eigenvector_centrality(G, max_iter=600, weight=True) # Run eigenvector centrality  # Assign each to an attribute in your network nx.set_node_attributes(G, betweenness_dict, 'betweenness') nx.set_node_attributes(G, eigenvector_dict, 'eigenvector')  sorted_betweenness = sorted(     eigenvector_dict.items(), key=itemgetter(0), reverse=True)  print("Top 20 nodes by eigenvector centrality:")</pre>
	<pre>count=0; for b in sorted_betweenness:     if(G.nodes[b[0]]['type']=='resume'):         print(b)         count+=1     if count==20:         break  Top 20 nodes by eigenvector centrality: ('ResumeId-9', 0.008072713991565185) ('ResumeId-8', 0.027816125602549552)</pre>
	('ResumeId-7', 0.09842699031131112) ('ResumeId-6', 0.0411170784265453) ('ResumeId-5', 0.013366115874459234) ('ResumeId-40', 0.04462645454419095) ('ResumeId-4', 0.003611778618268414) ('ResumeId-39', 0.01265961960542648) ('ResumeId-38', 0.09506953917661637) ('ResumeId-37', 1.0065187625831446e-50) ('ResumeId-36', 0.017198613147092593) ('ResumeId-35', 0.03214532214785574) ('ResumeId-34', 0.07177595108756023) ('ResumeId-33', 0.05227056211357188)
	('ResumeId-32', 0.02055623565464414) ('ResumeId-31', 9.088971439450628e-46) ('ResumeId-30', 0.055722118986820245) ('ResumeId-3', 0.016697877204718013) ('ResumeId-29', 0.03208278297329713) ('ResumeId-28', 0.020432939018650807)  Input: skill Output: recommend (description, resumes)

Snpp Purchasing ASP.Net MVC jQuery Nuance Product Salesforce.Com methodical BootStrap Spring Framework codeigniter Powerhouse Programming- beginners and advance 6e18743d-a5af-5dc1-a6b1-20d293705199 Customer Service Network + Asp.Net 4.5 Mvc Sales Operations Positive Attitude Scripting Computer Literacy Technical Support Develop Relationship Building Interpersonal As/400 Os Apache Struts Microsoft Sql Server T-Sql windows forms Borland C++ Microsoft Visual C++ 61c088f9-63ea-5a47-b0ab-9310db497b4d Coaching And Mentoring Oracle Sql Reports Driving Outlook Plumbing Microsoft Solutions Framework Sql Television Commissioning Microsoft Visio Documentation Angular Data Visualization BIZTALK oracle Test Management Operating Systems REST Services Pharmaceutical Food Services ResumeId-35 Interpersonal Skills MicroStation 53975ae6-ae18-5dd5-8f64-a4e378a7b9b9 ResumeId-40 PostgreSQL ResumeId-8 It Operations Management Chairing Meetings Written Communication Oracle Pro/Cobol analytics bootstrap and jquery AutoCAD Analytical Communication Skills Distributors dae41437-da2b-5d60-942b-a6903029bfb4 Account Management Linux Adabas C For Windows java ee SVN Configuration Management Adobe After Effects software engineering Microfocus Dialogue Systems Css 3 Disaster Recovery Planning python sqlserver Local Area Networks Sound Systems Conditioners (Farming) Visual Basic (Ver 2 Through .Net) Ethernet Manager Account management Adabas android programming Networking/Lans Smaller systems that had to be developed as well includes the housing system ResumeId-14 Taxation, Financial, Equity, Insurance, Pension/Provident Sys ajax networking Documenting Requirements java Computer Sciences strategic Troubleshooting (Problem Solving) Advertising Business Analytics Vbscript Team Lead Metrics java and C#. HP SOA SYSTINET ResumeId-30 JAVASCRIPT Dishwashers Xml (Dtd'S, Schema'S) XMLTime Management ASP Product Owner Microsoft Frontpage Veterinary Technical Training Visual Studio 2008,20010,2012 Architectures - Legacy Mainframe Etc EntityFrameWork 6 DB2 T-SQL Processes & Projectmanagement Visual Basic 6 And Other Versions Administration Git • Presenting. Microsoft word data science Project Planning 1ba7e60b-ceb0-5872-b79b-43c1f0dac39e Information risk management 1bf29273-d09c-573e-b230-c6adbd9a8821 Project Management Communications Garbage Disposal Unit Java Development ResumeId-21 Maintenance Business Analysis (Requrement Developing Functional Specifications Documents) Facilitating Operations 3da9b977-9603-542d-9466-cd52e51c3bd8 Macromedia Fireworks Mx Unit Testing Adobe fireworks Installations (Manual/Mechanical) ResumeId-34 Development (Overall) Research and development Access 16c9ff4b-1e24-5a37-ac1f-202991986e30 Managerial Bloomberg test and support solutions built using SharePoint Troubleshooting Ranorex database design and managment Telephonic Skills and leader ship skills ResumeId-17 Microbiology Business To Business Sales and Marketing Computer-Aided Design d48dd701-fbf4-5a3c-b4b1-412928be24b6 ResumeId-20 Clinic Management Sentry Microsoft Sql Server Oracle  $\square$ Windows 7 Voice Biometrics Project management ResumeId-13 Report Creation and Distibution Rapid Prototyping analytical R solutions architect English vaadin Nuance Voice Products Database Administration Internet Procurement Multitasking reporting Gerrit MySQL C++ Developer budget allocation Spanish Language Creativity Network Connections Team Building Training Service-Oriented Architecture Javascript angular 1 ResumeId-2 Retailing Landscaping Construction Natural ResumeId-27 Teamcity Pl/Sql d6dd4a06-0afb-5a15-8fb7-85c2b8c54ea4 Intrusion Detection And Prevention Communication Firewall Call Center Sql Server 2005 e7fc9e40-ac86-5cf2-ba8f-3c1ef9e21982 Research Experience (Completed Research Phd) Computer Skills (Hardware, Software, Networking) Windows 2008 server C# .Net SAP FICO Assembler Asp Web Development Fault XSL Microsoft Microsoft Software Packages Wide Area Networks architecture Trustworthy Sales Windows Services a69e6c10-48e5-5c91-938e-1f09bba95729 ResumeId-16 Surveys ASP.NET Presentations Social Media Silk Central Six Sigma Methodology Key Account Management ResumeId-9 ResumeId-26 HTMLJruby RDBMS Voice Verilog Oracle Frontend developer See attached CV UML Java Java Programming a63bdbd3-3eae-5052-8927-fcf83c361cb0 Archi Iis 4/5 Jenkins Hardworking And Dedicated quick learner English Language Data SharePoint Skills Scheduling Basic Android programming Service-Orientation Resource Planning Angular JS Checklists css3 SQL Databse Development JAVA Objective C C# Android and windows phone 7 app development. Success Driven Systems Analysis Network Security Infrastructure Online Research CSS3 LESS Matlab Counsellor Business Process Improvement New Business Development sas Selling Techniques Microsoft Access hibernate 2b387592-8148-5720-a661-a2730061d14c Linux (fedora/ubuntu) 0d4d608a-17c0-5e6b-827e-88ad505cad09 Windows 10 ResumeId-24 Empathy with their client Mysql Programming Sharepoint Hr Auditing Problem sloving Computer networking Continuous Integration blogger 64202ed2-90a7-5139-90e9-4c3caa409aba Power point and MS Excell jsp Gaming Ibm Db2 Microsoft Biztalk Server Meeting deadlines Customer Relationship Management .NET Problem Solving Computer Skills Coordinating Pro C Microsoft Office ResumeId-19 Unique Python HA Proxy Hibernate (Java) Visual Basic For Applications (Office Automation) Systems Analysts 3245816c-1ae2-53db-9e31-ee6dfa591981 jason ASP.Net Bootstrap • Dashboard Agile Software Development Networks Lean Manufacturing Human Resource And Payroll Systems Network Management Delegate Tasks And Supervise Results Data Cabling CSS Oracle Developer 2000 Sql Windows C# MVC Revision Controls Windows 2000 Server Admin And Windows Nt Debugging Distributed Computing Relays French Languages PHP Backup Wireless Communications Dhtml Dryers Electronics 1 & 2 Xhtml Detailed Asp.Net Mvc Customer servece Entity Framework Governance 5e7cf91c-9ae9-58de-9aa8-e84e7c3e4d03 AJAX SQL Telerik Controls 66fc13b0-6871-5598-a9a3-4fb9b6e7aa04 ResumeId-22 Agile Methodologies dc29c791-448a-5532-9100-a1f5c9a741c0 Accounting Up To Balance Sheet Adobe Photoshop Network Support Sales Support Team-working Asp.Net Webforms html 0242a07f-aae1-56cf-a264-53eb2b402d89 Furnishing Wireless LAN Simulink Designs Presentation Skills Systems Design Authorization (Computing) Database Desing SSRS MS word microsoft powerpoint Motivational Skills Testing jquery and css Relationship Management Packaging And Labeling Psychology Degree 2a66bd9b-d67c-5c7a-b9ff-2eac73dfdbdb Macromedia Flash Washing Machines Program Management MS SQL tsql MS SQL Server ResumeId-28 microsoft project management A dedication to customer service mySQL Windows Workstation, Servers ssis Voice Specialist AngularJS Excel Java Programming (SE & EE) cics Perl IVR Verbal Communication Active Server Pages javascript C + + Ideal/Datacom Cobol Ajax Scrum Master SOAP MVC (2 Year) • Information Security Continuous Improvement Process Internet explorer IATA messaging and SSIM formats Practice Management 38646b26-5108-53f7-8375-130d2ed752cd Javascript and bootstrap asp .NET Web Services Negotiation and Java ResumeId-4 Manuals Html 5 Programming (Java; C++; Vb) Vb.Net Learning Spring Technical Information AWS C++Microsoft Office 97 Xml Web Services Microsoft excel Microsoft Excel Management asp IIS Computer Hardware ResumeId-6 Oracle 7/8/9/10g/11g Web Development RADIUS 2 and 4 Complex Problem Solving Reliability Implementation And Management Embedded Linux Engineering ionic framework Business Acquisition ColdFusion Soap development 3g/Hspa/Hspa+ Leadership Stress Management Business Process Quality Control Supply chain Management solutions Oracle Pl/Sql SharePoint ResumeId-33 Community engagement MongoDB Facilitation Of Workshops And Trainings Solution/ Requirements Definition Architectures - Ntier, Client Server Etc Python (Programming Language) android database maintenance Microsoft Word C / C++ Network connectivity, FTP, TCP SOA C Programming Language Attention To Detail ResumeId-32 Microsoft Windows 2000 Emergency Handling Database Desing, Implementation And Management Branding client liasion VBA java programming JQuery GIT Test Planning HTML5 In-depth knowledge of the market Systems Development Life Cycle WCF Java Developer ResumeId-29 proficient in Linux systems such as Ubuntu and Fedora Analitcal skills MYSQL 8b6b33e1-8dfc-5274-b3e6-cda37f549fdc Passionate Java SE a2ea21ac-ed28-552b-a9d3-c805f83bbe58 Business Consulting Java EE (restful API's) ResumeId-38 Software Development Electronics Development billing system Change Management Research C# Developer 4g/Lte/Wimax Microsoft Sna/Host Integration Server Qlikview Social Skills ResumeId-15 SQL/MySQL Geographic Information Systems 56594db3-73b9-5525-9368-de17962fb75d Networking Hardware Informatica jcl Cics Git wordpress Systems Integration Avaya Health Insurance MVC5 ResumeId-39 Content Management Server 2002 mysql Database Design Prototype (Manufacturing) excel Budgets Enhanced Data Rates For GSM Evolution Voice Loggers Logo Design firebase vertical PowerPoint and outlook. Programming lalanguages:vb .NET Perl (Programming Language) Analytical Skills SAP BI Crystal and Web Intelligence ResumeId-1 Tooling asp .NET winforms Analytical Thinking Skills ResumeId-25 Switch (Electrical Components) Com Cobit 5 Certificartion Microsoft office advanced word Databases Microfocus Cobol contact with internal and external parties SQL database design and development Campaigns JIRA Photoshop IT electronic :assembler language and networks Magento Consulting Management Information Systems architect leadership Software Design Marketing Designer SSIS Incident Management Visual paradigm Dispatching Avaya PABX Wcf Services Sql Server Reporting Services af546f56-f750-5254-b9f1-8758abe95359 ResumeId-7 ResumeId-36 Analysis ResumeId-3 analysis Unix (Sun Solaris) Fico Blaze Electrical Wirings Mentoring caa34d99-8aa4-5ade-8ada-7d41a77acf6e JavaScript communication skills Oracle Designer 2000 Architectures - .Net Framework Graphic Design microsoft office Application Services Asp.Net VB Life Skill Oracle Rdbms Specialist Java EE (restful APIS) TCP/IP MS PROJECTS Hyperion Analyzer Java ME Market Trend Self Motivation Sql Server Integration Services J Developer Web developer e5a255c2-3dce-5582-823b-a6a195b50041 Network Switches delphi Microsoft Windows 98 Dec Vax Openvms Simple Object Access Protocol (SOAP) Marketing/Sales Java (Programming Language) Amazon Web Services forensics Gradle  $\square$ f1b26fb3-4bf0-58c3-a34c-78af2d118070 MFC Geometry Mfc Microsoft office O/S Symbian Uiq Forecasting Talend Crystal Report Writer 5, 8.5 NICE Automation Painting ASP .NET  $\square$ Mentoring new developers Life Insurance Sql Server knowledge of word ResumeId-5 Public Relations Unix JAVA Developer Manufacturing CUSTOMER SERVICE Dietician Problem solving Process Design Product Engineering programming ITIL Business Analysis Product Quality Assurance Benchmarking (Project Management) microsoft excel Higher Diploma in Education SQL (Programming Language) 4bcf6006-70b9-5bce-8f51-320156b24eb0 C++ Builder ΒI Curiosity affdc27f-a106-528e-98e2-e8136d7e59b0 Motors Networking AWS RDS CSS Open Office Long-term relationship-building skills ResumeId-18 Quality Assurance Corel Word Perfect And Quattro Pro ResumeId-12 2fea03fb-e855-596f-915c-f2feb28da9fb Bash Senior Developer Ability To Work In A Team Analytics Prince2 Project Management Friendliness In [24]: nx.draw spring(G) **Predicting Associations**  Clusting Coefficient nx.clustering(Graph, Node) • nx.average\_clustering(g) In [25]: nx.average clustering(G) Out[25]: 0.0 **Recommend Users to learn skills** [Bipertite graph concept applies here] In [26]: resume1\_nbrs=G.neighbors('ResumeId-2') resume3 nbrs=G.neighbors('ResumeId-3') differentSkills= set(resume1\_nbrs).difference(resume3\_nbrs) skillNodes=[] for skill in differentSkills: skillNodes.append(G.nodes[skill]) sortedSkillsAccrToEigen = sorted(skillNodes, key=lambda i: i['eigenvector'], reverse=True) print("Top Skills to be learned") for skill in sortedSkillsAccrToEigen: print(f"{skill['title']} {round(skill['eigenvector'],3)}") Top Skills to be learned C# 0.133 SSIS 0.034 SSRS 0.019 EntityFrameWork 6 0.008 Emergency Handling 0.004 BootStrap 0.004 MVC5 0.004 JQuery 0.004 SQL Databse Development 0.004 REST Services 0.004 In [27]: | hh = list(G.neighbors('C#')) len(hh) Out[27]: 15 input: Resume output: List of recommended Job Descriptions In [28]: def get\_all\_adj\_job\_description\_nodes(resume3\_nbrs): related job description nodes dict = {} for skill in resume3 nbrs: skill nabhour = G.neighbors(skill) for each node in skill nabhour: if (G.nodes[each node]['type'] == 'jobDescription'): if G.nodes[each\_node]['title'] in related\_job description nodes dict: related\_job\_description\_nodes\_dict[G.nodes[each\_node] ['title']] += 1 else: related\_job\_description\_nodes\_dict[G.nodes[each\_node] ['title']] = 1 return related job description nodes dict resume3 nbrs = G.neighbors('ResumeId-20') jobDescriptionNodes = get\_all\_adj\_job\_description\_nodes(resume3\_nbrs) sortedJobDescriAccToConNodes = dict(sorted( jobDescriptionNodes.items(), key=lambda i: i[1], reverse=True)) print("Recomended Job Descriptions") for job in sortedJobDescriAccToConNodes: print(f"{job} {sortedJobDescriAccToConNodes[job]}") Recomended Job Descriptions e5a255c2-3dce-5582-823b-a6a195b50041 3 2b387592-8148-5720-a661-a2730061d14c 1 2fea03fb-e855-596f-915c-f2feb28da9fb 1 d6dd4a06-0afb-5a15-8fb7-85c2b8c54ea4 1 e7fc9e40-ac86-5cf2-ba8f-3c1ef9e21982 1 3245816c-1ae2-53db-9e31-ee6dfa591981 1 0242a07f-aae1-56cf-a264-53eb2b402d89 1 1bf29273-d09c-573e-b230-c6adbd9a8821 1 61c088f9-63ea-5a47-b0ab-9310db497b4d 1

In [23]: allConnectedNodes=nx.node\_connected\_component(G, 'BootStrap')

for node in allConnectedNodes:

print(node)