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# Pregled i analiza podataka o oglasima za posao

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# Opis skupa podataka

↪ <https://www.kaggle.com/datasets/andresionek/data-jobs-listings-glassdoor>

↪ Skup podataka o svim aktivnim oglasima za posao u jednom danu na globalnom sajtu za pronalaženje poslova Glassdoor. Sastoji se od 15 csv fajlova koji ukupno imaju 265 kolona i zauzimaju 1.6GB memorije.

# Agregacije

1. 10 gradova sa najviše oglasa za posao u Francuskoj
2. Prosečna plata u zavisnosti od velicine firme u Velikoj Britaniji
3. 5 Najplacenijih poslova u Velikoj Britaniji
4. Najbolje prosečno ocenjene kompanije sa bar 50 ocena zaposlenih
5. Plate programera i seniora u Velikoj Britaniji i Njemacka
6. Koja je prosečna ocena benefita u Londonu koji u svojim uslugama imaju benefit "rad od kuće"?
7. Koja je najcesce rangirana industrija u Londonu?
8. Koji je najcesci emp u Srbiji koji je ocenjen bar jednom, a radi za posao Softverskog inzinjera ili front end developera?
9. Izlistaj koji poslovi imaju benefit sportskih usluga, kao i koliko ih ima?
10. Koji su top 5 industrija u kojima Softverski inzinjeri zaradjuju navise para?

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# Inicijalna logicka sema

Sastoji se od 4 csv fajla spojeni u jednu kolekciju

Za kreiranje i popunjavanje kolekcija korištene Python skripte, upotrebom PyMongo i csv paketa

# Inicijalna logicka sema

Key	Value	Type
> (7) {_id : 0000016e56d0b5c1ae9faad8d730a05c}	{ 12 fields }	Document
> (8) {_id : 0000016e56d0b8bd9723afa8a8463e86}	{ 13 fields }	Document
> (9) {_id : 0000016e56d0b8f2906e0190a37a4e65}	{ 13 fields }	Document
> (10) {_id : 0000016e56d0b96392202798c868f4be}	{ 12 fields }	Document
▼ (11) {_id : 0000016e56d0b93bac2678ecd4fd82b0}	{ 15 fields }	Document
_id	0000016e56d0b93bac2678ecd4fd82b0	String
empld	2482936	Int32
empName	HSBC Global Technology (HSBC GLT)	String
empSize	-1-0	String
industryId	200048	Int32
industry	Banks & Credit Unions	String
jobId	3388450352	String
jobTitle	Digital Product Manager, Digital Customer Onboarding - Retail Banking and Wealth Management	String
location		String
country	HK	String
benefitRating	4.0	Double
nubmerOfRatings	1	Int32
benefits	[ 1 elements ]	Array
reviews	[ 1 elements ]	Array
salaries	[ 5 elements ]	Array
> (12) {_id : 0000016e56d0b91c94a12db296d1fe29}	{ 13 fields }	Document
> (13) {_id : 0000016e56d0b86d98d6968991dcb96d}	{ 12 fields }	Document
> (14) {_id : 0000016e56d0b9bea98208eaf4884505}	{ 15 fields }	Document

# Inicijalna logicka sema

123	numberOfReviews		
▼	benefits	[ 1 elements ]	Array
▼	0	{ 6 fields }	Object
	currentJob	false	String
	rating	4.0	Double
	jobTitle		String
	state	England	String
	city	Birmingham	String
	comment	Good Pension, holidays, yearly bonus, flexible working hours, Perks vouchers, you can have community days etc....	String
▼	reviews	[ 1 elements ]	Array
▼	0	{ 8 fields }	Object
	_id	28285413	String
	overallRating	3.0	Double
	compBenefitsRating	5.0	Double
	cultureValuesRating	3.0	Double
	seniorManagmentRating	2.0	Double
	workLifeBalanceRating	3.0	Double
	jobTitle	Development Officer	String
	currentJob	Former Employee: I worked at HSBC Global Technology (HSBC GLT) full-time for more than a year	String
▼	salaries	[ 5 elements ]	Array
>	0	{ 4 fields }	Object
▼	1	{ 4 fields }	Object
	jobTitle	Business Analyst	String
	payCount	1	String
	payPercentile10	31711.792408057277	Double
	payPercentile90	34392.2724544732	Double
>	2	{ 4 fields }	Object
>	3	{ 4 fields }	Object
>	4	{ 4 fields }	Object
>	(12) { _id : 0000016e56d0b91c94a12db296d1fe29 }	{ 13 fields }	Document

# Skripta za popunjavanje sema


```
def add_jobs_to_db(self, url, db_name):
    client = pymongo.MongoClient(url)
    db = client[db_name]
    db['glassdoor'].delete_many({})
    jobs = []
    with open(self._file, 'r', encoding = 'cp850') as csv_file:
        reader = csv.DictReader(csv_file)
        for row in reader:
            job = self.get_job(row)
            try:
                job['benefits'] = self.benefits[row['benefits.comments']]
            except:
                pass
            try:
                job['reviews'] = self.reviews[row['reviews']]
            except:
                pass
            try:
                job['salaries'] = self.salaries[row['salary.salaries']]
            except:
                pass
            jobs.append(job)

    db['glassdoor'].insert_many(jobs)
```

```
def get_job(self, row) -> dict:
    return {
        '_id': row['gaTrackerData.pageRequestGuid.guid'],
        'empId': int(row['gaTrackerData.empId']),
        'empName': row['gaTrackerData.empName'],
        'empSize': row['gaTrackerData.empSize'],
        'industryId': int(row['gaTrackerData.industryId']),
        'industry': row['gaTrackerData.industry'],
        'jobId': row['gaTrackerData.jobId.long'],
        'jobTitle': row['gaTrackerData.jobTitle'],
        'location': row['gaTrackerData.location'],
        'country': row['map.country'],
        'benefitRating': float(row['benefits.benefitRatingDecimal']),
        'nubmerOfRatings': int(row['benefits.numRatings']),
    }
```

# Primjeri agregacija

1. 10 gradova sa najviše oglasa za posao u Francuskoj - vreme izvršavanja


 00:00:00.199

```
//1. 10 gradova sa najviše oglasa za posao u Francuskoj
db.getCollection("glassdoor").aggregate([
  { $match: { $and: [{ country: "France", location: { $ne: "" } } ] } },
  { $group: { _id: "$location", jobListingCount: { $sum: 1 } } },
  { $sort: { jobListingCount: -1 } },
  { $limit: 10 },
]);
```



# Primjeri agregacija

2. Prosečna plata u zavisnosti od velicine firme u Velikoj Britaniji – vreme izvršavanja:

 00:00:00.209

```
//2. Prosečna plata u zavisnosti od velicine firme u Velikoj Britaniji
db.getCollection("glassdoor").aggregate([
  { $unwind: "$salaries" },
  { $match: { country: "United Kingdom" } },
  {
    $group: {
      _id: "$empSize",
      payPercentile90: { $avg: "$salaries.payPercentile90" },
    },
  },
  { $sort: { payPercentile90: -1 } },
]);
```

# Primjeri agregacija


3. 5 Najplacenijih poslova u Velikoj Britaniji – vreme izvršavanja:

00:00:00.213

```
//3. 5 Najplacenijih poslova u Velikoj Britaniji
db.getCollection("glassdoor").aggregate([
  { $unwind: "$salaries" },
  { $match: { country: "United Kingdom" } },
  {
    $group: {
      _id: { country: "$country", jobTitle: "$salaries.jobTitle" },
      maxPayPercentile90: { $max: "$salaries.payPercentile90" },
    },
  },
  { $sort: { maxPayPercentile90: -1 } },
  { $limit: 5 },
  {
    $project: {
      _id: 0,
      jobTitle: "$_id.jobTitle",
      maxPayPercentile90: 1,
    },
  },
]);
```

# Primjeri agregacija

4. Najbolje prosečno ocenjene kompanije sa bar 50 ocena zaposlenih – vreme izvršavanja:

 00:00:00.995

```
//4. Najbolje prosečno ocenjene kompanije sa bar 50 ocena zaposlenih
db.getCollection("glassdoor").aggregate([
  { $unwind: "$reviews" },
  {
    $group: {
      _id: "$empName",
      rating: { $avg: "$reviews.overallRating" },
      numOfRating: { $sum: 1 },
    },
  },
  { $match: { numOfRating: { $gt: 50 } } },
  { $sort: { rating: -1, numOfRating: -1 } },
]);
```

# Primjeri agregacija

5. Plate programera i seniora u Velikoj Britaniji i Njemacka – vreme izvršavanja:


00:00:00.220

```
//5. Plate programera i seniora u Velikoj Britaniji i Njemacka
db.getCollection("glassdoor").aggregate([
  { $unwind: "$salaries" },
  {
    $match: {
      country: { $in: ["Germany", "United Kingdom"] },
      "salaries.jobTitle": {
        $in: ["Software Engineer", "Senior Software Engineer"],
      },
    },
  },
  {
    $group: {
      _id: { country: "$country", jobTitle: "$salaries.jobTitle" },
      avgPayPercentile10: { $avg: "$salaries.payPercentile10" },
      avgPayPercentile90: { $avg: "$salaries.payPercentile90" },
    },
  },
  { $sort: { avgPayPercentile90: -1 } },
  {
    $project: {
      _id: 0,
      jobTitle: "$_id.jobTitle",
      country: "$_id.country",
      avgPayPercentile10: 1,
      avgPayPercentile90: 1,
    },
  },
]);
```

# Primjeri agregacija

6. Koja je prosečna ocena benefita u Londonu koji u svojim uslugama imaju benefit "rad od kuće"?


– vreme izvršavanja:

 00:00:00.185

```
// Koja je prosečna ocena benefita u Londonu koji u svojim uslugama imaju benefit "rad od kuće"?
db.glassdoor.aggregate([
  {
    $match: {
      $and: [
        { location: "London" },
        {
          $or: [
            { "benefits.comment": { $regex: "work from home" } },
            { "benefits.comment": { $regex: "Work from home" } },
          ],
        },
      ],
    },
  },
  { $group: { _id: null, average_benefit_rating: { $avg: "$benefitRating" } } },
  {
    $project: {
      _id: "Average benefit rating",
      average_rating: { $round: ["$average_benefit_rating", 2] },
    },
  },
]);
```


# Primjeri agregacija

7. Koja je najcesce rangirana industrija u Londonu? – vreme izvorsavanja:

 00:00:00.223

```
//Koja je najcesce rangirana industrija u Londonu?
db.glassdoor.aggregate([
  { $match: { location: "London" } },
  {
    $group: {
      id: {
        industry: "$industry",
        industryId: "$industryId",
        numberOfRatings: "$numberOfRatings",
      },
    },
  },
  {
    $project: {
      industry: "$_id.industry",
      number: "$_id.numberOfRatings",
      location: "$location",
    },
  },
  { $match: { number: { $gt: 0 } } },
  { $sort: { number: -1 } },
  { $project: { most_rated_industry: "$industry" } },
  { $limit: 1 },
]);
```

# Primjeri agregacija

8. Koja je najcesca firma u Srbiji koja je ocenjena bar jednom, a radi za posao Softverskog inzinjera ili front end developera? – vreme izvorsavanja:  00:00:00.180

```
db.glassdoor.aggregate([
  { $match: { country: "Serbia" } },
  {
    $match: {
      $or: [
        { jobTitle: { $regex: "Software" } },
        { jobTitle: { $regex: "software" } },
        { jobTitle: { $regex: "front" } },
        { jobTitle: { $regex: "Front" } },
      ],
    },
  },
  {
    $group: {
      _id: { name: "$empName", empId: "$empId", empSize: "$empSize" },
      num: { $sum: "$numOfRatings" },
    },
  },
  { $project: { emp: "$_id.name", num: "$num" } },
  { $match: { num: { $gt: 0 } } },
  { $sort: { num: -1 } },
  { $limit: 1 },
  { $project: { emp: "$_id.name", num: "$num" } },
]);
```

# Primjeri agregacija

9. Izlistaj koji poslovi imaju benefit sportskih usluga, kao i koliko ih ima? – vreme izvršavanja:  00:00:00.708

```
db.glassdoor.aggregate([
  {
    $match: {
      $or: [
        { "benefits.comment": { $regex: "Sport" } },
        { "benefits.comment": { $regex: "sport" } },
        { "benefits.comment": { $regex: "sports" } },
        { "benefits.comment": { $regex: "Sports" } },
      ],
    },
  },
  { $project: { jobTitle: "$jobTitle" } },
  { $group: { _id: "$jobTitle", count: { $sum: 1 } } },
  { $project: { jobTitle: "$_id", num_of_jobs_with_this_benefit: "$count" } },
  { $sort: { num_of_jobs_with_this_benefit: -1, _id: 1 } },
  { $limit: 5 },
]);
```



# Primjeri agregacija

10. Koji su top 5 industrija u kojima Softverski inženjeri zaraduju najviše para? – vreme izvršavanja:  00:00:00.225

```
db.glassdoor.aggregate([
  { $unwind: "$salaries" },
  { $match: { jobTitle: "Software Engineer" } },
  {
    $group: {
      _id: { industry: "$industry", industryId: "$industryId" },
      average: { $avg: "$salaries.payPercentile90" },
    },
  },
  {
    $project: {
      industry: "$_id.industry",
      average_salary: { $round: ["$average", 2] },
    },
  },
  { $sort: { average_salary: -1 } },
  { $limit: 5 },
]);
```

# Logicka sema prilagodjena agregacijama

- Sastoji se iz 5 kolekcija: jobs, salaries, benefits, reviews, salary\_per\_job
- Kolekcije su dobijene primenom sablona baketiranja i proracunavanja na postojece kolekcije
- Grupisanje je vrseno vecinom po drzavama i lokacijama jer su se ti atributi cesto koristili za grupisanje u agregacijama

# Kolekcija jobs

- Osmisljena kao osnovni prikaz poslova
- Dobijena je uklanjanjem suvisnih kolona koje nisu potrebne za osnovno prikazivanje i dodavanje indexa za države i gradove zbog brzih pretraga po njima

▼ (43) { _id : { 7 fields } }	{ 3 fields }	Document
▼ { _id }	{ 7 fields }	Object
jobTitle	Database Engineer	String
country	India	String
location	Hyderabad	String
empName	Zenoti	String
empSize	201-500	String
industry	Computer Hardware & Software	String
benefitRating	0.0	Double
jobListingCount	1.0	Double
number	0	Int32

# Skripta za kreiranje kolekcije jobs

```
100, 5 minutes ago | 1 author (100)  
db.getCollection("jobs").createIndex({ "_id.country": 1 });  
db.getCollection("jobs").createIndex({ "_id.location": 1 });
```

```
db.getCollection("glassdoor").aggregate(  
[  
  {  
    $group: {  
      _id: {  
        jobTitle: "$jobTitle",  
        country: "$country",  
        location: "$location",  
        empName: "$empName",  
        empSize: "$empSize",  
        industry: "$industry",  
        benefitRating: "$benefitRating",  
        numberOfRatings: "$numberOfRating",  
      },  
      jobListingCount: { $sum: 1 },  
    },  
  },  
  {  
    $project: {  
      _id: {  
        jobTitle: "$_id.jobTitle",  
        country: "$_id.country",  
        location: "$_id.location",  
        empName: "$_id.empName",  
        empSize: "$_id.empSize",  
        industry: "$_id.industry",  
        benefitRating: "$_id.benefitRating",  
        numberOfRatings: "$_id.numberOfRating",  
      },  
      jobListingCount: 1,  
    },  
  },  
  { $out: { db: "sbp-v2", coll: "jobs" } },  
],  
{ allowDiskUse: true }  
);
```

# Kolekcija salaries

Dobijena baketiranjem i proracunavanjem osnovnih informacija o platama kompanija

▼ { } (1) { _id : { 2 fields } }	{ 9 fields }	Document
▼ { } _id	{ 2 fields }	Object
{ } jobTitle	Intern Project Manager	String
{ } country	FR	String
{ } avgPayPercentile10	14158.126760216765	Double
{ } avgPayPercentile90	15353.187009734096	Double
{ } maxPayPercentile10	14172.448569825296	Double
{ } maxPayPercentile90	15497.40157551932	Double
{ } minPayPercentile10	14143.804950608233	Double
{ } minPayPercentile90	15208.972443948873	Double
{ } jobListingCount	2.0	Double
▼ { } jobDetails	[ 2 elements ]	Array
▼ { } 0	{ 5 fields }	Object
{ } location	Paris	String
{ } empName	Qubit	String
{ } empSize	201-500	String
{ } industry	Computer Hardware & Software	String
{ } benefitRating	4.421052631578948	Double
> { } 1	{ 5 fields }	Object

# Skripta za kreiranje kolekcije salaries

```
db.getCollection("salaries").createIndex({ "_id.country": 1 });
db.getCollection("salaries").createIndex({ "_id.location": 1 });
```

```
db.getCollection("glassdoor").aggregate([
  { $unwind: "$salaries" },
  {
    $group: {
      _id: { jobTitle: "$salaries.jobTitle", country: "$country" },
      avgPayPercentile10: { $avg: "$salaries.payPercentile10" },
      avgPayPercentile90: { $avg: "$salaries.payPercentile90" },
      maxPayPercentile10: { $max: "$salaries.payPercentile10" },
      maxPayPercentile90: { $max: "$salaries.payPercentile90" },
      minPayPercentile10: { $min: "$salaries.payPercentile10" },
      minPayPercentile90: { $min: "$salaries.payPercentile90" },
      jobListingCount: { $sum: 1 },
      jobDetails: {
        $push: {
          location: "$location",
          empName: "$empName",
          empSize: "$empSize",
          industry: "$industry",
          benefitRating: "$benefitRating",
          numberOfRatings: "$numberOfRating",
        },
      },
    },
  },
  {
    $project: {
      _id: { jobTitle: "$_id.jobTitle", country: "$_id.country" },
      avgPayPercentile10: 1,
      avgPayPercentile90: 1,
      maxPayPercentile10: 1,
      maxPayPercentile90: 1,
      minPayPercentile10: 1,
      minPayPercentile90: 1,
      jobListingCount: 1,
      jobDetails: 1,
    },
  },
  { $out: { db: "sbp-v2", coll: "salaries" } },
  { allowDiskUse: true }
]);
```

# Kolekcija benefits

Dobijena baketiranjem informacija o benefitima kompanija

▼ (1) { _id : { 6 fields }}	{ 4 fields }	Document
▼ { _id	{ 6 fields }	Object
" jobTitle	Sales Consultant	String
" country	England	String
" location	London	String
rating	1.0	Double
" currentJob	true	String
" comments	basic health insurance after you bill ₪200,000	String
number	3.0	Double
benefitRating	3.333333333333335	Double
▼ { jobDetails	[ 3 elements ]	Array
> { 0	{ 4 fields }	Object
▼ { 1	{ 4 fields }	Object
" empName	Venquis	String
" empSize	51-200	String
" industry	Staffing & Outsourcing	String
benefitRating	3.333333333333335	Double
> { 2	{ 4 fields }	Object

# Skripta za kreiranje kolekcije benefits

```
db.getCollection("glassdoor").aggregate([
  {
    $unwind: "$benefits",
  },
  {
    $group: {
      _id: {
        jobTitle: "$jobTitle",
        comments: "$benefits.comment",
        location: "$location",
        benefitRating: "$benefitRating",
      },
      number: { $sum: 1 },
    },
  },
  {
    $project: {
      _id: {
        jobTitle: "$_id.jobTitle",
        comments: "$_id.comments",
        location: "$_id.location",
        benefitRating: "$_id.benefitRating",
      },
      number: "$number",
    },
  },
  { $out: { db: "sbp-v2", coll: "benefits" } },
],
{ allowDiskUse: true }
);
```



# Kolekcija reviews

Dobijena baketiranjem i proračunavanjem osnovnih informacija o ocenama zaposlenih o kompaniji

▼ (2) { _id : Brightcove }	{ 7 fields }	Document
"_id"	Brightcove	String
avgOverallRating	5.0	Double
avgCompBenefitsRating	4.5	Double
avgCultureValuesRating	5.0	Double
avgSeniorManagmentRating	4.5	Double
avgWorkLifeBalanceRating	5.0	Double
reviewsCount	58.0	Double

# Skripta za kreiranje kolekcije reviews

```
db.getCollection("glassdoor").aggregate(  
  [  
    { $unwind: "$reviews" },  
    {  
      $group: {  
        _id: "$empName",  
        avgOverallRating: { $avg: "$reviews.overallRating" },  
        avgCompBenefitsRating: { $avg: "$reviews.compBenefitsRating" },  
        avgCultureValuesRating: { $avg: "$reviews.cultureValuesRating" },  
        avgSeniorManagmentRating: { $avg: "$reviews.seniorManagmentRating" },  
        avgWorkLifeBalanceRating: { $avg: "$reviews.workLifeBalanceRating" },  
        reviewsCount: { $sum: 1 },  
      },  
    },  
    {  
      $project: {  
        _id: 1,  
        avgOverallRating: 1,  
        avgCompBenefitsRating: 1,  
        avgCultureValuesRating: 1,  
        avgSeniorManagmentRating: 1,  
        avgWorkLifeBalanceRating: 1,  
        reviewsCount: 1,  
      },  
    },  
    { $out: { db: "sbp-v2", coll: "reviews" } },  
  ],  
  { allowDiskUse: true }  
);
```



# Kolekcija salary\_per\_job

Dobijena baketiranjem po razlicitim poslovima


▼ (4) { _id : { 2 fields }}	{ 2 fields }	Document
▼ { _id	{ 2 fields }	Object
industry	Computer Hardware & Software	String
jobTitle	Web Application Developer - Internal Tools	String
123 average_salary	46855.23	Double

# Skripta za kreiranje kolekcije salary\_per\_job

```
db.getCollection("glassdoor").aggregate([
  {
    $unwind: "$salaries",
  },
  {
    $group: {
      _id: {
        industry: "$industry",
        jobTitle: "$jobTitle",
      },
      average_salary: { $avg: "$salaries.payPercentile90" },
    },
  },
  {
    $project: {
      _id: {
        industry: "$_id.industry",
        jobTitle: "$_id.jobTitle",
      },
      average_salary: { $round: ["$average_salary", 2] },
    },
  },
  { $out: { db: "sbp-v2", coll: "salary_per_job" } },
],
{ allowDiskUse: true }
);
```

# Primjeri agregacija nad prilagodjenim semama

1. 10 gradova sa najviše oglasa za posao u Francuskoj - vreme izvršavanja

 00:00:00.010

```
db.getCollection("jobs").aggregate([
  {
    $match: {
      $and: [{ "_id.country": "France", "_id.location": { $ne: "" } }],
    },
  },
  {
    $group: {
      _id: "$_id.location",
      jobListingCount: { $sum: "$jobListingCount" },
    },
  },
  { $sort: { jobListingCount: -1 } },
  { $limit: 10 },
]);
```

# Primjeri agregacija nad prilagodjenim semama

2. Prosečna plata u zavisnosti od velicine firme u Velikoj Britaniji – vreme izvršavanja:  00:00:00.016

```
db.getCollection("salaries").aggregate([
  { $match: { "_id.country": "United Kingdom" } },
  { $unwind: "$jobDetails" },
  {
    $group: {
      _id: "$jobDetails.empSize",
      payPercentile90: { $avg: "$avgPayPercentile90" },
    },
  },
  { $sort: { payPercentile90: -1 } },
]);
```


# Primjeri agregacija nad prilagodjenim semama

3. 5 Najplacenijih poslova u Velikoj Britaniji – vreme izvršavanja:  00:00:00.005

```
//3. 5 Najplacenijih poslova u Velikoj Britaniji
db.getCollection("salaries").aggregate([
  { $match: { "_id.country": "United Kingdom" } },
  { $sort: { maxPayPercentile90: -1 } },
  { $limit: 5 },
  {
    $project: {
      _id: 0,
      jobTitle: "$_id.jobTitle",
      maxPayPercentile90: "$maxPayPercentile90",
    },
  },
]);
```

# Primjeri agregacija nad prilagodjenim semama

4. Najbolje prosečno ocenjene kompanije sa bar 50 ocena zaposlenih – vreme izvršavanja:


 00:00:00.016

```
db.getCollection("reviews").aggregate([
  { $match: { reviewsCount: { $gt: 50 } } },
  { $sort: { avgOverallRating: -1, reviewsCount: -1 } },
]);
```



# Primjeri agregacija nad prilagodjenim semama

5. Plate programera i seniora u Velikoj Britaniji i Njemacka – vreme izvršavanja:


 00:00:00.009

```
//5. Plate programera i seniora u Velikoj Britaniji i Njemacka
db.getCollection("glassdoor").aggregate([
  { $unwind: "$salaries" },
  [
    You, 13 hours ago • Finished queries
    {
      $match: {
        country: { $in: ["Germany", "United Kingdom"] },
        "salaries.jobTitle": {
          $in: ["Software Engineer", "Senior Software Engineer"],
        },
      },
    },
    {
      $group: {
        _id: { country: "$country", jobTitle: "$salaries.jobTitle" },
        avgPayPercentile10: { $avg: "$salaries.payPercentile10" },
        avgPayPercentile90: { $avg: "$salaries.payPercentile90" },
      },
    },
    { $sort: { avgPayPercentile90: -1 } },
    {
      $project: {
        _id: 0,
        jobTitle: "$_id.jobTitle",
        country: "$_id.country",
        avgPayPercentile10: 1,
        avgPayPercentile90: 1,
      },
    },
  ],
]);
```

# Primjeri agregacija nad prilagodjenim semama

6. Koja je prosečna ocena benefita u Londonu koji u svojim uslugama imaju benefit "rad od kuće"?

– vreme izvršavanja:

 00:00:00.106

```
db.benefits.aggregate([
  {
    $match: {
      $and: [
        { "_id.location": "London" },
        {
          $or: [
            { "_id.comments": { $regex: "work from home" } },
            { "_id.comments": { $regex: "Work from home" } },
          ],
        },
      ],
    },
  },
  {
    $group: {
      _id: null,
      average_benefit_rating: { $avg: "$_id.benefitRating" },
    },
  },
  {
    $project: {
      _id: "Average benefit rating",
      average_rating: { $round: ["$average_benefit_rating", 2] },
    },
  },
]);
```


# Primjeri agregacija nad prilagodjenim semama

7. Koja je najcesce rangirana industrija u Londonu? – vreme izvršavanja:

🕒 00:00:00.007

```
db.jobs.aggregate([
  { $match: { "_id.location": "London" } },
  {
    $project: {
      industry: "$_id.industry",
      number: "$number",
      location: "$_id.location",
    },
  },
  { $match: { number: { $gt: 0 } } },
  { $sort: { number: -1 } },
  { $project: { most Rated industry: "$industry" } },
  { $limit: 1 },
]);
```

# Primjeri agregacija nad prilagodjenim semama

8. Koja je najcesca firma u Srbiji koja je ocenjena bar jednom, a radi za posao Softverskog inzinjera ili front end developera? – vreme izvorsavanja:  00:00:00.003

```
db.jobs.aggregate([
  { $match: { "_id.country": "Serbia" } },
  {
    $match: {
      $or: [
        { "_id.jobTitle": { $regex: "Software" } },
        { "_id.jobTitle": { $regex: "software" } },
        { "_id.jobTitle": { $regex: "front" } },
        { "_id.jobTitle": { $regex: "Front" } },
      ],
    },
  },
  { $project: { emp: "$_id.name", num: "$number" } },
  { $match: { num: { $gt: 0 } } },
  { $sort: { num: -1 } },
  { $limit: 1 },
  { $project: { emp: "$_id.empName", num: "$num" } },
]);
```

# Primjeri agregacija nad prilagodjenim semama

9. Izlistaj koji poslovi imaju benefit sportskih usluga, kao i koliko ih ima? – vreme izvršavanja:  00:00:00.310

```
db.benefits.aggregate([
  {
    $match: {
      $or: [
        { "_id.comments": { $regex: "Sport" } },
        { "_id.comments": { $regex: "sport" } },
        { "_id.comments": { $regex: "Sports" } },
        { "_id.comments": { $regex: "sports" } },
      ],
    },
  },
  { $project: { jobTitle: "$_id.jobTitle" } },
  { $group: { _id: "$jobTitle", count: { $sum: 1 } } },
  { $project: { jobTitle: "$_id", num_of_jobs_with_this_benefit: "$count" } },
  { $sort: { num_of_jobs_with_this_benefit: -1, _id: 1 } },
  { $limit: 5 },
]);
```

# Primjeri agregacija nad prilagodjenim semama

10. Koji su top 5 industrija u kojima Softverski inzinjeri zaradjuju navise para? – vreme izvorsavanja:

00:00:00.035

```
db.salary_per_job.aggregate([
  { $match: { "_id.jobTitle": "Software Engineer" } },
  {
    $project: { industry: "$_id.industry", average_salary: "$average_salary" },
  },
  { $sort: { average_salary: -1 } },
  { $limit: 5 },
]);
```

# Agregacije

1. 10 gradova sa najviše oglasa za posao u Francuskoj
2. Prosečna plata u zavisnosti od velicine firme u Velikoj Britaniji
3. 5 Najplacenijih poslova u Velikoj Britaniji
4. Najbolje prosečno ocenjene kompanije sa bar 50 ocena zaposlenih
5. Plate programera i seniora u Velikoj Britaniji i Njemacka
6. Koja je prosečna ocena benefita u Londonu koji u svojim uslugama imaju benefit "rad od kuće"?
7. Koja je najcesce rangirana industrija u Londonu?
8. Koji je najcesci emp u Srbiji koji je ocenjen bar jednom, a radi za posao Softverskog inzinjera ili front end developera?
9. Izlistaj koji poslovi imaju benefit sportskih usluga, kao i koliko ih ima?
10. Koji su top 5 industrija u kojima Softverski inzinjeri zaradjuju navise para?

# Poredjenje performansi

