Reel Picks

CSC468: Introduction to Cloud Computing
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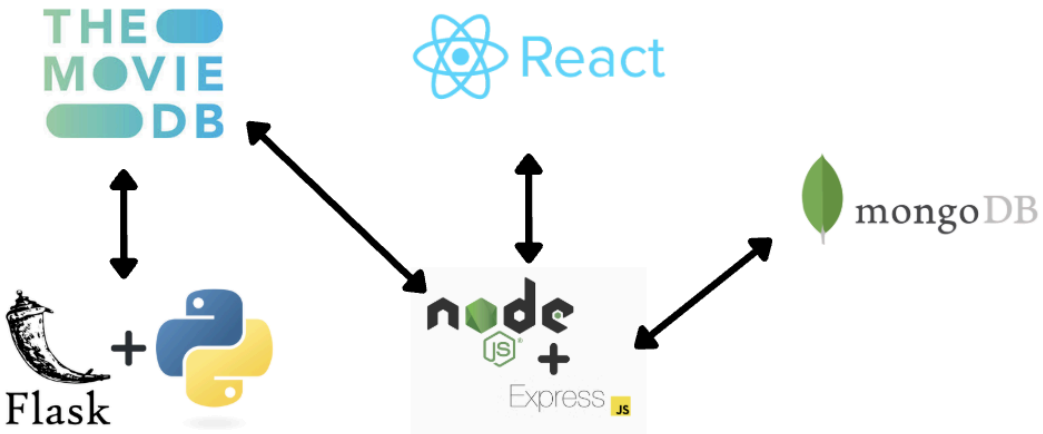
Technical Report

Chapter 1: Team Vision

At Reel Picks, we're on a mission to make movie nights a whole lot easier. We envision a platform that helps people discover new films they'll love, without the hassle of endless browsing. Our goal is to create a user-friendly interface that combines a vast movie database with the power of AI-driven recommendations. By doing so, we hope to provide personalized suggestions that feel tailored to each individual's unique tastes. We're also exploring features that let users log their past favorites, which will require us to implement secure authentication services to keep everything safe and private. Behind the scenes, our high-level architecture is designed to bring all these components together seamlessly, using Node.js' API to ensure a smooth and efficient experience. Ultimately, we want to make the question "What are we going to watch tonight?" a thing of the past, and replace it with a world of endless entertainment possibilities.

Chapter 2: Team Proposal

To build our movie recommendation platform, we'll start by creating a user-friendly interface using React UI with Bootstrap, making it easy for users to interact with our platform and find movies that interest them. When a user makes a request, React will send a signal to our Node.js API, which will then retrieve a list of potential movie recommendations from our external API, The Movie Database (TMDB). Our Node.js API will also work closely with our AI-powered recommendation engine to generate personalized suggestions based on the user's requests. We'll use MongoDB to keep all of our users' data organized and secure, with an authentication service in place to protect sensitive information.
To make our recommendations more accurate, we'll develop a set of criteria for similarity scores between what the user is looking for and their past viewing history. This will enable our AI-powered engine to suggest movies that are tailored to each individual's unique tastes. Below is an idea of what our application architecture will look like:



Chapter 3: Docker

In the deployment of our full stack movie recommendation website, each component (Frontend, Backend, Database, AI-Recommender) are containerized separately. Within our GitHub repository, there are Dockerfiles contained within each of our project component subfolders. They are responsible for creating the individual docker images for each component to run properly.

Building the Frontend Image:

- To build the frontend image, we use the Dockerfile located in the Project/Frontend directory.
- The Dockerfile is as follows:

```
# Project/Frontend/Dockerfile
FROM node:16
WORKDIR /app
COPY package*.json ./
RUN npm install
COPY . .
EXPOSE 3000
CMD ["npm", "start"]
```

- This Dockerfile uses the official Node.js 16 image as the base image, sets up the working directory, copies the package.json file, installs the dependencies, copies the application code, exposes port 3000, and sets the default command to start the application.
- To build the frontend image, we run the following command: “docker build -t frontend”

Building the Backend Image:

- To build the backend image, we use the Dockerfile located in the Project/Backend directory.
- The Dockerfile is as follows:

```
# Project/Backend/Dockerfile
FROM node:16
WORKDIR /app
COPY package*.json ./
RUN npm install
COPY . .
EXPOSE 5001
CMD ["node", "server.js"]
```

- This Dockerfile uses the official Node.js 16 image as the base image, sets up the working directory, copies the package.json file, installs the dependencies, copies the application code, exposes port 5001, and sets the default command to start the server.
- To build the backend image, run the following command: “docker build -t backend”
- Building the MongoDB Image:
- We use the official MongoDB image from Docker Hub.
- To pull the image, run the following command: “docker pull mongo:4.4”

Testing and Preliminary Results:

We tested the individual images by running them separately and verifying that they work as expected. We also tested the communication between the frontend and backend images by running them together using Docker Compose.

Data Collection and Management:

- We use MongoDB as our database management system. We created a MongoDB container using the official image and configured it to persist data to a volume. We also created a Docker Compose file to manage the services and volumes.
- The Docker Compose file is as follows:

```yaml
version: '3'

services:
  backend:
    build: ./Backend
    env_file:
      - ./Backend/.env
    depends_on:
      - mongo

  frontend:
    build: ./Frontend
    ports:
      - "3000:3000"
    depends_on:
      - backend
    stdin_open: true
    tty: true

  mongo:
    image: mongo:4.4
    volumes:
      - mongo-data:/data/db

volumes:
  mongo-data:
```

- This Docker Compose file defines three services: backend, frontend, and mongo. The backend service depends on the mongo service, and the frontend service depends on the backend service. The mongo service uses a volume to persist data.

- We also created a data table to manage user data. The data table is defined in the Project/Backend/models/user.js file:

```
const mongoose = require('mongoose');

const userSchema = new mongoose.Schema({
  username: String,
  password: String
});

const User = mongoose.model('User', userSchema);

module.exports = User;
```

- This schema defines a User model with two fields: username and password, which we use for user authentication.

Chapter 4: Final Results

We ended up implementing our front-end with React and Bootstrap for ease-of-use and component reusability. We used Node.js with Express for our communication between front-end, external API calls to TMDB, communication with our MongoDB user-authentication system, and our external AI-recommendation engine with Flask and Python. We were able to successfully containerize our components with docker, and using our docker compose file we were able to successfully deploy our web application over the cloud. Our application ended up containing user login information, a quick recommendation system, a key-word query through the data-base, our AI-recommendation engine, popular, and trending movies (refreshed every 24 hours). We determined in our previous deliverable that our project was on a realistic timeline and that seems to be the case. Our group concurred that we created an achievable goal. Our team learned a lot throughout the process of completing this project. For some of us, it was our first time completing a full-stack application of any sort. Completing a web application was both difficult and empowering. Learning how REST API calls work, how to customize and properly reuse front-end components, concepts of containerization, cloud deployment, user-authorization and authentication, dockerfile, JavaScript, CSS, MongoDB, and Linux skills were all either developed or improved. Moving forward, additional updates could continue to be made to our front-end usability, storing user history, and improving our AI-integration.

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Education:

West Chester University of Pennsylvania, Honors College 2022 - 2026
Bachelor of Science, Computer Science, GPA: 3.643
Computer Security Certificate Track
Minor in Spanish
Minor in Civic and Professional Leadership Development (Concentration in STEM)

University of Barcelona 2024
Advanced Spanish coursework

Awards:

Council of Trustees Scholarship - full tuition 2022-2026
Dean's List 2023, 2024
Lake Heritage Fishing & Women's Club Award 2022
University Student Housing Honors Scholarship 2022
Realtors Association of York & Adams Counties Scholarship 2022

Scholarly Activities and Affiliations:

Honors Student Association 2022 - 2024
Travel Abroad Term 2024
Student Representative for Honors College Modernization 2024
West Chester Competitive Programming Contest 2023

Relevant Projects

- Linux System Administration Project - Linux administrator tasks and procedures
- Genetic Programming Project - Pseudo-randomly generated machine learning self-evaluating expression-tree
- Designing a security policy for a university structured organization

Community Service and Volunteerism:

North Star of Chester County 2024
- Local 501(c)(3) non-profit working with ALICE families: grant proposal, fall fundraiser, volunteer events, bake sale, etc.

Adopt-a-Block 2022 - 2023
- Community-based trash clean up program

Employment:

Mela Kitchen 2020 - 2023
- *Food service*
    - Dishwashed, hosted, served
    - Proved trainability and upward mobility
    - Familiarized with customer service and customer relations

Gettysburg Benefits Administrators 2023 - 2024
- *Quality Assurance Analyst*
    - Quality reviewer for both build-from-scratch and re-enrolls for insurance enrollment websites
    - Increased percentage of first-pass tests
    - Entrusted with process improvement for quality analysts
    - Working with Salesforce inbound requests
    - Familiarity with insurance vocabulary, concepts, carriers, brokers

- *Case Builder*
    - Trained as a case builder, building insurance enrollment websites
    - Familiarized with the product development process
    - Worked in a technical environment
    - Worked with a technical team

Kelly Benefits 2024 - present

- *Quality Assurance Analyst*
    - Quality Review Analyst for build-from-scratch and re-enrolling insurance enrollment websites
    - Helped train new quality analysts for the role
    - Entrusted with process improvements and system engineering
    - Working within a formal corporate structure
    - Weekly improvement and performance reports
- *Case Builder*
    - Trained as a case builder, building insurance enrollment websites
    - Reintroduced to the product development process
    - Continued working in a technical environment
    - Continued working with a technical team
    - Weekly improvement and performance reports

Special Skills and Certifications:

Programming Languages: Java, C, C++, Bash Script, HTML, CSS, MATLAB, Haskell
Operating Systems: MacOS, Windows, Linux (Ubuntu and Manjaro Distributions)
Other Tools: Selerix, WireShark, Nmap, Cisco-Packet Tracer, SPSS, Git, GDB, Office365
HIPPA Certified**,** CITI Certified

References Available Upon Request

Nicholas Resto

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www.linkedin.com/in/nick-resto/

Education:

West Chester University of Pennsylvania *West Chester, PA*

Bachelor of Science in Computer Science *August 2022 – May 2026*

Minor in Women's and Gender Studies *August 2022 – December 2025*

Experience:

Advanced Computer Technician *February 2025 – Present*

Best Buy, Geek Squad *Downingtown, PA*

- Resolved complex software and hardware repairs efficiently and with top-level accuracy.
- Complete in-depth malware removal and operating system restoration
- Ensuring client satisfaction and QoS through accurate documentation and execution of repairs
- Navigated through complex file/data recoveries and transfers.
- Effectively communicated with clients over the phone and in person to explain diagnostic discoveries and make recommendations for protecting their devices and resolving issues.

IT Sales Consultant *December 2023 February 2025*

Best Buy, Geek Squad *Downingtown, PA*

- Effectively managed a ticketing system, properly managing time for all clients.
- Greet and assist clients, actively listen to their needs, and provide recommendations/solutions based on their requirements.
- Thoroughly explained product features, specifications, and held in-depth demonstrations for clients.
- Performed necessary repairs/fixes to client devices in a timely manner.

Apple Authorized Service Provider (AASP) *December 2023 –February 2025*

Best Buy, Geek Squad *Downingtown, PA*

- Troubleshoot Apple products such as Mac, iPhone, iPad, Apple Watch, AirPods.

- Diagnosed and repaired complex hardware and software issues on Apple devices in compliance with AASP standards.
- Performed same-day Display, Battery, Camera, and Back Glass repairs on iPhones.

Additional Experience:

Warehouse Associate *November 2022 – December 2023*

Raymour and Flanigan *Exton, PA*

- Provided support in managing inventory control and optimizing related processes to ensure efficiency and accuracy within the warehouse.
- Expertly assemble a variety of new furniture pieces, following guidelines to ensure quality and durability.

Dishwasher *March 2019 – August 2022*

Estrella Tacos y Mas *Downingtown, PA*

- Cleaned, sanitized, and restocked dishes, glassware, utensils, and pots, operating machines to proper company and manufacturer standards.
- Maintained a safe, clean environment in alignment with sanitation guidelines by routinely cleaning and organizing stockroom, storage areas, and other kitchen areas.

Technical Skills:

- Languages: Java, Python, Haskell, Swift, C
- Skilled in home-networking setup and maintenance, including installing routers, troubleshooting connectivity issues, and optimizing network performance for reliable and secure connections.
- Experienced in 3D printing: 3D modeling, model preparation, slicing, printer calibration, and print optimization.
- Skilled in assembling, troubleshooting, diagnosing, and repairing computer systems, ensuring optimal performance and reliability.
- Well-versed in operating systems, including macOS, iOS, Windows 10/11, and foundational Linux

Brook Kassa

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West Chester University of Pennsylvania
West Chester, PA

Bachelor of Science in Computer Science — Expected Graduation Date: June 2025

Relevant Coursework:

Data Communications and Networking

- Studied computer networking fundamentals
- Used Cisco Packet Tracer to create network topologies
- Worked with Wireshark to examine packets
- Lab assignments included creating Python projects
- Units in Cybersecurity
- Studied cybersecurity & networking fundamentals
- Studied malicious/ethical hacking and types of hacking attacks
- Tested firewalls

Software Engineering (Capstone Requirement)

- Study of topics pertaining to: Object-Oriented Programming, Data Structures, Interfaces, Run-time and Compile-time Polymorphism, and Inheritance

Computer Systems

- Studied computer systems fundamentals
- Analyzed assembly code of C programs

Data Structures & Algorithms

- Solved data algorithm problems related to recursion, hashing, and linked lists

Introduction to Cloud Computing

- Studied cloud computing technologies
- Virtualization, containerization, and orchestration

Certificates & Activities

- **Microsoft Certified: Azure Administrator**
- **Microsoft Certified: Azure Fundamentals**
- **Microsoft AI Skills Challenge**
- **Cisco Certified Support Technician**
- **West Chester University Computer Science Club**
- **Published AWS Web App (See blog)**

Skills

- Cloud Computing
- Microsoft Azure
- Computer Networking
- Java, C, Javascript, React, & Python Programming
- Site Reliability Engineering
- Network Management
- DevOps
- Cyber Security

Sales Associate
Auto Zone | West Chester, PA
September 2019 – March 2020

- Helped customers find the parts they needed
- Conducted Check Engine Light inspections to diagnose auto issues and recommended products or methods to help
- Performed general car maintenance (poured engine oil, switched old bulbs for new ones, tested and swapped in new batteries)

Lobby Attendant
Valley Forge Towers | King of Prussia, PA
June 2017 – September 2018

- Worked the front desk at the Valley Forge Towers gym
- Was responsible for operating events in the club party room
- Handled maintenance within the clubhouse