**ASSIGNMENT 1**

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**Subject - FOI**

**Q1 Categorize the taking after beneath Information Sciences, Machine Learning, Computer**

**Vision and NLP.**

The most recent innovative progressions have made our lives convenient.

Google Domestic, Alexa and Siri have been a gigantic offer assistance to non-tech adroit

individuals. Highlights like Facial acknowledgment and Facelock have included extra security to

our contraptions. These headways have moreover contributed in making our needs more

receptive and helpful. Presently you’ll indeed check the costs with Cost comparison websites and

arrange foodstuffs online with chatbots. Did you know that you simply can indeed discover how

you&#39;re attending to see once you develop ancient? Faceapps and Snapchat channels have made

this possible!

**Solution :**

### Information Sciences:

* Price comparison websites
* Ordering groceries online

**Machine Learning:**

* Alexa, Google Home, Siri (use machine learning for voice recognition, personalized responses, and predictive analysis)
* FaceApps and Snapchat filters (use machine learning for facial transformation and effects)
* Chatbots (use machine learning for conversation handling and decision-making)

**Computer Vision:**

* Facial recognition and FaceLock (use computer vision to detect and verify faces)
* Snapchat filters (apply computer vision to detect and overlay filters on faces)

**NLP (Natural Language Processing):**

* Google Home, Alexa, Siri (use NLP to understand and process human language)
* Chatbots (use NLP for understanding user queries and generating responses)

The morality of information collected by different applications depends on several factors, including **consent**, **transparency**, **purpose**, and **security**. Here’s a breakdown of the moral considerations:

**Q2. Is information which is collected by different applications moral in nature? Legitimize your answer**

**1. Consent and Transparency:**

* **Moral if**: The application clearly informs users about what data is being collected, why it is collected, and how it will be used. Users must give informed consent before the data is collected.
* **Immoral if**: The application collects data without users' knowledge or consent, or buries the details in complex, unreadable terms and conditions.

**2. Purpose of Data Collection:**

* **Moral if**: The data is collected for legitimate purposes, such as improving user experience, personalizing services, or ensuring security. It should not go beyond the stated purpose.
* **Immoral if**: The data is used for purposes other than what was originally stated, such as selling personal information to third parties without user consent or for manipulative practices.

**3. Data Security and Privacy:**

* **Moral if**: The collected information is stored securely, and the application takes measures to protect it from unauthorized access or breaches. Respect for user privacy is prioritized.
* **Immoral if**: The application stores data insecurely, leading to data leaks or breaches, or if it shares sensitive information without ensuring adequate security.

**4. User Control:**

* **Moral if**: Users are given control over their data, such as options to delete, download, or modify their information at will. This respects their autonomy over their personal information.
* **Immoral if**: Users are not given any control over their data once it's collected, and the application does not provide clear mechanisms for data management.

**5. Extent of Data Collection:**

* **Moral if**: Only necessary data for the application’s functionality is collected. For example, if an app collects only the minimal data it needs to perform its service.
* **Immoral if**: The application collects excessive data that is unrelated to its core functionality or invades user privacy (e.g., collecting location data or microphone access without a justifiable need).

Data collection by applications is moral when it adheres to principles of consent, transparency, security, and user control. When these principles are violated, data collection becomes immoral, as it infringes on user privacy, autonomy, and trust.

**Q3. Autonomous vehicles or self-driving cars are already a reality in some cities around the world. What was the reason behind this invention? What software logic and hardware are needed to allow these cars to drive without hitting pedestrians or other vehicles? What legislation had to be passed to allow these cars on the road? Are there any moral issues?**

**1. Reason for Autonomous Vehicles:**

Autonomous cars were invented to reduce human error, improve road safety, provide convenience, and reduce traffic congestion and environmental impact.

**2. Software and Hardware Needed:**

* **Software**: Machine learning, AI, computer vision, sensor fusion, and decision-making algorithms.
* **Hardware**: LiDAR, radar, cameras, GPS, ultrasonic sensors, and high-performance computers.

**3. Legislation:**

Laws were passed for safety standards, testing permissions, liability, and data privacy. Countries also created insurance policies and ethical guidelines for these vehicles.

**4. Moral Issues:**

Key concerns include decision-making in accidents, liability, data privacy, job displacement, bias in AI, and equitable access to the technology.

**Q4. Discuss the latest inventions w.r.t AI enabled machines in the following field of -**

**Health Care**

**Environment**

**Agriculture**

**Solution :**

**1. Health Care:**

AI-enabled machines are advancing diagnostics, treatment, and personalized medicine. Examples include:

* **AI in medical imaging**: AI tools like IBM Watson and Google's DeepMind analyze scans to detect diseases like cancer more accurately.
* **Robotic surgery**: Systems like the **Da Vinci robot** assist surgeons in performing minimally invasive procedures with high precision.
* **AI-powered drug discovery**: AI helps in predicting potential drug candidates, speeding up the discovery process.

**2. Environment:**

AI is used to monitor and address environmental challenges:

* **AI for climate modeling**: Tools like Microsoft's AI for Earth predict climate changes and help manage resources.
* **Smart sensors**: AI-driven sensors monitor air quality, pollution, and water levels to provide real-time environmental data for better decision-making.
* **Wildlife conservation**: AI-powered drones and camera traps help track endangered species and detect illegal poaching activities.

**3. Agriculture:**

AI is transforming farming by improving efficiency and yield:

* **AI-powered drones**: Drones equipped with AI analyze crop health, detect pests, and optimize planting schedules.
* **Precision farming**: AI tools like John Deere’s AI tractors optimize seeding, watering, and fertilizer use.
* **Automated harvesting**: Robots equipped with AI are being used for tasks like picking fruits and sorting produce to reduce labor dependency and increase yield

**Q5. Consumers who bought this too bought this…’ we frequently see this when we shop on Amazon. What is the principle behind this phrase?**

**Solution :**

The principle behind the phrase "**Consumers who bought this also bought this**" is **collaborative filtering**, a key technique in **recommender systems**. It uses the behavior and preferences of many users to make personalized product suggestions. The system analyzes the purchase patterns of consumers and identifies relationships between products bought together by different customers. Based on this data, it recommends similar products to other users with similar shopping habits, helping guide them to items they might find useful or interesting.

**Q6. COMPLETE THE FOLLOWING**

Solution :

