Activity Diagram - Module Workflow

Partitioned by Active Modules

```mermaid
flowchart TD
    Start([Start System])

    subgraph DC[1. Data Collection Module]
        InitApp[Initialize App]
        DataExists{Data Exists?}
        StartScraping[Start Scraping]
        InitSelenium[Init Selenium]
        LoadCategories[Load Categories]
        MorePages{More Pages?}
        NavigatePhase[Navigate Phase]
        SaveCSV[Save to CSV]
        ExtractElements[Extract Elements]
        MoreProducts{More Products?}
        ExtractDetails[Extract Details]
        CreateRecord[Create Record]
    end

    subgraph IC[2. Image Collection Module]
        StartImageScraper[Start Image Scraper]
        ReadImageURLs[Read Image URLs]
        MoreImages{More Images?}
        ImagesReady[Images Ready]
        DownloadImage[Download Image]
        SaveDisk[Save to Disk]
    end

    subgraph DP[3. Data Preprocessing Module]
        LoadRawData[Load Raw Data]
        StartPreprocessing[Start Preprocessing]
        ProcessRow[Process Row]
        GenerateID[Generate ID]
        Group{Group?}
        CleanText[Clean Text]
        DataCleaned[Data Cleaned]
    end

    subgraph RE[4. Recommendation Engine]
        TrainModel[Train Model]
        BuildVocab[Build Vocab]
        VectorizeProducts[Vectorize Products]
        ModelReady[Model Ready]
    end

    subgraph UI[5. User Interface Module]
        LaunchUI[Launch UI]
        DisplayMainFrame[Display Main Frame]
        WaitInput[Wait Input]
        UserAction{User Action?}
        ShowDetails[Show Details]
        WishlistToggle[Wishlist Toggle]
        ThemeToggle[Theme Toggle]
        CompareProducts[Compare Products]
        SearchFilter[Search & Filter]
        CalculateSimilarity[Calculate Similarity]
        DisplayResults[Display Results]
    end

    End([Exit])
```

Flow labels:
- Data Exists? — No → Start Scraping
- More Pages? — Yes → Navigate Phase; No → Save to CSV
- More Products? — No; Yes → Extract Details
- More Images? — No → Images Ready; Yes → Download Image
- Group? — Yes; No → Clean Text
- User Action? — Details → Show Details; Wishlist → Wishlist Toggle; Theme → Theme Toggle; Compare → Compare Products; Search → Search & Filter; Exit → Exit