PERSONAL EXPENSE TRACKER (MONTHLY)

BY ALISHA KHAN

Project Goal

Build a personal banking expense tracker that:

- Extracts transactions from PDF bank statements
- Parses and cleans the data into structured format
- Automatically categorizes spending (e.g., Food, Transportation)
- Provides clear visual insights into spending behavior

In [20]:
```
!pip install pdfplumber
```

```
Requirement already satisfied: pdfplumber in c:\users\alish\anaconda3\lib\site-packages
(0.11.6)
Requirement already satisfied: pdfminer.six==20250327 in c:\users\alish\anaconda3\lib\s
ite-packages (from pdfplumber) (20250327)
Requirement already satisfied: pypdfium2>=4.18.0 in c:\users\alish\anaconda3\lib\site-p
ackages (from pdfplumber) (4.30.1)
Requirement already satisfied: Pillow>=9.1 in c:\users\alish\anaconda3\lib\site-package
s (from pdfplumber) (11.2.1)
Requirement already satisfied: cryptography>=36.0.0 in c:\users\alish\anaconda3\lib\sit
e-packages (from pdfminer.six==20250327->pdfplumber) (45.0.3)
Requirement already satisfied: charset-normalizer>=2.0.0 in c:\users\alish\anaconda3\li
b\site-packages (from pdfminer.six==20250327->pdfplumber) (2.0.4)
Requirement already satisfied: cffi>=1.14 in c:\users\alish\anaconda3\lib\site-packages
(from cryptography>=36.0.0->pdfminer.six==20250327->pdfplumber) (1.14.6)
Requirement already satisfied: pycparser in c:\users\alish\anaconda3\lib\site-packages
(from cffi>=1.14->cryptography>=36.0.0->pdfminer.six==20250327->pdfplumber) (2.20)
```

PDF EXTRACTION

In [7]:
```
import pdfplumber

with pdfplumber.open("Statements.pdf") as pdf:
    for page in pdf.pages:
        text = page.extract_text()
        print(text)
```

```
Here's what happened in your account this statement period
Amounts Amounts
Date Transactions withdrawn($) deposited($) Balance($)
Apr18 OpeningBalance 197.58
Apr19 Pointofsalepurchase 3.30 194.28
AposPres/5Gm6P6Hrln
Apr19 Pointofsalepurchase 12.81 181.47
AposDollarama#386EtobicokeONCA
Apr21 Pointofsalepurchase 3.30 178.17
AposPres/5Gn11Nqq6B
Apr22 Withdrawal 113.00 65.17
15483976FreeInteracE-Transfer
Apr22 Withdrawal 45.00 20.17
16232506FreeInteracE-Transfer
Apr23 Deposit 200.00 220.17
16850920FreeInteracE-Transfer
Apr23 Deposit 200.00 420.17
16852922FreeInteracE-Transfer
Apr23 Withdrawal 300.00 120.17
```

DATA PARSING AND CLEANING

In [21]:
```
import re
import pandas as pd

# pasting from above extraction
raw_text = """

"""

# Splitting text into lines
lines = raw_text.strip().split("\n")

records = []
i = 0

while i < len(lines):
    line = lines[i].strip()
    match = re.match(r"([A-Za-z]{3}\d{1,2})\s+(.+?)\s+([\d,.]+)\s+([\d,.]+)", line)

    if match:
        date = match.group(1)
        trans_type = match.group(2)
        amount = float(match.group(3).replace(',', ''))
        balance = float(match.group(4).replace(',', ''))

        # Checking next line for description
        description = ""
        if i + 1 < len(lines) and not re.match(r"[A-Za-z]{3}\d{1,2}", lines[i + 1]):
            description = lines[i + 1].strip()
            i += 1  # Skipping description line in next iteration

        # Determining direction
        if trans_type.lower() in ["deposit", "payrolldep.", "pointofsalerefund"]:
            amount_signed = abs(amount)
        else:
            amount_signed = -abs(amount)

        records.append({
            "Date": date,
            "Transaction_Type": trans_type,
            "Amount": amount_signed,
            "Balance": balance,
            "Description": description
        })
    i += 1

df = pd.DataFrame(records)
print(df)
```

```
     Date     Transaction_Type  Amount  Balance  \
0   Apr19  Pointofsalepurchase   -3.30   194.28
1   Apr19  Pointofsalepurchase  -12.81   181.47
2   Apr21  Pointofsalepurchase   -3.30   178.17
3   Apr22           Withdrawal -113.00    65.17
4   Apr22           Withdrawal  -45.00    20.17
..    ...                  ...     ...      ...
60  May16  Pointofsalepurchase   -3.30   994.70
61  May16              Deposit   15.00  1009.70
62  May16  Pointofsalepurchase   -3.30  1006.40
63  May16  Pointofsalepurchase   -3.30  1003.10
64  May16  Pointofsalepurchase -710.00   293.10

                     Description
0             AposPres/5Gm6P6Hrln
1   AposDollarama#386EtobicokeONCA
2             AposPres/5Gn11Nqq6B
3    15483976FreeInteracE-Transfer
4    16232506FreeInteracE-Transfer
..                             ...
60            AposPres/5H1L9Fj8JP
61   80431671FreeInteracE-Transfer
62            AposPres/5H1M9Jfc68
63            AposPres/5H1N4L5G5P
64  OposRemitly*Gf5A6VancouverBCCA

[65 rows x 5 columns]
```

SO FAR:

- Used pdfplumber to extract raw text from text-based bank statements
- Manually filtered out non-transactional content (e.g., headers, footers)
- Built a custom parser to detect transaction lines and descriptions
- Created a structured DataFrame with columns: Date, Transaction_Type, Amount, Balance, Description

SPENDING CATEGORIZATION

In [10]:
```python
def categorize(desc):
    desc = desc.lower()

    if any(keyword in desc for keyword in ["ubereat", "mcdonald", "tim", "chai", "shopper
        return "Food & Delivery"

    elif any(keyword in desc for keyword in ["uber", "ttc", "pres", "opos", "trip", "lyft
        return "Transportation"

    elif "remitly" in desc or "transfer" in desc or "creditcard" in desc:
        return "Transfers/Payments"

    elif "payroll" in desc or "deposit" in desc:
        return "Income"

    else:
        return "Other"
df["Category"] = df["Description"].apply(categorize)
```

Used keyword-matching logic to assign categories such as:

- Food & Delivery
- Transportation
- Transfers/Payments
- Income
- Other

SPENDING BY CATEGORY

In [11]:
```
# Filtering only spending
spending = df[df["Amount"] < 0]

# Grouping and summarizing
summary = spending.groupby("Category")["Amount"].sum().abs().sort_values(ascending=False)
print("📊 Spending Summary by Category:")
print(summary)
```

```
📊 Spending Summary by Category:
Category
Transfers/Payments    1806.29
Transportation         862.07
Other                  124.39
Food & Delivery        100.78
Name: Amount, dtype: float64
```

OVERSPENDING ALERTS

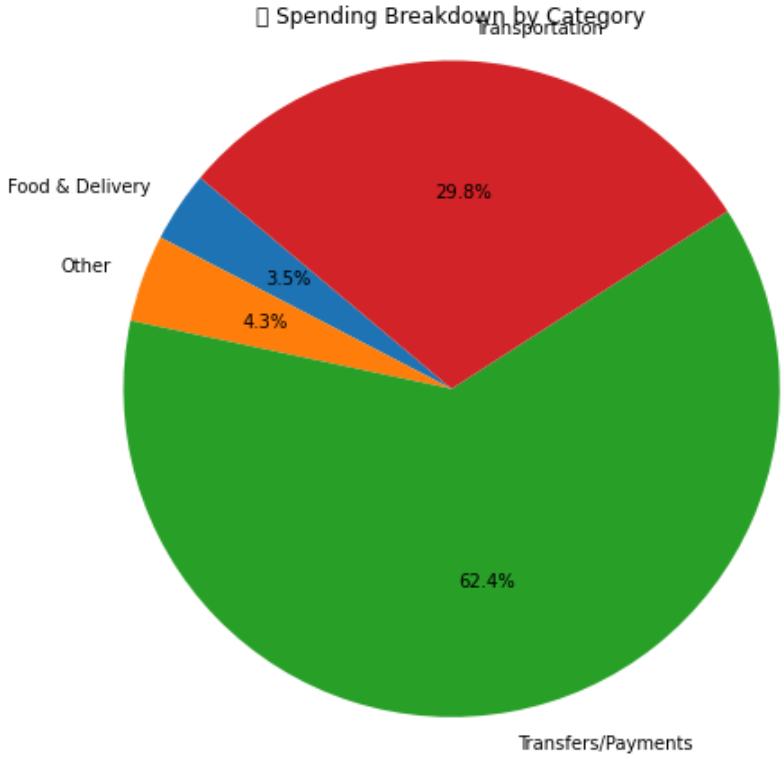
In [13]:
```
limits = {
    "Food & Delivery": 150,
    "Shopping": 100,
    "Transfers/Payments": 1000
}

for category, total in summary.items():
    if category in limits and total > limits[category]:
        print(f"⚠️ Overspent on {category}: ${total:.2f} (Limit: ${limits[category]})")
```

```
⚠️ Overspent on Transfers/Payments: $1806.29 (Limit: $1000)
```

VISUALIZATIONS

In [15]:
```
import matplotlib.pyplot as plt

# Filtering for only expenses (Amount < 0)
spending = df[df["Amount"] < 0]

# Grouping by category
category_summary = spending.groupby("Category")["Amount"].sum().abs()

# Plot
plt.figure(figsize=(8, 6))
plt.pie(category_summary, labels=category_summary.index, autopct='%1.1f%%', startangle=14
plt.title("💸 Spending Breakdown by Category")
plt.axis('equal')
plt.tight_layout()
plt.show()
```

```
C:\Users\alish\anaconda3\lib\site-packages\matplotlib\backends\backend_agg.py:240: Runt
imeWarning: Glyph 128184 missing from current font.
  font.set_text(s, 0.0, flags=flags)
C:\Users\alish\anaconda3\lib\site-packages\matplotlib\backends\backend_agg.py:203: Runt
imeWarning: Glyph 128184 missing from current font.
  font.set_text(s, 0, flags=flags)
```

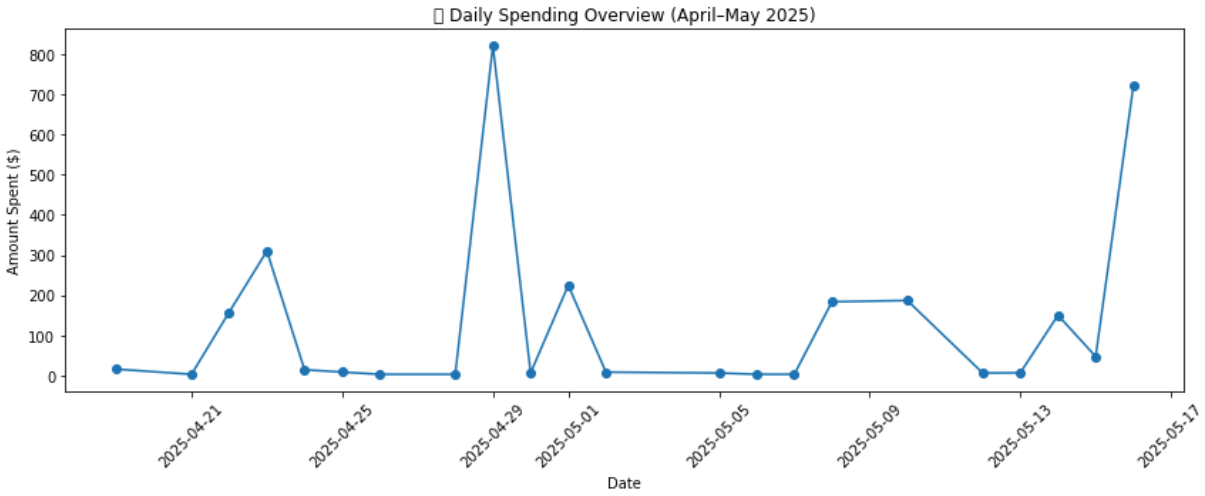


In [16]:
```
from datetime import datetime

# Adding year to ensure full date parsing
def convert_to_date(d):
    try:
        return datetime.strptime(d + " 2025", "%b%d %Y")
    except:
        return None  # for rows like 'ClosingBalance'

df["Parsed_Date"] = df["Date"].apply(convert_to_date)
```

In [17]:
```
# Filtering for only expenses
spending = df[df["Amount"] < 0]

# Grouping by date
daily_summary = spending.groupby("Parsed_Date")["Amount"].sum().abs().reset_index()
```

In [19]:
```
plt.figure(figsize=(12, 5))
plt.plot(daily_summary["Parsed_Date"], daily_summary["Amount"], marker='o')
plt.xticks(rotation=45)
plt.title("📈 Daily Spending Overview (April–May 2025)")
plt.xlabel("Date")
plt.ylabel("Amount Spent ($)")
plt.tight_layout()
plt.show()
```

```
C:\Users\alish\anaconda3\lib\site-packages\matplotlib\backends\backend_agg.py:240: Runt
imeWarning: Glyph 128200 missing from current font.
  font.set_text(s, 0.0, flags=flags)
C:\Users\alish\antaconda3\lib\site-packages\matplotlib\backends\backend_agg.py:203: Runt
imeWarning: Glyph 128200 missing from current font.
  font.set_text(s, 0, flags=flags)
```



INSIGHTS

- Highest spending category: Transportation
- Multiple small purchases from Pres/Uber/Presto indicating daily transport use (as the user is a student and part-time worker this is valid)
- Peaks in spending correspond to large withdrawals/transfers