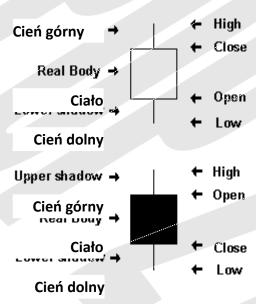
## **OPIS PROJEKTU**

Wykresy giełdowe kursu akcji stanowią podstawową informację o cenie i jej zmianach w czasie. W celu ich analizy, a następnie przewidywań o dalszym zachowaniu sie kursu akcji



Rys. 1. Zasady rysowania świecy.

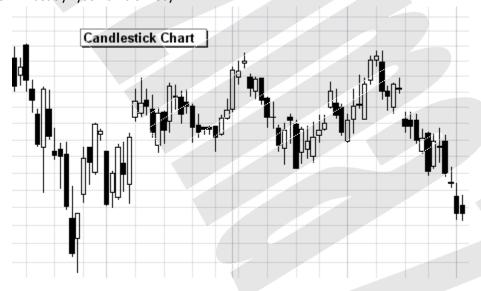
opracowane zostały metody analizy tych wykresów. Jednym ze sposobów, jest przedstawianie danych graficznie, za pomocą tzw. świec japońskich. Święcę taką można narysować posiadając 4 podstawowe dane giełdowe z danego okresu:

- cena otwarcia z badanego okresu (Open),
- cena zamknięcia z badanego okresu (Close),
- najniższa cena z badanego okresu (Low),
- najwyższa cena z badanego okresu (High).

Najniższa i najwyższa cena określają długość "cienia" świecy, natomiast cena otwarcia i zamknięcia określają rozmiar "ciała" świecy.

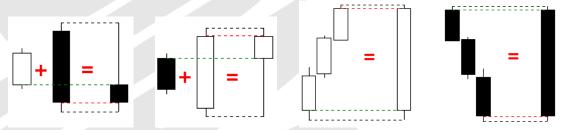
Przykład świecy pokzano na rysunku Rys.1.

Przykład wykresu pokazano na rysunku Rys.2.



Rys. 2. Przykładowy wykres świecowy.

W przypadku, gdy posiadamy dane z pewnego okresu (np. dniowe) a chcemy wykreślić dane dla innego wykresu czsowego, (np. dwniowe, tygodniowe) to należy wykonać łączenie świec na wykresie. Schemat łączenia świec predstawiono na rys. 3. Jeżeli trend jest spadający (najpierw biała, potem czarna świeca), to nowe ciało świecy rozciąga się od otwarcia z dnia pierwszego do zamknięcia dnia drugiego i odwrotnie w przypadku trendu wzrostowego. Najniższa i największa cena brana jest z całego okresu. Na tych saych zasadach można łączyć wiele świec.



Rys. 3. Przykłady łączenia świec.

Do wykonania zadania dostanesz pliki z danymi giełdowymi cen akcji w danym okresie, które są zapisane w pliku tekstowym, o następującym formacie: data, cena otwarcia, maksimum, minimum, cena zamknięcia, poprawiona cena zamknięcia, wolumen. Poprawiona cena zamknięcia i wolumen nie są używane w programie.

# Wygląd pliku z dnaymi:

Date, Open, High, Low, Close, Adj Close, Volume

2017-06-05,6305.470215,6310.620117,6292.149902,6295.680176,6295.680176,1739820000 2017-06-06,6281.879883,6304.209961,6269.870117,6275.060059,6275.060059,1889690000

#### ZADANIE

Napisz program, który rysuje wykresy świecowe z danych giełdowych. Program ma generować wykres świecowy dla danych giełdowych (rysowana za pomocą znaków tekstowych, np. "\*" albo "[]" to ciało białej świecy a "X" albo "#" to ciało czarnej, "|" to cień) i zapisywać wykres do pliku tekstowego. Określ rozmiar takiego wykresu w pliku (np. 400 znaków w linii, 100 linii) tak, żeby wykres był czytelny. (p.s. oglądaj plik "bez zawijania wierszy"). Ze względu na określony rozmiar wykresu, dane musza zostać przeskalowane i zdyskretyzowane, tak aby się mieściły na wykresie.

Program ma wyświetlać menu i pozwalać na "zwężenie" wykresu, tj. wykreślenie, na podstawie wejściowych danych dniowych, dancyh co podany zakres, (np. co 2 dni "co tydzień), dla dowolnej liczby dni podanej przez użytkownika, zaczynając od downolnej daty. W menu ma być opcja wyboru pliku z danymi wejściowymi.

Zawartość plików do zadania powinny być dołączone do tej wiadomości, poniżej Należy to skopiować i stworzyć sobie odpowiednie pliki. W przypadku problemów skontaktuj się z prowadzącym, który zadanie wydał. Pliki są cztery, o nazwach: "AAPL", "INTC", "MSFT", "NTDOY".

- [1] https://pl.wikipedia.org/wiki/świece japońskie
- [2] http://stockcharts.com/school/doku.php?id=chart school:chart analysis:introduction to candlesticks

#### PLIK AAPL

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#### PLIK INTC

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## **AUTOR**

Dr inż. Maciej Wróbel, Katedra Metrologii i Optoelektroniki (2017)