

Code B: Hack **Bloomberg**

*Typo... what we really mean is “Bloomberg Hackathon”

Why are you here?

To have fun!

(And eat free food, get free swag, win cool prizes!!!)



A: A simulation of an Exchange where people can Write Code that Trades Stocks

Q: What kind of hackathon we talkin 'bout here?

- Why?
 - a) **Bloomberg** is a perfect marriage of finance and software
 - b) Everyone associates finance with trading stocks (accessibility)
 - c) An Exchange requires writing **difficult** software that performs trades in a **timely** manner on the best **quality** securities.
 - d) We, the organizers, love to write server software in our free time

***** No prior financial knowledge is needed!**

(And no, it will NOT help)

Cool, so how does it work?

- There will be securities on the exchange
- You will own cash
- You can post BIDs on the exchange
 - How much are you willing to pay for a number of shares of a security
 - Must have enough cash
- You can also post ASKs
 - How much do you want for each of a number of shares of a security
 - Must have enough shares

Bids and Asks?

Example 1:

BID: 10 shares
of MSFT at \$57

ASK: 10 shares
of MSFT at \$57



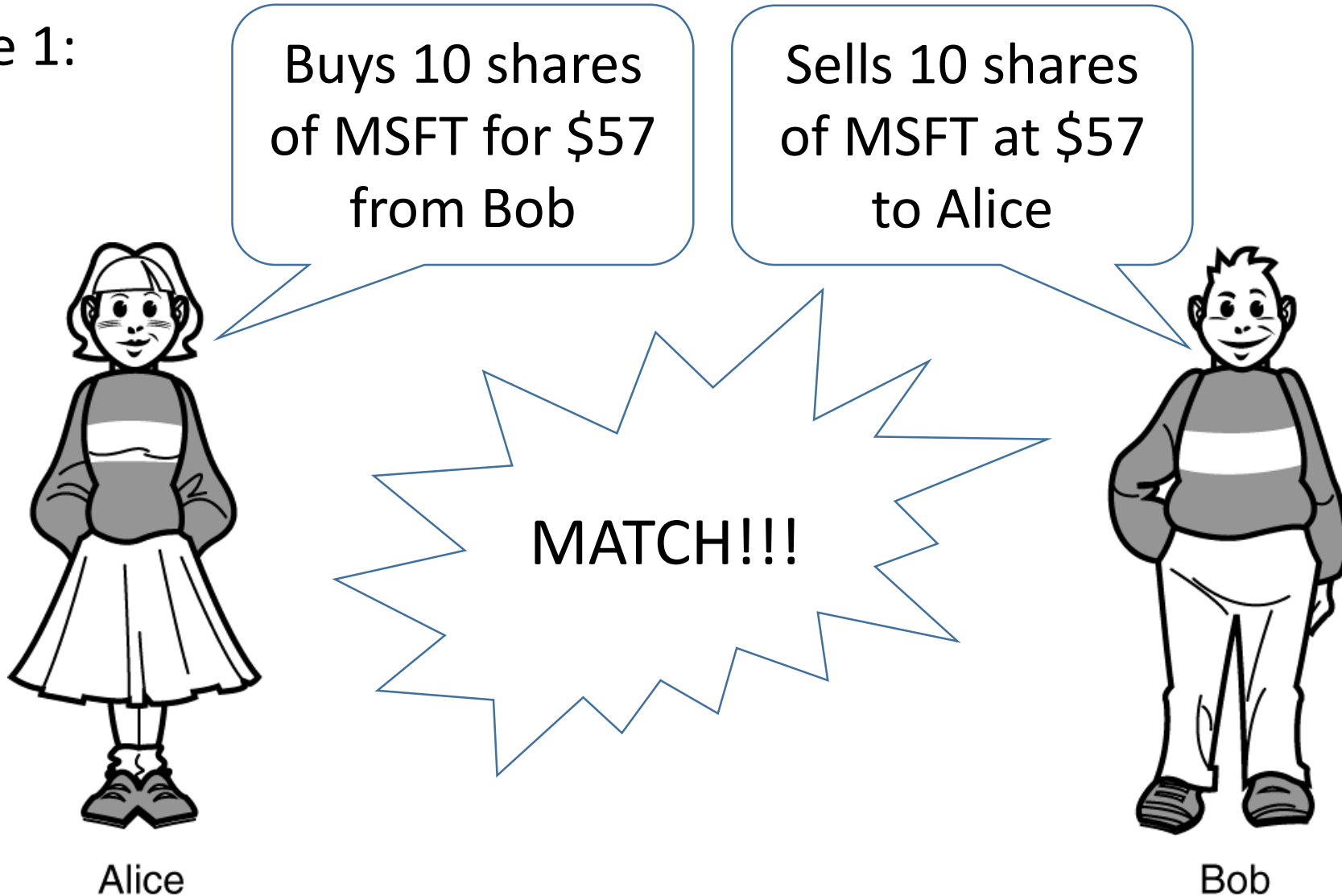
Alice



Bob

Bids and Asks?

Example 1:



Bids and Asks?

Example 2:



Alice

BID: 100 shares
of AAPL \$104

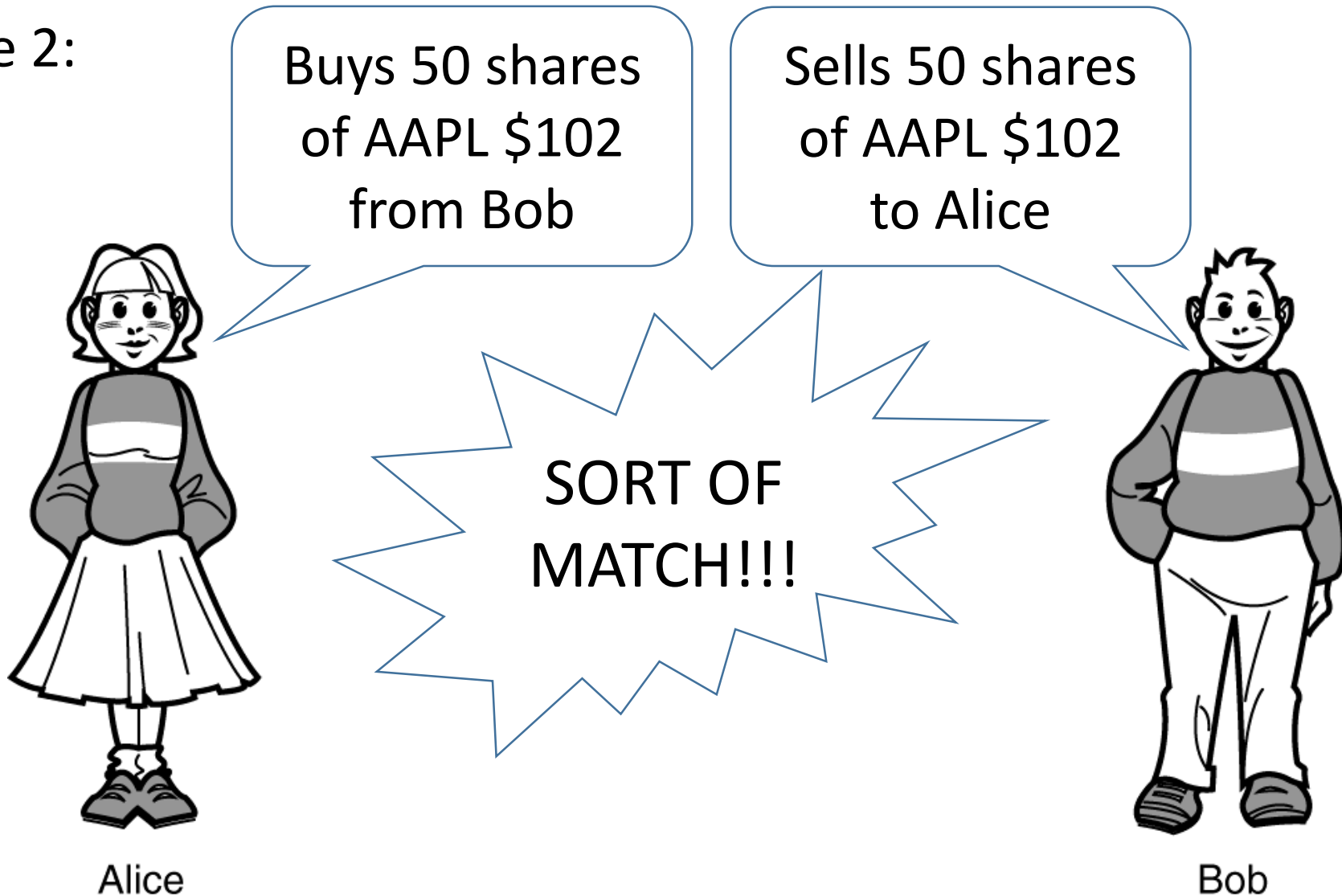
ASK: 50 shares
of AAPL \$100



Bob

Bids and Asks?

Example 2:



Bids and Asks?

Example 3:

BID: 1,000
shares of
GOOGL \$530



Alice

ASK: 1,000
shares of
GOOGL \$500



Eve

ASK: 1,000
shares of
GOOGL \$550



Bob

Bids and Asks?

Example 3:

Buys 1,000
shares of GOOGL
\$515 from Eve

Sells 1,000
shares of GOOGL
\$515 to Alice

No shares are
sold 😞



Alice



Eve



Bob

SORT OF
MATCH!!!

Bids and Asks?

Example 4:

BID: 300 shares
of XOM \$104



Alice

ASK: 150 shares
of XOM \$100



Eve

ASK: 150 shares
of XOM \$104



Bob

Bids and Asks?

Example 4:

Buys
150 shares of XOM
\$102 from Eve &
150 shares of XOM
\$104 from Bob

Sells 150 shares
of XOM \$102 to
Alice

Sells 150 shares
of XOM \$104 to
Alice



Alice

SORT OF
MATCH!!!



Eve

SORT OF
MATCH!!!



Bob

Bids and Asks?

Example 5:

BID: 10 shares
of AAPL \$100

ASK: 10 shares
of AAPL \$75



Eve

Bids and Asks?

Example 5:

Buys 10 shares
of AAPL \$100
from someone

Sells 10 shares
of AAPL \$75
to someone

Eve

Eve loses
\$250!!!

Make sure your
BIDs are below
your ASKs!!!
The market will
NOT check for you!

More exposition...

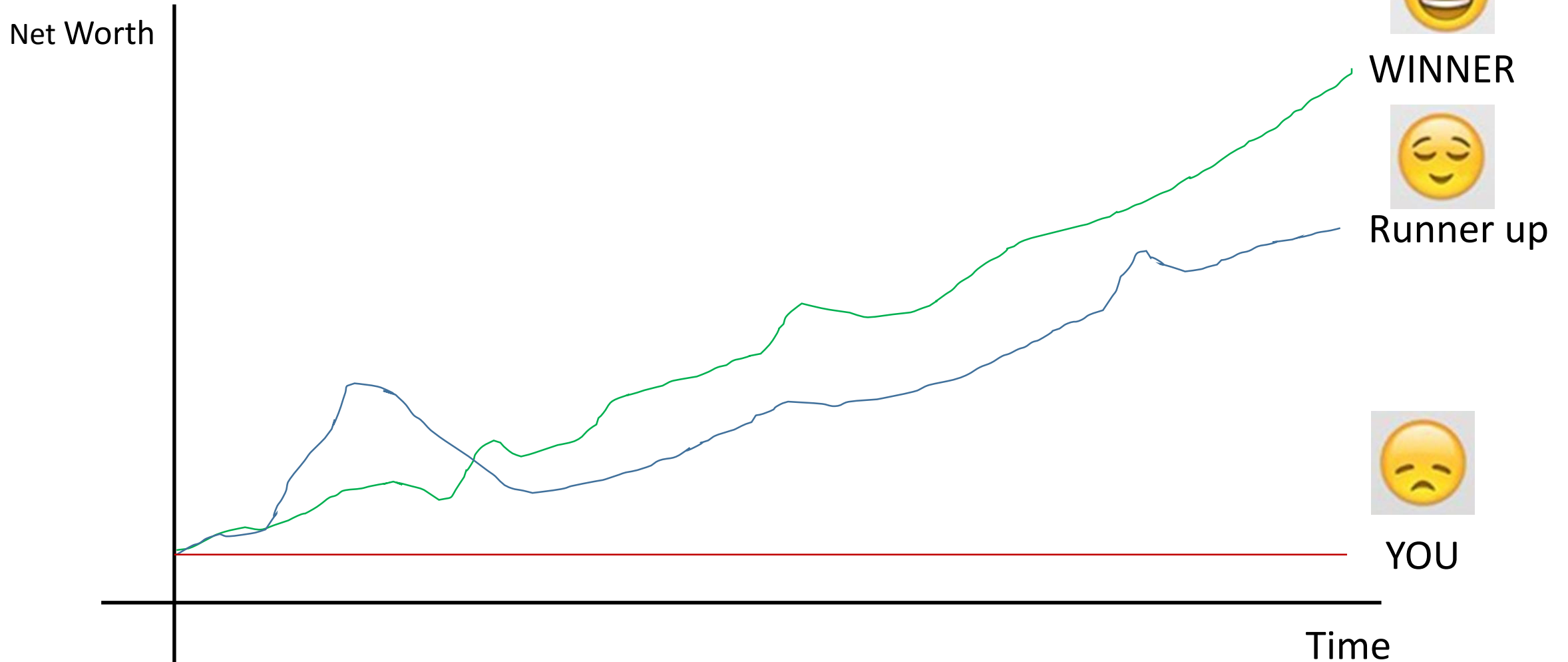
- The exchange will always post (unfair) BIDs and ASKs for all securities
- If a BID and ASK price overlap, a trade is made
 - If your bid trades, your other bids will be withdrawn if you lack cash for them
- You are worth your total cash plus the valuation of all shares you own
 - Shares of a security are influenced by trades on the market
 - Exchange BID & ASK prices moves as valuation moves

What if I buy something way above valuation?  or 

 You just seriously overpaid, dude

 It's not all bad, the valuation just majorly increased





I think I will just keep my cash forever!







Fine, I will just not sell anything then



Ok what about Securities, which do I trade?

- The dividend payout varies with the net worth of a company
 - The net worth of a company is a predetermined curve
 - That means trades will not effect the dividend payout per share
- Ok lets talk portfolio diversification... Good  or bad ?
 -  Much harder to make one bad bet
 - More likely to find a buyer for what you have
 -  You will end up with bad securities (Can you figure out the curves?)
 - Easier to sell off one thing everyone wants

Ok just give me the answer... what do I do?

- Well, in the long run the value a share is $\frac{a}{1-r}$ where a is the initial dividend payout and r is the decrease factor of the dividend
- Its worth more if the net worth keeps increasing
- Its worth even more if someone is BIDDing for more on the market
- Ok should ask more  or  less than that long run value.
 -  Cash on hand will allow quicker buys for something with max dividends
 - Allows for less risk in case the curve dips
 -  The cake is a lie

Questions?