

יסודות – עצמים תחילה

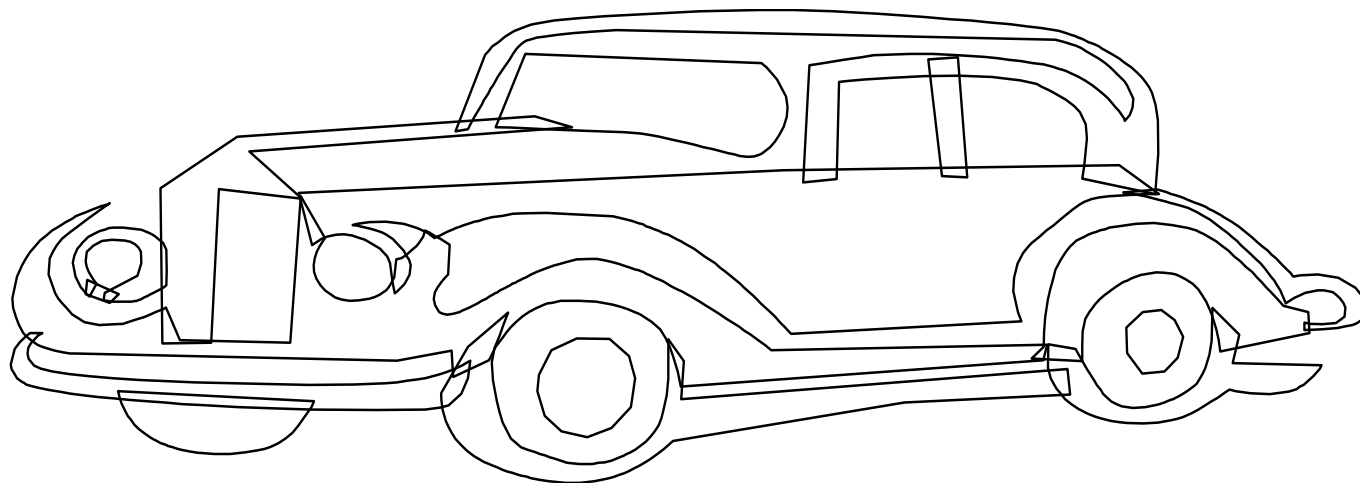


כנס מורי מדעי המחשב, תשס"ז

עצמים תחילה – למה?

- לתלמידים- לימוד חומר חדש, לא מעבר
- "משבר התוכנה"
- להתאים את המכונות לאדם ולא את האדם למכונות.
- ילדים חושבים בעצמים:
 - מושגים מוחשיים (עט, מחשב, עץ, אדם, מזלג וכו')
 - מושגים מופשטים (ציון, תפקיד, רעיון, פגישה, הסכם, חוזה וכו')
 - מכנים משותפים, שיוכים (אופניים, מכוניות, מטוסים, רכבות הנם כלי תחבורה. תפוז, אגס, תפוח, בננה הנם פירות וכו').

עצמים תחילה – למה?



עצמים תחילה – איך?

□ עבודה עם מחלקות מוכנות

■ Turtle

■ Bucket

□ כתיבת מחלקות

המחלקה Cards

```
Card
```

```
private string name;
```

```
Card()
```

```
Card(string name)
```

```
void SetName(string name)
```

```
string GetName()
```

```
string ToString()
```

```
class Card
```

```
{
```

```
    private string name;
```

```
    public Card()
```

```
    {
```

```
        this.name="";
```

```
    }
```

```
    public Card(string name)
```

```
    {
```

```
        this.name = name;
```

```
    }
```

```
    public void SetName(string name)
```

```
    {
```

```
        this.name = name;
```

```
    }
```

```
    public string GetName()
```

```
    {
```

```
        return this.name;
```

```
    }
```

```
    public override string ToString()
```

```
    {
```

```
        return ("Happy birthday " + this.name);
```

```
    }
```

```
}
```

המחלקה Cards

המחלקה Cards

```
static void Main(string[] args)
{
    Card birthCard = new Card();
    Console.Write("Card with no name: ");
    Console.WriteLine(birthCard.ToString());
    Console.WriteLine();
    Console.WriteLine("What is your name?");
    string name = Console.ReadLine();
    birthCard = new Card(name);
    Console.Write("Card with a name: ");
    Console.WriteLine(birthCard);
    Console.ReadLine();
}
```

המחלקה Locker

| |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>Locker</code> |
| <code>int key;</code> |
| <code>Locker()</code> <code>Locker(int key)</code> |
| ----- <code>void SetKey(int key)</code> <code>int GetKey()</code> <code>bool Open()</code> <code>bool CanBeKey()</code> <code>string ToString()</code> |


```
class Locker
{
    private int key;
    public Locker()
    {
        this.key = 132;
    }
    public Locker(int key)
    {
        if (CanBeKey(key))
            this.key=key;
        else this.key =132;
    }
    public void SetKey(int key)
    {
        if (CanBeKey(key))
            this.key = key;
        else this.key =132;
    }
    public int GetKey()
    {
        return this.key;
    }
    ...
}
```

המחלקה Locker

המחלקה Locker

```
...
public bool CanBeKey()
{
    return (this.key/100+this.key%10==this.key/10%10);
}
public bool CanBeKey(int key)
{
    return (key / 100 + key % 10 == key / 10 % 10);
}
public bool Open(int key)
{
    return (this.key==key);
}
public override string ToString()
{
    return this.key.ToString();
}
} // class Locker
```

המחלקה Locker

```
static void Main(string[] args)
{
    Locker locker = new Locker(); //Default Ctor
    Console.WriteLine(locker);
    locker.SetKey(426); //Can not be a key;
    Console.WriteLine(locker);
    locker.SetKey(385); // A new key
    Console.WriteLine(locker);
    Console.ReadLine();
}
```

המחלקה CardByAge

```
CardByAge
```

```
private string name;  
private int age;
```

```
CardByAge ()
```

```
CardByAge (string name)
```

```
CardByAge (string name,  
           int age )
```

```
void SetName (string name)
```

```
string GetName ()
```

```
void SetAge (int age)
```

```
int GetAge ()
```

```
string ToString ()
```

המחלקה CardByAge

```
class CardByAge
{
    private string name;
    private int age;
    public CardByAge()
    {
        this.name="";
        this.age = 0;
    }
    public CardByAge(string name)
    {
        this.name = name;
        this.age = 0;
    }
    public CardByAge(string name, int age)
    {
        this.name = name;
        this.age = age;
    }
    ...
}
```

המחלקה CardByAge

```
...  
public void SetName(string name)  
{  
    this.name = name;  
}  
public string GetName()  
{  
    return this.name;  
}  
public void SetAge(int age)  
{  
    this.age = 0;  
    if(age>0)  
        this.age = age;  
}  
public int GetAge()  
{  
    return this.age;  
}  
...
```

המחלקה CardByAge

...

```
public override string ToString()
{
    string st = "Happy birthday " + this.name+ ".";
    if(this.age==0)
        return (st);
    if(this.age<10)
        return (st + " you turn to be soooooo big");
    if (this.age < 60)
        return (st + " 20"+" -;(" דע "+"100 "+" כ
else return (st + " 120"+ " ;(" דע
{
{// Class CardByAge
```

המחלקה CardByAge

```
static void Main(string[] args)
{
    Console.WriteLine("What is your name and age?");
    string name1 = Console.ReadLine();
    int age = int.Parse(Console.ReadLine());
    CardByAge ageCard = new CardByAge(name1, age);
    Console.WriteLine(ageCard);
    Console.ReadLine();
}
```


המחלקה Rectangle

```
Rectangle
```

```
int x;  
int y;  
int height;  
int width;  
ConsoleColor color;
```

```
Rectangle()
```

```
Rectangle(int x, int y,  
          int height, int width,  
          ConsoleColor color)
```

```
Set /Get ...
```

```
void MoveTo(int x, int y)  
void Resize(int height, int width)  
void Draw()
```

המחלקה Rectangle

```
class Rectangle
{
    private int x;
    private int y;
    private int height;
    private int width;
    private ConsoleColor color;

    public Rectangle()
    {
    }
    public Rectangle(int x, int y, int height,
                    int width, ConsoleColor c)
    {
        this.x = x;
        this.y = y;
        this.height = height;
        this.width = width;
        this.color = c;
    }
}
```

המחלקה Rectangle

```
public int GetX()  
{  
    return x;  
}  
public int GetY()  
{  
    return y;  
}  
public int GetHeight()  
{  
    return height;  
}  
public int GetWidth()  
{  
    return width;  
}  
public ConsoleColor GetColor()  
{  
    return color;  
}
```

המחלקה Rectangle

```
public void SetX(int x)
{
    this.x = x;
}
public void SetY(int y)
{
    this.y = y;
}
public void SetHeight (int h)
{
    this.height = h;
}
public void SetWidth (int w)
{
    this.width = w;
}
public void SetColor(ConsoleColor c)
{
    this.color= c;
}
```

המחלקה Rectangle

```
public void MoveTo(int x, int y)
{
    this.x = x;
    this.y = y;
}
public void Resize(int h, int w)
{
    this.height = h;
    this.width = w;
}
```

```
public void DrawAtConsole()
{
    Console.ForegroundColor = this.Color;
    for (int x = this.x; x < this.width + this.x; x++)
    {
        Console.CursorLeft = x;
        Console.CursorTop = this.Y;
        Console.Write("*");

        Console.CursorLeft = x;
        Console.CursorTop = this.Y + this.height - 1;
        Console.Write("*");
    }
    for (int y = this.Y; y < this.height + this.Y; y++)
    {
        Console.CursorLeft = this.X;
        Console.CursorTop = y;
        Console.Write("*");

        Console.CursorLeft = this.X + this.width - 1;
        Console.CursorTop = y;
        Console.Write("*");
    }
    Console.WriteLine();
    Console.WriteLine();
} // class Rectangle
```

המחלקה Rectangle

המחלקה Rectangle

```
static void Main(string[] args)
{
    Rectangle r = new Rectangle(2, 5, 10, 5, ConsoleColor.Red);
    r.Draw();
    r.MoveTo(10, 10);
    r.Resize(7, 3);
    Console.ReadLine();
    r.DrawAtConsole();
}
```

לשאלות

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